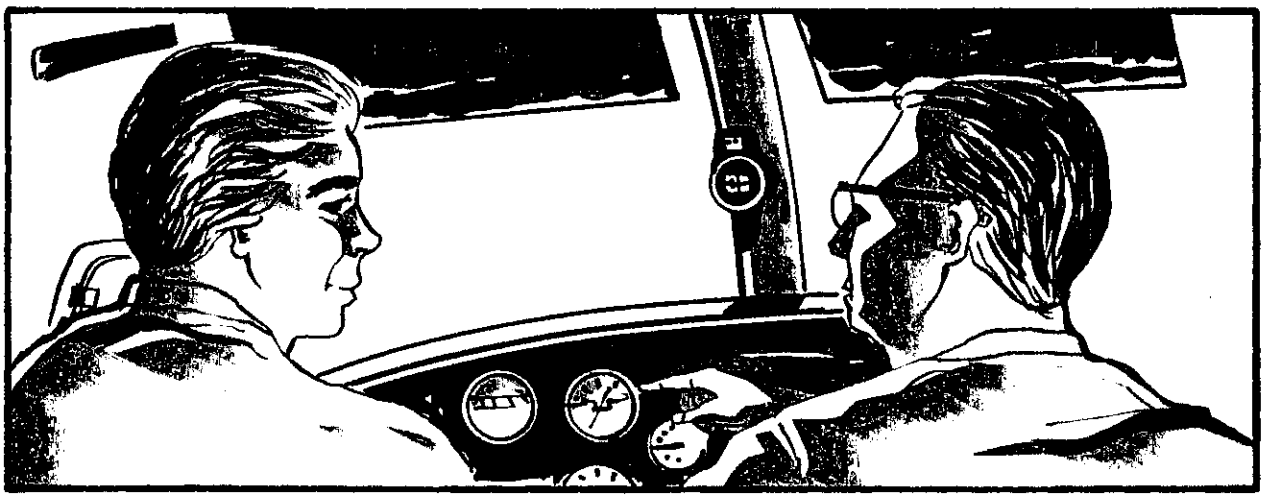
AC 61-72B

FLIGHT INSTRUCTOR AIRPLANE

Written Test Guide



REVISED 1979

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

FLIGHT INSTRUCTOR
AIRPLANE
WRITTEN TEST GUIDE

REVISED 1979

U.S. Department of Transportation
Federal Aviation Administration
Office of Flight Operations

PREFACE

This written test guide was prepared by the Office of Flight Operations of the Federal Aviation Administration to help applicants meet the aeronautical knowledge requirements for the Flight Instructor Certificate with an Airplane Rating. It supersedes AC 61-72A, Flight Instructor-Airplane Written Test Guide, dated 1977.

This guide briefly explains the need for comprehensive instruction and describes the aeronautical knowledge requirements for certification as an airplane flight instructor. Also included is information on the source material that can be used to acquire essential knowledge in the various subject areas. Further, it provides instructions for taking the official FAA written test, and includes test items that are representative of those found in the Flight Instructor-Airplane written test book. The test items and choices of answers in this guide are based on regulations, principles, and practices that were valid at the time this publication was printed. The test items on the official written tests are continually updated; consequently, they may vary somewhat from those contained herein.

This guide is directed primarily toward the aeronautical knowledge requirements for the certification of flight instructors. Guidance relating to the fundamentals of instructing is provided in separate publications and except for brief references is not included in this guide.

The FAA does not supply the correct answers to questions included in this guide. Students should determine the answers by research and study, by working with instructors, or by attending ground schools. The FAA is in no way responsible for the contents of commercial reprints of this publication nor the accuracy of answers they may list.

Comments regarding this publication should be directed to the U.S. Department of Transportation, Federal Aviation Administration, Flight Standards National Field Office, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

CONTENTS

PILOT TRAINING

The Role of the Flight Instructor

All pilot training is directed toward developing competent, efficient, and safe pilots. The more complete a student's understanding of theory and principles, the easier it will be for that person to become a safe, competent pilot. It has long been recognized that ground instruction and flight training go hand in hand. Each complements the other, resulting in a training program which is more meaningful and comprehensive.

Generally, pilots learn by one of two methods. Some learn by rote (by memory alone without investigating fundamental principles), while others acquire knowledge and understanding of basic procedures and techniques and apply these concepts to the various piloting operations. The latter means of learning is by far the more effective method. Effective pilot training is based on the fact that knowledge and understanding of principles, along with skill, are essential to safety in flight.

The keystone of the present-day training concept is the flight instructor--a professional who assumes full responsibility for all phases of a student pilot's required ground and flight training.

How does one become a skilled and effective flight instructor? Although some people possess, to a greater degree than others, those traits that are desirable in an instructor, no one is born a natural instructor. Competent flight instructors become so through study, training, experience, and conscientious effort. Probably more than any other single factor, the flight instructor's own attitude toward flight instruction determines how well the job of teaching is done.

The flight instructor must, of course, be fully qualified as a pilot. Qualifications go far beyond those required for certification as a pilot, however, if success as a professional flight instructor is to be achieved. The instructor must have in addition to pilot skill, a thorough understanding of how learning occurs and how to employ teaching methods that best foster learning. To teach effectively and produce competent, efficient, and safe pilots, the instructor should practice professionalism in the teaching process.

To provide instruction of professional quality, the flight instructor should thoroughly understand all aspects of aeronautical subjects and their relationship to various pilot operations--not just be able to answer the random test items in the certification written test by rote. There can be no substitute for diligent study to attain the essential knowledge, for unremitting efforts to develop competence, or for continuous review and practice to retain that knowledge and proficiency.

The flight instructor is considered to be an authority on aeronautical matters and is the expert to whom students, and many experienced pilots, submit questions concerning regulations, technical matters, and current operating procedures and techniques. Obviously, to responsibly answer such questions, or resolve related problems, the flight instructor should have sound knowledge of the various aviation subjects.

Even after the new flight instructor has gained the basic knowledge and skills and has been certificated, it is imperative that a continuous effort be made to improve the quality of instruction and to remain abreast of the latest developments in aviation products, regulations, procedures, and practices. To enhance professionalism in the field of flight instruction, the instructor should maintain a current technical library to provide a ready source for reference and research. By obtaining study materials listed in this guide that are beneficial and pertinent to the preparation for initial certification, the prospective flight instructor will be starting a personal aeronautical library that will be useful throughout a career in pilot training.

In addition to giving instruction during flight, the certificated flight instructor is authorized to conduct the required ground instruction for pilot and instructor applicants. In exercising this privilege, the instructor carries the responsibility for providing comprehensive training in the appropriate subjects and for ensuring that the trainees acquire sufficient knowledge and understanding of the subjects to qualify for pilot or instructor certification.

FLIGHT INSTRUCTOR CERTIFICATION

Requirements for Training and Testing

To be eligible for an airplane flight instructor certificate, a person must hold a commercial or airline transport pilot certificate with an airplane rating and an instrument rating.

Further, regulations require that an applicant for a flight instructor certificate satisfactorily complete a course of instruction in the fundamentals of instructing, including the subjects of how people learn, teaching and evaluating students, and the development of courses and lesson plans. The possession of a teacher's certificate authorizing employment as a teacher in a public school system, or status as an instructor in a college or university, may be accepted as evidence of having received training in the teaching and learning process.

The certification process requires that the applicant pass the FAA's Fundamentals of Instructing (FOI) Written Test to ensure that the person possess adequate knowledge of teaching methods as they apply to pilot instruction. Although applicants holding a teacher's certificate or status as an instructor in a college or university are credited with having received training in teaching methods, they are not exempt from taking the FOI written test.

If the applicant already holds a valid FAA Flight or Ground Instructor Certificate and is applying for an instructor certificate other than that held, or for the addition of a rating to the certificate, that person need not take the FOI test again.

In addition to the requirement for the applicant to be trained and tested in teaching methods, the applicant for a Flight Instructor-Airplane Certificate is required to have received and logged ground instruction from an authorized ground or flight instructor in all of the subjects in which ground instruction is required for a private and commercial pilot certificate. To ensure that adequate knowledge of those subjects has been acquired, the instructor applicant must pass the FAA's Flight Instructor-Airplane (FIA) Written Test. Those subjects are outlined in this study guide.

It is not necessary, however, to take the Fundamentals of Instructing Test on the same day as the Flight Instructor-Airplane Written Test, nor is it important which of these tests is taken first.

Finally, after the prescribed written tests have been passed, the certification process requires the applicant to pass a practical test in which competency to instruct students during flight must be demonstrated. This practical test must be satisfactorily completed within 24 months after the date the written tests were passed.

The written tests are administered by all FAA General Aviation District Offices (GADO), Flight Standards District Offices (FSDO), and some Air Carrier District Offices (ACDO) and some Flight Service Stations (FSS). In addition, certain qualified individuals have been designated as written test examiners to administer the FAA written tests. The practical (or flight) test can be administered by an FAA Inspector or an individual specifically designated as a Flight Instructor Examiner (FIE).

As a convenience to the prospective flight instructor, those portions of the present Federal Aviation Regulations pertinent to the general eligibility, flight proficiency, and aeronautical knowledge requirements for the instructor certificate have been included in this guide. Applicants should be aware, however, that regulations are subject to change. Any question regarding the currency of these regulation excerpts may be checked with the appropriate FAA Office.

Subject Matter of Written Tests

The Fundamentals of Instructing Written Test and the Flight Instructor-Airplane Written Test are very comprehensive because, to be effective, they must test an applicant's knowledge in many subject areas.

The test on Fundamentals of Instructing contains items involving subjects such as the Learning Process, Elements of Effective Teaching, Student Evaluation, Quizzing and Testing, Course Development, Lesson Planning, and Classroom Instructing Techniques. These subject areas are extensively discussed in AC 60-14, Aviation Instructor's Handbook, which may be purchased from the Superintendent of Documents, U.S. Government Printing Office. The Fundamentals of Instructing Written Tests contain 60 test items and 4 hours are allowed for completion.

As stated earlier, the required aeronautical knowledge areas of the Flight Instructor-Airplane Written Test include all subjects in which ground instruction is required for private and commercial airplane pilot ratings.

The test items deal with specific subjects such as basic navigation, radio navigation, radio communications, meteorology, aerodynamics, airplane performance, Federal Aviation Regulations, and airplane and powerplant operation. The written test evaluates the applicant for adequate knowledge and grasp of theory to assure that instruction in the specific subject matter will accomplish the goal of each lesson. Many questions require the ability to combine and interrelate knowledge in two or more specific subject areas.

The test items included in this guide are representative of those found in the Flight Instructor Written Test. It must be reemphasized, however, that learning to answer these items solely by rote will not ensure sufficient knowledge of the subjects, since tests of this nature are merely a sampling of one's knowledge. To acquire complete understanding of the pertinent subjects, the applicant is strongly urged to use the study outline provided herein and thoroughly study the material in referenced publications--then use the test items to review and evaluate one's understanding of the subjects. The Flight Instructor-Airplane Written Tests contain 100 test items and 5 hours are allowed for completing this test.

All test items are the objective, multiple choice type, and can be answered by the selection of a single response. This type of test conserves the applicant's time, permits greater coverage of subject mater, minimizes the time required for scoring, and eliminates subjective judgment in determining the applicant's grade.

Each item is independent of other test items; that is, a correct response to one test item does not depend upon, or influence, the correct response to another.

Taking the Written Tests

Communication between individuals through the use of words is a complicated process. Since certification tests involve the use of written rather than spoken words, communication between the test writers and the persons being tested may become a difficult matter if care is not exercised by both parties. Consequently, considerable effort is expended to write each test item in a clear, precise manner. Applicants should carefully read the information and instructions given with the tests, as well as the statements in each test item.

Always remember the following when taking the test:

1. There are no "trick" questions. Each statement means exactly what it says. Do not look for hidden meanings. The statement does not concern exceptions to the rule; it refers to the general rule.

2. Carefully read the entire test item, statement, or question before selecting an answer. Skimming and hasty assumptions can lead to a completely erroneous approach to the problem because of failure to consider vital words. Examine and analyze the list of answers or phrases, then select the one that answers the question or completes the statement correctly.

3. Only one of the listed answers given is completely correct. The others may be the result of using incorrect procedures to solve problems, common misconceptions, or insufficient knowledge of the subject. Consequently, many of the incorrect answers may appear to be plausible to those persons whose knowledge is deficient. If the subject matter is adequately understood, the questions should not be difficult to answer correctly.

4. If considerable difficulty is experienced with a particular test item, do not spend too much time on it, but continue with other items which you consider to be less difficult. When all of the easier items are completed, go back and complete those items that were found to be more difficult. This procedure will enable you to use the available time to maximum advantage.

5. In solving problems which require computations or the use of a plotter and computer, select the answer which most nearly agrees with the calculated result. Due to slight differences in navigation computers and small errors that may exist in the measurement of distances, true courses, etc., it is possible that an exact agreement with available answers will not occur. Sufficient spread is provided between right and wrong answers, however, so that the selection of the answer which is more nearly that of the calculated result will be correct, provided correct technique and reasonable care were used in making computations.

Computers and plotters that contain information not directly related to their operation may be used only if that information is obscured by suitable masking material. The use of electronic or mechanical calculators

is subject to the following limitations: (a) prior to, and on completion of the test, the applicant must actuate the "ON/OFF" switch to erase any data stored in memory circuits; (b) tape printout of data, if incorporated in the calculator, must be surrendered to the test monitor; and (c) the use of material containing instructions related to operation of the calculator is not permitted.

Applicants may find that certain test questions involving regulations, ATC procedures, etc., are outdated by very recent changes. In these instances, applicants are given credit for the test item during the period that it takes to distribute a revised question.

To familiarize you with the procedures for taking the official Flight Instructor-Airplane Written Test, samples of the actual General Instructions, Written Test Application, Question Selection Sheet, and answer sheet are provided in this guide.

After completing the test, your answer sheet is forwarded to the Federal Aviation Administration Aeronautical Center in Oklahoma City, for scoring by electronic computers (ADP). Shortly thereafter, you will receive an Airman Written Test Report which not only includes the grade but also lists, in code, the subject areas in which test items were answered incorrectly. Those subject areas can be determined by reference to the List of Subject Matter Codes which accompanies the report. This method provides an essential feedback to you and can be effectively used for further study of the areas in which your knowledge was inadequate.

It must be emphasized here that the total number of subject codes shown on the test report is not necessarily an indication of the total number of test items answered incorrectly. When one or more questions are missed in a given subject area, the code for that subject appears only once on the grade report.

Retesting After Failure

An applicant who fails the written test may not apply for retesting until 30 days after the date the applicant failed the test. In the case of the first failure, however, the person may apply for retesting before the 30 days have expired upon presenting a written statement from an authorized instructor certifying that appropriate ground instruction was given to the applicant and the instructor finds that person competent to pass the test. In addition, the written test report of the previously failed test must be presented at the time of retesting.

RECOMMENDED STUDY MATERIALS

The following lists the essential reference materials developed by the U.S. Department of Transportation, but does not include all the useful material that is available. Other excellent textbooks, audio-visual training aids, and instructional materials produced commercially may be obtained from various bookstores, and fixed-base operators engaged in flight training.

ADVISORY CIRCULARS

FAA Advisory Circulars inform the aviation public in a systematic way of nonregulatory material of interest. Each circular issued is listed numerically within its subject-number breakdown which corresponds to the subject area of the Federal Aviation Regulations. The identification number (i.e., AC 120-1), the change number of the latest change, if any, to the right of the identification number, the title, and the effective date for each circular are shown. A brief explanation of the contents is given for each listing in AC 00-2, Advisory Circular Checklist.

The checklist AC 00-2, available free of charge, lists advisory circulars that are for sale as well as those distributed free of charge by the FAA.

When a price is listed after the description of a circular in the checklist, that circular is for sale by the Superintendent of Documents. When (Sub.) is included with the price, the advisory circular is available on a subscription basis only. After your subscription has been entered by the Superintendent of documents, supplements or changes to the basic document will be provided automatically at no additional charge until the subscription expires. When no price is given the circular is distributed free of charge by FAA.

Request free advisory circulars from:

U.S. Department of Transportation
Publications Section, M 443.1
Washington, D.C. 20590

Persons who want to be placed on FAA's mailing list for future circulars should write to:

U.S. Department of Transportation
Distribution Requirements Section, M 482.2
Washington, D.C. 20590

It is recommended that the flight instructor applicant obtain Advisory Circulars in at least the following subjects:

Subject Number and Subject Matter
00 ---------- General
20 ---------- Aircraft
60 ---------- Airmen
70 ---------- Air Traffic Control and General Operations
140 ----- Schools and Other Certificated Agencies
170 -------- Air Navigational Facilities

AVIATION INSTRUCTOR'S HANDBOOK. AC 60-14. SN 050-011-00072-1. Provides the aviation instructor with comprehensive, accurate, and easily understood information on learning and teaching and relates this information to students. This handbook cancels AC 61-16A, Flight Instructor's Handbook.

FLIGHT TRAINING HANDBOOK. AC 61-21. SN 050-007-00008-1. Provides information and direction in the introduction and performance of training maneuvers for student pilots, pilots who are requalifying or preparing for additional ratings, and for flight instructors.

PILOT'S HANDBOOK OF AERONAUTICAL KNOWLEDGE. AC 61-23. SN 050-011-00051-8. Contains essential, authoritative information used in training and guiding private pilots, and covers most subject areas in which an applicant may be tested. Tells how to use the Airman's Information Manual, the data in FAA-approved airplane flight manuals, and the basic instruments.

PLANE SENSE. AC 20-5. Acquaints the prospective airplane owner with certain fundamentals of owning and operating an airplane.

PRIVATE PILOT WRITTEN TEST GUIDE, AC 61-32. SN 050-011-00075-5. Provides information, guidelines, and sample test items to assist applicants for the Private Pilot Certificate in attaining necessary aeronautical knowledge.

COMMERCIAL PILOT WRITTEN TEST GUIDE, AC 61-71. SN 050-007-00385-4. Reflects current operating procedures and techniques for use of applicants in preparing for the Commercial Pilot-Airplane Written Test.

PILOT'S WEIGHT AND BALANCE HANDBOOK. AC 91-23. SN 050-007-00504-2. Provides an easily

understood text on aircraft weight and balance. It progresses from an explanation of fundamentals to the application of weight and balance principles in aircraft operations.

WAKE TURBULENCE. AC 90-23. Presents information on the subject of wake turbulence and suggests techniques that may help pilots avoid the hazards of wingtip vortex turbulence.

TERRAIN FLYING. AC 91-15. SN 050-007-00147-9. Contains observations, opinions, warnings, and advice from veteran pilots regarding flight over various types of terrain throughout the U.S.

MEDICAL HANDBOOK FOR PILOTS. AC 67-2. SN 050-007-00254-8. An aviation medicine handbook written in pilot's language that provides guidance on when, and when not, to fly. Emphasizes the fact that a good pilot must be physically fit, psychologically sound, and well trained.

AVIATION WEATHER. AC 00-6. SN 050-007-00283-1. Contains information on weather phenomena for pilots and other flight operations personnel whose interest in meteorology is primarily in its application to flying.

AVIATION WEATHER SERVICES. AC 00-45. SN 050-007-00392-7. Supplements AC 00-6, Aviation Weather, in that it explains the weather service in general and the use and interpretation of reports, forecasts, weather maps, and prognostic charts. Is an excellent source of study for pilot certification examinations.

FEDERAL AVIATION REGULATIONS

The FAA publishes the Federal Aviation Regulations to make readily available to the aviation community the regulatory requirements placed upon them. These regulations are sold as individual Parts by the Superintendent of Documents.

The more frequently amended Parts are sold on subscription service (that is, subscribers will receive Changes automatically as issued), while the less active Parts are sold on a single-sale basis. Changes to single-sale Parts will be sold separately as issued.

Information concerning these Changes will be furnished by FAA through its "Status of the Federal Aviation Regulations, AC 00-44."

The suggested Parts for study are:

Part 1, Definitions and Abbreviations.

Part 23, Airworthiness Standards--Normal, Utility, and Acrobatic Category Airplanes.

Part 61, Certification: Pilots and Flight Instructors.

Part 71, Designation of Federal Airways, Area Low Routes, Controlled Airspace and Reporting Points.

Part 91, General Operating and Flight Rules.

Part 135, Air Taxi Operators and Commercial Operators of Small Aircraft.

Part 141, Pilot Schools.

Part 143, Ground Instructors.

NATIONAL TRANSPORTATION SAFETY BOARD PART 830. This publication deals with procedures required in the notification and reporting of accidents and lost or overdue aircraft within the United States, its territories, and possessions. It is free upon request from the National Transportation Safety Board, Publications Branch, Washington, D.C. 20594.

OTHER PUBLICATIONS AND AERONAUTICAL CHARTS

PRACTICAL AIR NAVIGATION. Provides a comprehensive coverage of subjects and areas dealing with navigation whether it be pilotage, dead reckoning, or radio and celestial navigation. Students who understand the material in this textbook will have no trouble with the navigation problems. This textbook, originally developed by CAA (FAA), may be obtained from many book dealers.

AIRMAN'S INFORMATION MANUAL - BASIC FLIGHT INFORMATION AND ATC PROCEDURES. Provides airmen the basic flight information and ATC procedures for use in the National Airspace System of the United States. This manual also contains items of interest to pilots concerning health and medical facts, factors affecting flight safety, a pilot/controller glossary of terms used in the Air Traffic Control System, and information on safety, accident, and hazard reporting. It is offered for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

This manual is complemented by other operational publications which are available upon separate subscription. These publications are:

Graphic Notices and Supplemental Data -- A publication containing aeronautical data, area notices or navigational route information which is supplemental to other operational aeronautical publications and charts. Data contained in this publication is generally not subject to frequent change. This publication is issued quarterly and is available through subscription from the Superintendent of Documents.

Notices to Airmen (Class-II) -- A publication containing current Notices to Airmen (NOTAMs) which are considered essential to the safety of flight as well as supplemental data affecting the other operational publications listed here. It also includes current FDC NOTAMs, which are regulatory in nature, issued to establish restrictions to flight or amend charts or published Instrument Approach Procedures. This publication is issued every 14 days and is available through subscription from the Superintendent of Documents.

Airport/Facility Directory, Alaska Supplement, Pacific Supplement -- These publications contain information on airports, communications, navigational aids, instrument landing systems, VOR receiver check points, preferred routes, FSS/Weather Service telephone numbers, Air Route Traffic Control Center (ARTCC) frequencies, part-time control zones, and various other pertinent, special notices essential to air navigation. These publications are available upon subscription from the National Ocean Survey (NOS), Distribution Division (C44), Riverdale, Maryland 20840.

VFR/IFR PILOT EXAM-O-GRAMS. Provide brief explanations of important aeronautical subjects. These include concepts and procedures critical to aviation safety, common misconceptions among pilot applicants, and areas which cause general difficulty in written tests. Exam-O-Grams are free and may be obtained by contacting U.S. Department of Transportation, Federal Aviation Administration, Flight Standards National Field Office, AFO-590, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

AIRPLANE FLIGHT MANUALS AND PILOT'S OPERATING HANDBOOKS. Aircraft manufacturers issue manuals for each aircraft model. They may be obtained from aircraft companies or possibly from local airplane dealers and distributors.

HOW TO OBTAIN PUBLICATIONS SOLD BY SUPERINTENDENT OF DOCUMENTS.

1. Use an order form (not a letter unless absolutely necessary) when ordering Government publications. Order forms may be duplicated or obtained free upon request from:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

2. Send separate orders for subscription and nonsubscription items.

3. Give the exact name, Advisory Circular identification number, and stock number when ordering publications.

4. Send a check or money order for the exact amount made out to the Superintendent of Documents; DO NOT SEND CURRENCY. (Include an additional 25% to cover postage for foreign mailing.)

5. If a letter is used to request publications, enclose a self-addressed mailing label.

6. All prices are subject to change. The latest Advisory Circular Checklist, AC 00-2, should be consulted for current pricing of publications. It is important that the correct amount be enclosed with the order.

CHARTS

The National Ocean Survey publishes and distributes Aeronautical Charts of the United States.

A "Catalog of Aeronautical Charts and Related Publications" which lists prices and information regarding distribution service may be obtained free, upon request, from:

Distribution Division (C44)
National Ocean Survey
Riverdale, Maryland 20840

Orders for specific charts or publications are made to the address given above and should be accompanied by a check or money order made payable to, "NOS, U.S. Department of Commerce, C44."

STUDY OUTLINE
FLIGHT INSTRUCTOR - AIRPLANE KNOWLEDGE AREAS

This study outline is the framework of the basic aeronautical knowledge that the prospective flight instructor is required to know; questions in the FAA written test can be related to one or more of the topics in the outline. This subject matter is predicated on operationally realistic airman activity and meets the requirements specified in Federal Aviation Regulations.

I. FEDERAL AVIATION REGULATIONS

A. Parts 1 and 71: Definitions and Abbreviations; Controlled Airspace.

1. Air commerce
2. Airport traffic area
3. Ceiling
4. Commercial operator
5. Flight level
6. Flight visibility
7. Interstate air commerce
8. Large aircraft
9. Major alteration
10. Major repair
11. Pilot in command
12. Second in command
13. Federal airway
14. Control area
15. Continental control area
16. Control zone
17. Route segment
18. Terminal control area
19. Positive control area

B. Part 23: Airworthiness Standards: Normal, Utility, and Acrobatic Category Airplanes.

1. Applicability
2. Airplane categories
3. Empty weight
4. Stalling speed
5. Takeoff
6. Landing
7. Spinning
8. Ground and water handling characteristics
9. Flight envelope
10. Design airspeeds
11. Cockpit control knob shape
12. Flight and navigation instruments
13. Powerplant instruments
14. Miscellaneous equipment
15. Airspeed indicating system
16. Magnetic direction indicator
17. Markings and placards
18. Airplane flight manual
19. Approved manual material
20. Operating limitations

C. Part 61: Certification: Pilots and Flight Instructors.

1. Required certificates/ratings
2. Certificates and ratings issued
3. Expired pilot certificates/reissuance
4. Carriage of narcotic drugs/marihuana
5. Duration of pilot certificates
6. Duration of medical certificates
7. General limitations
8. Pilot logbooks
9. Operations during medical deficiency
10. Second in command qualifications
11. Recent experience: Pilot in command
12. Pilot-in-command proficiency check
13. Falsification, reproduction, alteration
14. Glider towing: experience and instruction
15. Change of address
16. Student pilot limitations
17. Private pilot privileges/limitations
18. Commercial pilot privileges/limitations
19. Flight instructor records
20. Flight instructor authorizations and limitations
21. Renewal of flight instructor certificate

D. Part 91: General Operating and Flight Rules--General (Subpart A).

1. Responsibility of pilot in command
2. Pilot in command/more than one pilot
3. Preflight action
4. Flight crewmembers at stations
5. Interference with crewmembers
6. Careless or reckless operation
7. Liquor and drugs
8. Carriage of narcotic drugs
9. Dropping objects
10. Fastening of safety belts
11. Parachutes and parachuting
12. Towing gliders and other objects
13. Portable electronic devices
14. Flight instruction: certificates required
15. ATC transponder equipment requirements
16. Civil aircraft: certificates required
17. Aircraft airworthiness
18. Aircraft operating limitations/markings
19. Supplemental oxygen
20. Instrument and equipment requirements
21. Limited/restricted aircraft limitations
22. Ferry flight with one engine inoperative

23. Emergency exits for airplanes
24. Aural speed warning device
25. Altitude alerting system or device
26. Emergency locator transmitters
27. Report: aircraft identification/activity

E. Part 91: General Operating and Flight Rules (Subpart B).

1. Waivers
2. Operating near other aircraft
3. Right-of-way rules
4. Aircraft speed
5. Acrobatic flight
6. Aircraft lights
7. Complying -- ATC clearances/instructions
8. ATC light signals
9. Minimum safe altitudes; general
10. Altimeter settings
11. Flight plan; information required
12. Flights between Mexico/Canada/U.S.A.
13. Operation--in vicinity of airport
14. Operation--airport with control tower
15. Operation--airport without control tower
16. Flight in terminal control areas
17. Temporary flight restriction
18. Flight test areas
19. Restricted and prohibited areas
20. Positive control areas; route segments
21. Operations to/over Cuba
22. Basic VFR weather minimums
23. Special VFR weather minimums
24. VFR cruising altitude or flight level
25. ATC transponder test/inspection

F. Part 91: General Operating and Flight Rules--Maintenance, Preventative Maintenance, and Alterations (Subpart C).

1. General maintenance and alterations
2. Maintenance required
3. Carrying persons after repair/alteration
4. Inspections/progressive inspections
5. Altimeter system tests/inspections
6. Maintenance records/transfer of records
7. Rebuilt engine maintenance records
8. ATC transponder test/inspection

G. Part 135: Air Taxi Operators and Commercial Operators of Small Aircraft.

1. General
2. Rules--ATCO certificate holder
3. Operating rules
4. Crewmember qualifications
5. Aircraft and equipment

II. NATIONAL TRANSPORTATION SAFETY BOARD--Part 830

A. General.
1. Applicability
2. Definitions

B. Initial Notification of Aircraft Accidents, Incidents, and Overdue Aircraft.

1. Immediate notification
2. Information to be given in notification

C. Preservation of Aircraft Wreckage, Mail, Cargo, and Records.

D. Reporting of Aircraft Accidents, Incidents, and Overdue Aircraft.

III. FAA ADVISORY CIRCULARS

A. Series 00--General.
B. Series 20--Aircraft.
C. Series 60--Airmen.
D. Series 70--Airspace.
E. Series 90--Air Traffic Control and General Operations.
F. Series 120--Air Carrier and Commercial Operators and Helicopters.
G. Series 140--Schools.
H. Series 150--Airports.
I. Series 170--Air Navigation Facilities.

IV. FLIGHT INFORMATION/OPERATIONAL PUBLICATIONS.

A. AIM--Basic Flight Information and ATC Procedures.

1. Glossary of aeronautical terms
2. Airport lighting/marking/aids
3. Air navigation radio aids
4. VOR (VHF omnidirectional range)
5. VOR receiver check
6. Distance measuring equipment
7. VHF direction finder
8. Radar
9. Visual approach slope indicator (VASI)
10. Rotating beacons
11. In-runway lightings
12. Runway markings
13. Controlled/uncontrolled airspace
14. Operating at tower and nontower airports
15. Special use airspace--prohibited, restricted, alert areas, military operations areas
16. Services available to pilots
17. Automatic terminal information service (ATIS)

18. ATC departure/en route/arrival procedures
19. Radar traffic information service
20. Transponder operation
21. Terminal control area
22. Terminal radar program for VFR aircraft
23. Aeronautical advisory stations (UNICOM)
24. Radiotelephone phraseology/technique
25. Traffic/wind direction indicators
26. Weather information/briefing
27. En route flight advisory service
28. Transcribed weather broadcasts
29. Scheduled weather broadcasts
30. In-flight weather advisories
31. Clear air turbulence
32. Thunderstorms
33. Flight plans
34. ADIZ and designated mountainous area
35. Pilot/controller roles/responsibilities
36. Medical facts for pilots
37. Fatigue
38. Hypoxia
39. Hyperventilation
40. Alcohol
41. Carbon monoxide
42. Good operating practices
43. Emergency procedures

B. Airport/Facility Directory.

1. Abbreviations
2. Legend
3. Special notices
4. VOR receiver checkpoints
5. Aeronautical chart bulletin
6. En route flight advisory service

C. Notices to Airmen (NOTAMS).

1. Extended NOTAMS
2. FDC NOTAMS
3. Special NOTAMS

D. Graphic Notices and Supplemental Data.

1. Parachute jumping areas
2. Special operation military training routes
3. Terminal area graphic notices
4. Terminal radar service areas (TRSAs)

V. PHYSIOLOGICAL FACTORS RELATED TO FLIGHT

A. Adjustment to the Flight Environment.

1. Ground habits vs. flight habits
2. Individual differences in pilots
3. Physiological factors important to the pilot

B. Reaction of the Body to Changes in Atmosphere.

1. Changes in altitude
2. Aerotitis
3. Aerosinusitis

C. Reaction of the Body to Changes in Oxygen Partial Pressure.

1. Hypoxia
2. Causes of carbon monoxide poisoning
3. Time of useful consciousness
4. Cabin pressurization and decompression

D. Self Imposed Stress.

1. Fatigue and its effect on the body
2. Alcohol and its effects on the body
3. Drugs and their effects on the body
4. Scuba diving and its effect on the body
5. Panic causes and prevention--hyperventilation

E. Sensations in Flight.

1. Body sensory systems involved in equilibrium

a. Eyes
b. Inner ear
c. Skeletal muscles

2. Sensory illusions in flight--vertigo spatial disorientation

a. Flight factors contributing to sensory illusions
b. Flight factors contributing to visual illusions
c. Combating sensory illusions

F. Principles and Problems of Vision.

1. Reactions to illumination levels and techniques of seeing
2. Instrument lighting
3. Night vision

G. Noise, Vibration, and Temperature.

H. Oxygen Equipment.

1. Requirements
2. Types of oxygen

1. Storage of oxygen
2. Regulators and masks

VI. AVIATION WEATHER

A. The Earth's Atmosphere.

1. Composition
2. Vertical structure
3. The standard atmosphere
4. Density and hypoxia

B. Temperature.

1. Temperature measurement
2. Heat and temperature
3. Temperature aloft and lapse rates
4. Temperature variation

C. Atmospheric Pressure and Altimetry.

1. Atmospheric pressure measurements
2. Sea level pressure
3. Station pressure
4. Pressure variations
5. Pressure systems
6. Altimeters and altimeter setting
7. Effect of temperature

D. Wind.

1. Basic theory of general circulation
2. Convection
3. Pressure gradient force
4. Coriolis force
5. Friction and mountain effects
6. The jet stream
7. Local and small scale winds
8. Large wind system
9. Wind, pressure systems, and weather
10. Wind shear

E. Moisture.

1. Measurements
   a. Relative humidity
   b. Dewpoint
2. Change of state
3. Cloud formation precipitation
4. Condensation and sublimation products

F. Stability and Instability.

1. Adiabatic process
2. Lapse rates
3. Stability determinations
4. Effects of stability or instability

G. Clouds.

1. Composition
2. Formation and structure
3. Types
4. Recognition/signposts

H. Air Masses.

1. Source regions
2. Classification of air masses
3. Air mass modification
4. Summer and winter air mass weather

I. Fronts.

1. Structures
2. Types
3. Frontal waves and occlusions
4. Frontolysis and frontogenesis
5. Associated weather

J. Turbulence.

1. Convective currents
2. Obstructions to wind flow
3. Wind shear
4. Clear air turbulence
5. Categories of turbulence intensities
6. Wake turbulence

K. Icing.

1. Ice-producing cloud types
2. Structural ice formation
3. Frost and ground icing
4. Types and intensities of in-flight structural icing
5. Accretion rate of in-flight structural icing
6. Effects of in-flight structural icing
7. Structural aircraft icing and frost on the ground
8. Structural anti-icing and deicing
9. Instrument and powerplant icing
10. Fuel and oil anti-icing

L. Thunderstorms.

1. Conditions necessary for formation
2. Structure
3. Classification
4. Hazards
5. Information from radar
6. Tornadoes
7. Do's and don'ts of thunderstorm flying

M. Common IFR Producers.

1. Fog
2. Low stratus clouds
3. Haze and smoke
4. Blowing obstructions to vision
5. Precipitation
6. Obscured or partially obscured sky

N. The Nation's Aviation Weather Reporting System.

1. Observations
2. Meteorological centers and forecast offices
3. Service outlets
4. Users

O. Weather Observations.

1. Surface weather observations
2. Pilot reports (PIREPS)
3. Weather radar observations
4. Upper air observations

P. Weather Charts.

1. Weather depiction charts
2. Surface weather charts
3. Constant pressure charts
4. Winds aloft charts
5. Radar summary charts
6. Prognostic surface and prognostic constant pressure charts
7. Prognostic significant weather charts
8. Density altitude chart

Q. Aviation Weather Forecasts.

1. Terminal forecasts (FT)
2. Area forecasts (FA)
3. Winds aloft forecasts (FD)
4. TWEB route forecasts and synopsis
5. In-flight weather advisories (WA)
6. Severe weather outlooks (AC)
7. Severe weather forecasts (WW)
8. Surface analysis and prognoses

R. Services to Pilots.

1. FSS briefing
2. Automatic terminal information service
3. Pilots automatic telephone weather answering service (PATWAS)
4. Transcribed weather broadcasts (TWEB)
5. En route flight advisory service
6. Scheduled weather broadcasts
7. Request/reply service

VII. AIRPLANE OPERATION

A. General.

1. Preflight/postflight safety practices
2. Flight controls
3. Wings and empennage
4. Fuel system principles
5. Fuel contamination--prevention/elimination
6. Airplane hydraulic systems--airplane electrical systems
7. Wake turbulence--causes/precautions
8. Crosswind takeoff/landing practices
9. Proper loading of the aircraft
10. Recovery from critical flight situations
11. Aircraft operating limitations
12. High-altitude operations/pressurization
13. Use of supplemental oxygen and oxygen equipment
14. Midair collision avoidance precautions
15. Normal/crosswind takeoff/landing practices
16. Maximum performance takeoff/landing
17. Emergency landings
18. Design maneuvering speed
19. Taxiing during strong surface winds
20. Flap operation
21. Retractable landing gear operation
22. Nosewheel steering
23. Oxygen and systems

B. Performance.

1. Takeoff charts
2. Rate-of-climb charts
3. Cruise charts
4. Maximum safe crosswind charts
5. Use of Denalt computer
6. Landing charts
7. Stall speed charts
8. Airspeed correction charts
9. Computing density/pressure altitudes
10. Effect of density altitude on performance
11. Critical performance speeds--"V" speeds
12. Effect of wind and shear on aircraft performance
13. Bank/speed versus rate/radius of turns
14. Stall speed versus altitude or attitude
15. Stall speed versus indicated/true airspeed
16. Obstacle clearance takeoff/landing
17. Best angle-/rate-of-climb
18. Computations of gross weight/useful load
19. Computation of center of gravity
20. Vn flight envelope

VIII. ENGINE OPERATION

A. General.

1. Reciprocating engine principles
2. Carburetion principles
3. Fuel injection principles
4. Lubrication systems
5. Ignition systems
6. Fuel systems
7. Electrical systems
8. Supercharger/turbocharger systems
9. Propeller principles
10. Manifold pressure versus RPM
11. Engine instruments
12. Effect of density altitude

B. Operation.

1. Engine starting/shutdown procedures
2. Detonation causes and effects
3. Carburetor icing and effect of heat
4. Engine operating limitations
5. Use of throttle, propeller, mixture controls
6. Interpreting engine instruments
7. Use of proper fuel
8. Multiengine critical engine

IX. NAVIGATION

A. General.

1. Chart projections used for air navigation
2. Direction on a sphere
3. Distance on a sphere
4. Aeronautical charts
   a. Topographic information
   b. Cultural features
   c. Relief
   d. Aeronautical data
   e. Navigation aids
5. Time zones and 24-hour system
6. Metric conversions

B. Pilotage.

1. Plotting course
2. Identifying landmarks

C. Dead Reckoning.

1. Measuring courses
2. Measuring distances
3. Effect of wind on navigation
4. Magnetic variation and deviation
5. True airspeed and groundspeed
6. True course, magnetic course
7. Wind direction

D. Wind Triangles (Vectors).

1. True course and groundspeed
2. True heading and groundspeed
3. Magnetic heading and groundspeed
4. True course and true airspeed
5. Wind direction and speed

E. Navigation Computer.

1. Basic calculations
   a. Time, speed, distance
   b. Fuel consumption
   c. Conversions-temperatures, speeds, distances, altitudes
   d. Off course corrections
   e. Climbs and descents
   f. Density altitude
2. Wind (vector) problems
   a. Courses and headings
   b. Groundspeed and true airspeed
   c. Off course corrections
   d. Wind direction and speed

F. Radio Navigation.

1. Characteristics of VOR facilities
2. Tuning VOR receivers
3. Identifying VOR stations
4. VOR interpretation/orientation
5. Intercepting VOR radials
6. Tracking VOR radials
7. Groundspeed checks using VOR radials
8. VOR frequency interference
9. VOR test signals/VOR receiver checks
10. Characteristics of ADF facilities
11. Tuning ADF receivers
12. Identifying stations used for ADF
13. ADF/RMI interpretation/orientation
14. Intercepting ADF/RMI bearings
15. Tracking ADF/RMI bearings or "homing"
16. Marker beacons/outer compass locators
17. Distance measuring equipment (DME)
18. Transponder use
19. Emergency locator transmitters
20. Direction finding (DF)

X. AERODYNAMICS AND PRINCIPLES OF FLIGHT

A. Laws of motion.
1. Bernoulli
2. Newton

B. Functions of the Flight Controls.

C. Principles of Airfoils.

1. Pressure above and below

2. Relative wind and angle of attack
3. Downwash
4. Wingtip vortices

D. Wing Planform.

1. Area/span/chord
2. Aspect ratio/taper/sweepback
3. Effect of planform on stall patterns

E. Forces Acting on an Airplane.

1. Lift
2. Drag-induced/parasite
3. Thrust
4. Weight
5. Centrifugal/centrepital

F. Flight Controls/Axes of an Airplane.

G. Lift/Drag During Turns.

1. Angle of attack
2. Adverse yaw

H. Lift Versus Angle of Attack.

I. Lift/Thrust Versus Air Density.

J. Types/Effect of Flaps, Spoilers, Divebrakes.

K. Effect of Flaps on Lift/Drag/Trim.

L. Effect of Ice/Snow/Frost on Airfoils.

M. Power Versus Climb/Descent/Level Flight.

N. Gyroscopic Principles.

O. Types and Effects of Drag--Induced/Parasite/Profile.

P. Ground Effect.

Q. Principles of Propellers.

R. Loads/Load Factors.

S. Stability--Static and Dynamic/Longitudinal/Lateral/Directional.

1. Center of gravity
2. Center of pressure
3. Dihedral/sweepback
4. Downwash

T. Airplane Performance Characteristics.

XI. FLIGHT INSTRUMENTS AND SYSTEMS

A. Attitude Indicator Operation/Errors.

B. Heading Indicator Operation/Errors.

C. Turn Indicator/Coordinator.

D. Altimeter Operation/Errors.

E. Vertical Speed Indicator Operation/Errors.

F. Airspeed Indicator Operation/Errors.

G. Vacuum Systems/Instruments.

H. Pitot/static Systems/Instruments.

I. Magnetic Compass Operation/Errors.

J. Altimeter Setting Procedure/Significance.

K. Pressure Altitude Significance/Obtaining.

L. Gyroscopic Principles.

XII. RADIO COMMUNICATIONS

A. VHF Radio Communication/Phraseology.

B. Position Reporting Procedures.

C. Tower/FSS/En Route Advisories/Instructions.

D. FSS Communications Procedures.

E. Obtaining Emergency Assistance.

F. Lost Procedure When Radio is Inoperative.

G. Use of Proper Communications Frequencies.

XIII. BASIC INSTRUMENT FLYING

A. Components of Attitude Instrument Flying.

B. Pitch, Bank, Power Control.

C. Straight-and-Level Flight.

D. Turns/Turns to Predetermined Headings.

E. Constant Rate Climbs/Descents/Leveloffs.

F. Constant Speed Climbs/Descents/Leveloffs

G. Magnetic Compass Turns.

H. Effect of Changes in Airspeed.

I. False Sensations in Flight.

EXCERPTS OF REGULATIONS ON CERTIFICATION OF FLIGHT INSTRUCTORS

Subpart G—Flight Instructors

§ 61.181 Applicability.

This subpart prescribes the requirements for the issuance of flight instructor certificates and ratings, the conditions under which those certificates and ratings are necessary, and the limitations upon these certificates and ratings.

§ 61.183 Eligibility requirements: general.

To be eligible for a flight instructor certificate a person must—

(a) Be at least 18 years of age;

(b) Read, write, and converse fluently in English;

(c) Hold—

(1) A commercial or airline transport pilot certificate with an aircraft rating appropriate to the flight instructor rating sought, and

(2) An instrument rating, if the person is applying for an airplane or an instrument instructor rating;

(d) Pass a written test on the subjects in which ground instruction is required by § 61.185; and

(e) Pass an oral and flight test on those items in which instruction is required by § 61.187.

§ 61.185 Aeronautical knowledge.

(a) Present evidence showing that he has satisfactorily completed a course of instruction in at least the following subjects:

(1) The learning process.

(2) Elements of effective teaching.

(3) Student evaluation, quizzing, and testing.

(4) Course development.

(5) Lesson planning.

(6) Classroom instructing techniques.

(b) Have logged ground instruction from an authorized ground or flight instructor in all of the subjects in which ground instruction is required for a private and commercial pilot certificate, and for an instrument rating, if an airplane or instrument instructor rating is sought.

§ 61.187 Flight proficiency.

(a) An applicant for a flight instructor certificate must have received flight instruction, appropriate to the instructor rating sought in the subjects listed in this paragraph by a person authorized in paragraph (b) of this section. In addition, his logbook must contain an endorsement by the person who has given him the instruction certifying that he has found the applicant competent to pass a practical test on the following subjects:

(1) Preparation and conduct of lesson plans for students with varying backgrounds and levels of experience and ability.

(2) The evaluation of student flight performance.

(3) Effective preflight and postflight instruction.

(4) Flight instructor responsibilities and certifying procedures.

(5) Effective analysis and correction of common student pilot flight errors.

(6) Performance and analysis of standard flight training procedures and maneuvers appropriate to the flight instructor rating sought.

(b) The flight instruction required by paragraph (a) of this section must be given by a person who has held a flight instructor certificate during the 24 months immediately preceding the date the instruction is given, who meets the general requirements for a flight instructor certificate prescribed in § 61.183, and who has given at least 200 hours of flight instruction, or 80 hours in the case of glider instruction, as a certificate flight instructor.

§ 61.191 Additional flight instructor ratings.

The holder of a flight instructor certificate who applies for and additional rating on that certificate must—

(a) Hold an effective pilot certificate with ratings appropriate to the flight instructor rating sought.

(b) Have had at least 15 hours as pilot in command in the category and class of aircraft appropriate to the rating sought: and

(c) Pass the written and practical test prescribed in this subpart for the issuance of a flight instructor certificate with the rating sought.

§ 61.35 Written test: prerequisites and passing grades.

(a) An applicant for a written test must—

(1) Show that he has satisfactorily completed the ground instruction or home study course required by this Part for the certificate or rating sought;

(2) Present as personal identification an airman certificate, driver's license, or other official document; and

(3) Present a birth certificate or other official document showing that he meets the age requirement prescribed in this Part for the certificate sought not later than 2 years from the date of application for the test.

(b) The minimum passing grade is specified by the Administrator on each written test sheet or booklet furnished to the applicant.

§ 61.39 Prerequisites for flight tests.

(a) To be eligible for a flight test for a certificate, or an aircraft or instrument rating issued under this Part, the applicant must—

(1) Have passed any required written test since the beginning of the 24th month before the month in which he takes the flight test;

(2) Have the applicable instruction and aeronautical experience prescribed in this Part;

(3) Hold a current medical certificate appropriate to the certificate he seeks or, in the case of a rating to be added to his pilot certificate, at least a third-class medical certificate issued since the beginning of the 24th month before the month in which he takes the flight test;

Subpart D—Private Pilots

§ 61.105 Aeronautical knowledge.

An applicant for a private pilot certificate must have logged ground instruction from an authorized instructor, or must present evidence showing that he has satisfactorily completed a course of instruction or home study in at least the following areas of aeronautical knowledge appropriate to the category of aircraft for which a rating is sought.

(a) *Airplanes.*

(1) The Federal Aviation Regulations applicable to private pilot privileges, limitations, and flight operations, accident reporting requirements of the National Transportation Safety Board, and the use of the "Airman's Information Manual" and the FAA Advisory Circulars;

(2) VFR navigation, using pilotage, dead reckoning, and radio aids;

(3) The recognition of critical weather situations from the ground and in flight and the procurement and use of aeronautical weather reports and forecasts; and

(4) The safe and efficient operation of airplanes, including high density airport operations, collision avoidance precautions, and radio communication procedures.

Subpart E—Commercial Pilots

§ 61.125 Aeronautical knowledge.

An applicant for a commercial pilot certificate must have logged ground instruction from an authorized instructor, or must present evidence showing that he has satisfactorily completed a course of instruction or home study, in at least the following areas of aeronautical knowledge appropriate to the category of aircraft for which a rating is sought.

(a) *Airplanes.*

(1) The regulations of this chapter governing the operations, privileges, and limitations of a commercial pilot, and the accident reporting requirements of the National Transportation Safety Board.

(2) Basic aerodynamics and the principles of flight which apply to airplanes; and

(3) Airplane operations, including the use of flaps, retractable landing gears, controllable propellers, high altitude operation with and without pressurization, loading and balance computations, and the significance and use of airplane performance speeds.

MAXIMUM TIME ALLOWED FOR TEST: FIVE HOURS

GENERAL INSTRUCTIONS

READ CAREFULLY

1. This book contains 846 questions beginning with number 201. You are required to answer 100 QUESTIONS ONLY.
2. Refer to the QUESTION SELECTION SHEET to determine which 100 questions you are to answer.
3. Mark your answers in the appropriate places on the ANSWER SHEET.
4. All supplementary information required to answer certain questions can be found on the page opposite the question or above the question.
5. DO NOT MARK ON THIS QUESTION BOOK. A plastic overlay sheet is provided to place over performance charts and illustrations. This permits marking on the plastic sheet without defacing the question book.
6. Read each question carefully and select the best answer. Always answer questions in terms of current regulations, procedures, or techniques.
7. The MINIMUM passing grade is 70 percent.

WARNING

§ WRITTEN TESTS CHEATING OR OTHER UNAUTHORIZED CONDUCT

(a) EXCEPT, AS AUTHORIZED BY THE ADMINISTRATOR, NO PERSON MAY --

(1) COPY OR INTENTIONALLY REMOVE A WRITTEN TEST UNDER THIS PART.

(2) GIVE TO ANOTHER OR RECEIVE FROM ANOTHER ANY PART OR COPY OF THAT TEST.

(3) GIVE HELP ON THAT TEST TO OR RECEIVE HELP ON THAT TEST FROM, ANY PERSON DURING THE PERIOD THAT TEST IS BEING GIVEN

(4) TAKE ANY PART OF THAT TEST IN BEHALF OF ANOTHER PERSON.

(5) USE ANY MATERIAL OR AID DURING THE PERIOD THAT TEST IS BEING GIVEN; OR

(6) INTENTIONALLY CAUSE, ASSIST OR PARTICIPATE IN ANY ACT PROHIBITED BY THIS PARAGRAPH.

(b) NO PERSON WHO COMMITS AN ACT PROHIBITED BY PARAGRAPH (a) OF THESE SECTIONS IS ELIGIBLE FOR ANY AIRMAN OR GROUND INSTRUCTOR CERTIFICATE OR RATING UNDER THIS CHAPTER FOR A PERIOD OF ONE YEAR AFTER THE DATE OF THAT ACT. IN ADDITION, THE COMMISSION OF THAT ACT IS THE BASIS FOR SUSPENDING OR REVOKING ANY AIRMAN OR GROUND INSTRUCTOR CERTIFICATE OR RATING HELD BY THAT PERSON.

AIRMAN WRITTEN TEST APPLICATION

PRIVACY ACT STATEMENT

The information on this form is required under the authority of the Federal Aviation Act (Section 602). Certification cannot be completed unless the data is complete.

Disclosure of your Social Security Account Number (SSAN) is optional. If you do not supply your SSAN, a substitute number or identifier will be assigned to give your record a unique 9-digit number for internal control of airman records.

If your SSAN has been previously given, it is already in the system. Requests for removal must be in writing. If you do not wish your SSAN on future records, please do not disclose SSAN on airman written test, airman certification, and/or medical certification applications.

Routine uses of records maintained in the system, including categories of users and the purposes of such uses: To determine that airmen are certified in accordance with the provision of the Federal Aviation Act of 1958. Repository of documents used by individual and potential employers to determine validity of airmen qualifications. To support investigative efforts of investigation and law enforcement agencies of Federal, State, and local Governments. Supportative information in court case concerning individual status and/or qualifications in law suits. To provide data for the Comprehensive Airman Information System (CAIS). To provide documents for microfilm and microfiche backup records.

INSTRUCTIONS TO APPLICANT:

* ATTENTION: READ THE FOL[illegible]AGRAPH CAREFULLY BEFORE COMPLETING THIS APPLIC[illegible]

  WHOEVER, IN ANY M[illegible]N THE JURISDICTION OF ANY DEPARTMENT OR AGENC[illegible]ED STATES KNOWINGLY AND WILLFULLY FALSIFIES, CO[illegible] COVERS UP BY ANY TRICK, SCHEME, OR DEVICE A MAT[illegible]ACT, OR MAKES ANY FALSE, FICTITIOUS OR FRAUDULENT ST[illegible]MENTS OR REPRESENTATIONS, OR MAKES OR USES ANY FALSE WRITING OR DOCUMENT KNOWING THE SAME TO CONTAIN ANY FALSE, FICTITIOUS OR FRAUDULENT STATEMENT OR ENTRY, SHALL BE FINED NOT MORE THAN $10,000 OR IMPRISONED NOT MORE THAN 5 YEARS, OR BOTH (U.S. CODE, TITLE 18, SEC. 1001.)

* CERTAIN TEST QUESTIONS INVOLVING REGULATIONS, ATC PROCEDURES, ETC., ARE FREQUENTLY OUTDATED BY VERY RECENT CHANGES. IN THESE INSTANCES, APPLICANTS ARE GIVEN CREDIT FOR THE QUESTION DURING THE PERIOD THAT IT TAKES TO DISTRIBUTE A REVISED QUESTION.

* DO NOT TEAR SHEETS APART.

* TURN TO PAGE 4 AND COMPLETE THE PERSONAL DATA SECTION. BE SURE THAT YOUR SIGNATURE IS ON THE PROPER LINE. BEFORE COMMENCING TEST, READ INSTRUCTIONS FOR MARKING THE ANSWER SHEET.

INSTRUCTIONS TO FAA PERSONNEL:

* REFER TO PAGE 3 OF THE APPLICATION FOR COMPLETION OF THE TIME WAIVER AND SECTION WAIVER BLOCK WHEN REQUIRED.

AC FORM 8080 3(12 78)0052 00 37-2006) Supercedes previous edition

NCS Trans Optic F4041-54321

DEPARTMENT OF TRANSPORTATION — FEDERAL AVIATION ADMINISTRATION

AIRMAN WRITTEN TEST APPLICATION

DATE OF TEST (MONTH, DAY, YEAR) | TITLE OF TEST | TEST NO.

PLEASE PRINT ONE LETTER IN EACH SPACE—LEAVE A BLANK SPACE AFTER EACH NAME

NAME (LAST, FIRST, MIDDLE) | DATE OF BIRTH (MONTH, DAY, YEAR)

MAILING ADDRESS NO. AND STREET, APT. #, P.O. BOX, OR RURAL ROUTE | DESCRIPTION (HEIGHT, WEIGHT, HAIR, EYES)

CITY, TOWN OR POST OFFICE AND STATE | ZIP CODE

BIRTHPLACE (City and State, or foreign country) | CITIZENSHIP | SOCIAL SECURITY NO. | IF A SOCIAL SECURITY NUMBER HAS NEVER BEEN ISSUED CHECK THIS BLOCK ⟶ ☐

Is this a retest? ☐ No ☐ Yes, date of last test | Have you taken or are you taking an FAA approved course for this test? ☐ No ☐ Yes (If "yes" give details below)

Graduation date | NAME OF SCHOOL | CITY AND STATE

CERTIFICATION: I CERTIFY that all of the statements made in this application are true, complete, and correct to the best of my knowledge and belief and are made in good faith. Signature _____

— — DO NOT WRITE IN THIS BLOCK — — FOR USE OF FAA OFFICE ONLY — —

Applicant's identity established by:

CARD A					CARD B				
CATEGORY	TEST NUMBER	TAKE NO.	SECTIONS 1 2 3 4 5 6 7	EXPIRATION MONTH DAY YEAR	CERTIFICATED SCHOOL NUMBER	MECH RP BY SECTION 1 2 3	DATE	ID	FIELD OFFICE DESIGNATION

SIGNATURE of FAA Representative

INSTRUCTIONS FOR MARKING THE ANSWER SHEET. Completely darken only one circle for each question. DO NOT USE (X) OR (✓). Use black lead pencil furnished by examiner. To make corrections, open answer sheet so erasure marks will not show on page 2. Then erase incorrect response on page 4. On page 2 (copy) mark the incorrect response with a slash (/). Questions are arranged in VERTICAL sequence as indicated by the arrows.

1 ①②③④	23 ①②③④	45 ①②③④	67 ①②③④	89 ①②③④	111 ①②③④	133 ①②③④
2 ①②③④	24 ①②③④	46 ①②③④	68 ①②③④	90 ①②③④	112 ①②③④	134 ①②③④
3 ①②③④	25 ①②③④	47 ①②③④	69 ①②③④	91 ①②③④	113 ①②③④	135 ①②③④
4 ①②③④	26 ①②③④	48 ①②③④	70 ①②③④	92 ①②③④	114 ①②③④	136 ①②③④
5 ①②③④	27 ①②③④	49 ①②③④	71 ①②③④	93 ①②③④	115 ①②③④	137 ①②③④
6 ①②③④	28 ①②③④	50 ①②③④	72 ①②③④	94 ①②③④	116 ①②③④	138 ①②③④
7 ①②③④	29 ①②③④	51 ①②③④	73 ①②③④	95 ①②③④	117 ①②③④	139 ①②③④
8 ①②③④	30 ①②③④	52 ①②③④	74 ①②③④	96 ①②③④	118 ①②③④	140 ①②③④
9 ①②③④	31 ①②③④	53 ①②③④	75 ①②③④	97 ①②③④	119 ①②③④	141 ①②③④
10 ①②③④	32 ①②③④	54 ①②③④	76 ①②③④	98 ①②③④	120 ①②③④	142 ①②③④
11 ①②③④	33 ①②③④	55 ①②③④	77 ①②③④	99 ①②③④	121 ①②③④	143 ①②③④
12 ①②③④	34 ①②③④	56 ①②③④	78 ①②③④	100 ①②③④	122 ①②③④	144 ①②③④
13 ①②③④	35 ①②③④	57 ①②③④	79 ①②③④	101 ①②③④	123 ①②③④	145 ①②③④
14 ①②③④	36 ①②③④	58 ①②③④	80 ①②③④	102 ①②③④	124 ①②③④	146 ①②③④
15 ①②③④	37 ①②③④	59 ①②③④	81 ①②③④	103 ①②③④	125 ①②③④	147 ①②③④
16 ①②③④	38 ①②③④	60 ①②③④	82 ①②③④	104 ①②③④	126 ①②③④	148 ①②③④
17 ①②③④	39 ①②③④	61 ①②③④	83 ①②③④	105 ①②③④	127 ①②③④	149 ①②③④
18 ①②③④	40 ①②③④	62 ①②③④	84 ①②③④	106 ①②③④	128 ①②③④	150 ①②③④
19 ①②③④	41 ①②③④	63 ①②③④	85 ①②③④	107 ①②③④	129 ①②③④	
20 ①②③④	42 ①②③④	64 ①②③④	86 ①②③④	108 ①②③④	130 ①②③④	
21 ①②③④	43 ①②③④	65 ①②③④	87 ①②③④	109 ①②③④	131 ①②③④	
22 ①②③④	44 ①②③④	66 ①②③④	88 ①②③④	110 ①②③④	132 ①②③④	

AC FORM 8080 3(12 76)(U057 00 37 2006) Supersedes previous edition

DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

QUESTION SELECTION SHEET

FIA-3A

USE ONLY WITH FIA QUESTION BOOK NO. 3 *

TITLE	TEST NO.
FLIGHT INSTRUCTOR — AIRPLANE	646241

NAME _____

NOTE: IT IS PERMISSIBLE TO MARK ON THIS SHEET

On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number
1	202	26	391	51	602	76	754
2	207	27	395	52	611	77	764
3	212	28	404	53	615	78	768
4	217	29	409	54	622	79	772
5	224	30	416	55	626	80	783
6	229	31	426	56	639	81	790
7	245	32	428	57	646	82	794
8	251	33	432	58	652	83	807
9	259	34	438	59	656	84	814
10	263	35	447	60	658	85	818
11	275	36	451	61	664	86	829
12	280	37	455	62	669	87	839
13	292	38	463	63	671	88	846
14	300	39	468	64	674	89	852
15	314	40	490	65	680	90	861
16	324	41	496	66	685	91	868
17	330	42	507	67	688	92	873
18	335	43	516	68	693	93	877
19	344	44	519	69	697	94	884
20	350	45	527	70	702	95	891
21	354	46	535	71	706	96	900
22	356	47	553	72	715	97	905
23	365	48	569	73	725	98	909
24	374	49	580	74	737	99	915
25	384	50	588	75	742	100	920

FOR OFFICIAL USE ONLY

FLIGHT INSTRUCTOR
— AIRPLANE —

SAMPLE QUESTIONS

001. When the control tower at an airport is in operation, what designated airspace associated with that airport becomes activated?

A02
1- Airport Advisory Area.
2- Control Zone.
3- Airport Traffic Area.
4- Terminal Control Area.

002. Airport Traffic Areas normally extend from the surface up to but not including

A02
1- 3,000 feet above the surface surrounding the airport and have the same horizontal limits of the associated control zone.
2- 3,000 feet above the airport and have a radius of 5 statute miles.
3- the base of the Continental Control Area and have a radius of 10 statute miles.
4- the upper limit of the associated control zones and have a radius of 5 miles with extensions as necessary for instrument approaches.

003. All airports which have air traffic control towers in operation are located in

A02
1- Control Zones.
2- Control Areas.
3- Airport Traffic Areas.
4- Airport Advisory Areas.

004. Airport Traffic Areas exist only at airports that have

A02
1- an FSS located on the airport.
2- radar approach and departure service.
3- Direction Finder (DF) service.
4- operating control towers.

005. When the control tower at an airport is not in operation, what designated airspace associated with that airport becomes inactive?

A02
1- Control Zone.
2- Terminal Radar Service Area.
3- Airport Traffic Area.
4- Airport Advisory Area.

006. Specific requirements pertinent to operating in an Airport Traffic Area apply only at an airport where

A02
1- a Terminal Control Area is established.
2- a Control Zone is in effect.
3- an approach control facility is available.
4- a control tower is in operation.

007. Unless otherwise specified, federal airways extend from

A14
1- 1,200 feet above the surface upward to 14,500 feet and are 15 miles wide.
2- 700 feet above the surface upward to the Continental Control Area and are 10 nautical miles wide.
3- 1,200 feet above the surface upward to 18,000 feet MSL and are 8 nautical miles wide.
4- the surface upward to 18,000 feet MSL and are 4 nautical miles wide.

008. Before acting as pilot in command of high performance airplanes, a private or commercial pilot must have logged pilot in command time in such airplanes before November 1, 1973, or have received flight instruction in airplanes with

B07
1- a minimum of 185 HP.
2- a certificated maximum gross weight of more than 6,000 pounds.
3- a cruising speed of more than 200 knots.
4- more than 200 HP, or retractable landing gear, flaps, and controllable propeller, as the case may be.

009. Unless special authorization is obtained from the Administrator, to act as pilot in command of a transport type airplane that has a certificated takeoff weight of more than 12,500 lbs., a certificated pilot flying VFR is required to hold

B07
1- an Airline Transport Pilot Certificate.
2- only a multiengine class rating.
3- a type rating for that airplane.
4- an instrument pilot rating.

010. To act as pilot in command of an airplane equipped with a retractable landing gear, a person is required to do which of the following if no pilot in command time in such an airplane was logged prior to November 1, 1973?

1- Receive flight instruction in such an airplane.
2- Hold a retractable gear airplane class rating.
3- Make three solo takeoffs and landings in such an airplane
4- Pass an FAA flight test in such an airplane.

011. A pilot is permitted to log flight time as second in command during what portion of a flight?

B08
1- All flight time when performing co-pilot duties in any airplane.
2- All flight time while acting as second in command in an airplane requiring more than one pilot.
3- A maximum of one-half the flight time while acting as second in command of an airplane requiring two pilots.
4- No more than the flight time during which that pilot was the sole manipulator of the controls.

012. Which of the following types of landings are required to meet the recency of experience requirements for a VFR night flight carrying passengers in a multiengine nosewheel-type airplane?

B11
1- Three full stops during daytime in any nosewheel-type airplane and three full stops at night in any single- or multiengine airplane.
2- Three touch-and-go's during daytime in single- or multiengine airplanes and three full stops in any nosewheel-type airplane.
3- Three full stops during daytime and three full stops at night, in any multiengine nosewheel-type airplane.
4- Three full stops at night in any multiengine airplane.

013. Which of the following types of landings are required to meet the recency of experience requirements for a VFR night flight carrying passengers in a single-engine nosewheel-type airplane?

B11
1- Three full stops during daytime and three full stops at night in any single-engine nosewheel-type airplane.
2- Three full stops at night in any single-engine airplane.
3- Three touch-and-go's during daytime in single- or multiengine airplanes and three full stops in any nosewheel-type airplane.
4- Three full stops during daytime in any nosewheel-type airplane and three full stops at night in any single- or multiengine airplane.

014. Which statement is true regarding Control Areas?

A15
1- They have higher basic VFR minimums than Control Zones.
2- They are located at tower-controlled airports only.
3- They start at the surface and extend upward to the base of the Continental Control Area.
4- They start at an altitude of 700 feet or higher above the surface.

015. With certain exceptions, the Continental Control Area extends upward from

A16
1- 10,000 feet MSL.
2- 14,500 feet MSL.
3- 18,000 feet MSL.
4- the surface.

016. Within the contiguous U.S., Control Areas extend upward from either 700 feet or 1,200 feet above the surface to but not including

A17
1- 3,000 feet AGL.
2- 18,000 feet MSL.
3- 24,000 feet MSL.
4- the base of the Continental Control Area.

017. One of the major differences between Control Zones and Control Areas is that all Control Zones

A17
1- have higher basic VFR weather minimums than Control Areas.
2- always begin at the surface, while Control Areas always begin at 1,200 feet above the surface.
3- begin at the surface, while all Control Areas begin at an altitude of 700 feet or higher above the surface.
4- are located around tower-controlled airports only.

018. Within the contiguous U.S., the vertical limit of Control Zones extends from the surface upward to

A17
1- infinity.
2- the base of the Continental Control Area.
3- but not including 3,000 feet AGL.
4- but not including 10,000 feet MSL.

019. Commercial pilots are required to have a current and appropriate pilot and medical certificate in their personal possession only when acting as

B01
1- pilot in command while carrying passengers.
2- pilot in command during operations in interstate commerce.
3- a flight crewmember for compensation or hire.
4- a required pilot flight crewmember.

020. For recently certificated commercial pilots to carry passengers for compensation beyond a 50-mile radius during daylight hours, the pilot in command is required to possess only a Commercial Pilot Certificate and a current

B01
1- Class II Medical Certificate, as well as have required recent instrument experience.
2- Class II Medical Certificate.
3- Class II Medical Certificate, as well as an instrument pilot rating.
4- Class III Medical Certificate.

021. Which of the following is considered "class ratings?"

B02
1- Single-engine; multiengine; rotorcraft; lighter-than-air.
2- Single-engine land; multiengine land; single-engine sea; multiengine sea.
3- Single and multiengine land; single and multiengine sea; airplane instrument; airplane "type" ratings.
4- Airplane; rotorcraft; glider; lighter-than-air.

022. A Second-Class Medical Certificate which was issued on April 10, 1978, permits a commercial pilot to exercise which of the following privileges?

B06
1- Commercial pilot privileges until, but not after April 30, 1979.
2- Commercial pilot privileges until, but not after April 10, 1980.
3- Private pilot privileges until, but not after March 31, 1979.
4- Private pilot privileges until, but not after April 10, 1979.

023. What is the earliest date a commercial pilot's Second-Class Medical Certificate could have been issued during the preceding calendar year in order to exercise commercial pilot privileges on November 10 of this year?

B06
1- October 31.
2- November 1.
3- November 10.
4- November 30.

024. Suppose a First-Class Medical Certificate was issued to the pilot on Dec. 17, 1978. Select the last date on which this medical certificate is valid for these operations.

(A) Private pilot operations.
(B) Commercial pilot operations.
(C) Airline Transport pilot operations.

a. June 17, 1979
b. June 30, 1979
c. Dec. 17, 1979
d. Dec. 31, 1979
e. Jan. 31, 1979
f. Dec. 31, 1980
g. Jan. 31, 1980

The correct matchings are

B06
1- A-f; B-c; C-a.
2- A-g; B-e; C-b.
3- A-g; B-d; C-a.
4- A-f; B-d; C-b.

025. Unless otherwise authorized, the pilot in command is required to have a type rating when operating which of the following?

B07
1- Any multiengine airplane that is operated in interstate commerce.
2- Any airplane which has a certificated gross weight of 6,000 lbs. or more.
3- Any helicopter which is used for any commercial purposes.
4- Any turbojet-powered airplane.

026. Which of the following would be authorized by regulations if a pilot's commercial certificate lists only an airplane, multiengine land class, and DC-3 type rating?

B07
1- Operating any large airplane for hire.
2- Operating any multiengine airplane regardless of its gross weight.
3- Carrying passengers for hire in a multiengine airplane.
4- Carrying passengers not for hire in a single-engine airplane.

027. Without special authorization from the Administrator, to act as pilot in command of a multiengine turbojet powered airplane under VFR, a certificated pilot is required to hold

B07
1- an instrument pilot rating.
2- an Airline Transport Pilot Certificate.
3- only a multiengine class rating.
4- a type rating for that airplane.

028. A pilot is required to hold a category and class rating appropriate to the aircraft being flown, in which of the following operations?

B07
1- All flights while acting as pilot in command.
2- Flights for compensation or hire while acting as pilot in command.
3- Flight tests given by the Administrator (FAA).
4- All solo flights.

029. To act as pilot in command of an airplane that has more than 200 horsepower, a person is required to do which of the following if no pilot in command time in such an airplane was logged prior to November 1, 1973?

B07
1- Hold a 200-horsepower class rating.
2- Receive flight instruction in such an airplane.
3- Pass an FAA flight test in such an airplane.
4- Make three solo takeoffs and landings in such an airplane.

030. Unless otherwise authorized, the pilot in command is required to have a type rating when operating which of the following?

B07
1- Any aircraft that is certificated for more than one pilot.
2- Any multiengine airplane having a gross weight of more than 6,000 lbs.
3- Any airplane operated in interstate commerce.
4- Any airplane having a gross weight of more than 12,500 lbs.

031. A certificated flight instructor who has not satisfactorily accomplished a biennial flight review or satisfactorily completed a required pilot proficiency check within the required period, is

B11
1- authorized to fly solo only.
2- authorized to act as pilot in command, but not for compensation.
3- not authorized to give instruction except to holders of Private Pilot Certificates.
4- not authorized to fly solo.

032. Prior to acting as pilot in command of an aircraft, a pilot must have satisfactorily accomplished a flight review or satisfactorily completed a pilot proficiency check within the preceding

B11
1- 36 months.
2- 24 months.
3- 12 months.
4- 6 months.

033. Unless a pilot has satisfactorily accomplished a biennial flight review or satisfactorily completed a pilot proficiency check within the required period, a private pilot is not authorized to

B11
1- act as pilot in command of any aircraft.
2- act in any capacity as a crewmember of an aircraft.
3- act as pilot in command of an aircraft unless a certificated flight instructor is aboard.
4- act as pilot in command of an aircraft unless another pilot is aboard.

034. If the pilot in command does not meet the night recency of experience requirement, and official sunrise is 0700 CDT, the earliest time of takeoff with passengers aboard should be

B11
1- 0730 CDT.
2- 0700 CDT.
3- 0630 CDT.
4- 0600 CDT.

035. What night flight instruction is required for a private pilot to be certificated with an airplane rating without the limitation "night flying prohibited?"

B16
1- 5 hours at night including five takeoffs and landings.
2- 3 hours at night including ten takeoffs and landings.
3- 1 hour at night including five takeoffs and landings.
4- 1 hour at night including three takeoffs and landings.

036. Which statement is true concerning a commercial or private pilot who holds a Second-Class Medical Certificate which was issued on May 16, 1977?

B16
1- A certificated commercial pilot may exercise commercial pilot privileges until June 1, 1978, and private pilot privileges until June 1, 1979.
2- A certificated private pilot is permitted to exercise private pilot privileges until May 1, 1978, and student pilot privileges until May 1, 1979.
3- A certificated commercial pilot is permitted to exercise commercial pilot privileges until April 30, 1979.
4- A certificated private pilot is permitted to exercise private pilot privileges only until the end of April 30, 1978.

037. Which statement is true regarding private pilot privileges?

B16
1- Under no circumstances is a private pilot authorized to receive compensation for acting as pilot in command of an airplane.
2- A private pilot is authorized to receive compensation for acting as pilot in command of an airplane with passengers aboard if the flight is not in connection with a business venture.
3- A private pilot is permitted to personally accept a donation for acting as pilot in command of an airplane used in a passenger carrying airlift that is sponsored by a charitable organization.
4- A private pilot is permitted to share the operating expenses of a flight with the passengers.

038. Suppose your student had a flight review on June 6, 1977, and received a Commercial Pilot Certificate on March 28, 1978. When is the next flight review normally due?

B11
1- March 28, 1980.
2- June 6, 1980.
3- March 28, 1979.
4- June 6, 1979.

039. Suppose you received a Commercial Pilot Certificate on June 15, 1977, and a Flight Instructor Certificate on April 21, 1978. Unless a subsequent proficiency check is accomplished, when is the next flight review due?

B11
1- April 21, 1980.
2- April 21, 1979.
3- June 15, 1979.
4- June 15, 1978.

040. Prior to flying an airplane solo, which of the following is one of the requirements that must be met by a pilot who holds a Commercial Pilot Certificate?

B11
1- Hold an instrument pilot rating.
2- Hold a Second-Class Medical Certificate issued within the preceding 12 months.
3- Satisfactorily complete a flight review or proficiency check within the preceding 24 months.
4- Accomplish three takeoffs and landings within the preceding 90 days.

041. The minimum number of takeoffs and landings that a pilot is required to have made prior to acting as pilot in command of an airplane with passengers aboard is

B11
1- ten.
2- six.
3- five.
4- three.

042. If the pilot in command does not meet the night recency of experience requirement, and official sunrise is 0630 CDT, the earliest time of takeoff with passengers aboard should be

B11
1- 0730 CDT.
2- 0700 CDT.
3- 0630 CDT.
4- 0530 CDT.

043. To meet the recent flight experience requirements for acting as pilot in command when carrying passengers at night, a pilot must have made within the preceding 90 days and at night, at least

B11
1- three takeoffs and three landings (either full stop or touch-and-go).
2- three touch-and-go landings in the same category and class of aircraft to be used.
3- three takeoffs and three landings to a full stop in the same category, but not necessarily in the same class of aircraft to be used.
4- three takeoffs and three landings to a full stop in the same category and class of aircraft to be used.

044. Before acting as pilot in command of a large airplane that requires more than one pilot crewmember, a pilot must be type-rated for that specific type airplane and have satisfactorily completed a proficiency or flight check in that type airplane, or an approved simulator, within the preceding

B12
1- 36 months.
2- 24 months.
3- 12 months.
4- 6 months.

045. When a certificated pilot changes permanent mailing address and fails to notify the FAA Airman Certification Branch of the new address, the pilot is entitled to exercise the privileges of the pilot certificate for a period of only

B14
1- 60 days after the date of the move.
2- 30 days after the date of the move.
3- 20 days after the date of the move.
4- 10 days after the date of the move.

046. To act as pilot in command of an airplane towing a glider, the pilot is required to have

B15
1- a Commercial Pilot Certificate with a glider pilot rating.
2- at least a Private Pilot Certificate with a glider pilot rating.
3- a logbook record of having made at least three flights in a glider.
4- logbook endorsements for receipt of ground and flight instruction in gliders and familiarity with techniques and procedures for glider towing.

047. Suppose when receiving radar vectors you see an airplane approaching on a collision course from your left. Under these circumstances, you should

C01
1- wait for the other pilot to abide by regulations and give way to you.
2- wait until ATC issues a new heading or altitude that will ensure adequate separation.
3- not deviate from the heading or altitude assigned unless deviation is approved by ATC.
4- take whatever action is necessary to avoid a collision.

048. As part of the preflight action for a VFR flight away from the vicinity of the departure airport, the pilot in command is required to

C03
1- remove any portable electronic device that might interfere with navigation equipment.
2- determine runway lengths of airports of intended use and the airplane's takeoff and landing distance data.
3- file a flight plan if the flight will enter a Terminal Control Area.
4- check the operation of the emergency locator transmitter.

049. Which statement is true regarding the fastening of seatbelts?

C10
1- All persons on board must have their seatbelts fastened during the entire flight.
2- Seatbelts must be fastened about passengers during takeoff and landing only, while required flight crewmembers' seatbelts must be fastened during the entire flight.
3- Seatbelts must be fastened about passengers during takeoffs and landings only, while each required crewmember's seatbelt must be fastened at all times while occupying an assigned station.
4- Seatbelts must be fastened about passengers and required flight crewmembers during takeoff and landing only.

050. Which of the following is required when operating an aircraft towing a glider?

C12
1- A glider pilot rating on the pilot in command's pilot certificate.
2- A Special Purpose Airworthiness Certificate issued by the FAA Administrator.
3- Approval from ATC to tow the glider in a Control Zone.
4- A certificate of waiver issued by the Administrator.

051. Which of the following is required to operate an aircraft towing an advertising banner?

C12
1- A certificate of waiver issued by the Administrator.
2- Approval from ATC to operate in a control area.
3- A record of training in towing for the pilot in command.
4- A safety link at each end of the towline which has a breaking strength not less than 80% of the aircraft's gross weight.

052. An airplane is required to be equipped with an operable Mode A 4096 transponder with automatic pressure altitude reporting capability when operating in

C15
1- controlled airspace above 10,000 feet MSL.
2- controlled airspace above 12,500 feet MSL.
3- all airspace above 12,500 feet MSL that is not in the Continental Control Area.
4- all airspace above 10,000 feet MSL.

053. No person is permitted to operate a civil airplane unless that airplane has within it certain items, including the

C18
1- weight and balance information.
2- record of Airworthiness Directives.
3- airplane and engine logbooks.
4- Alteration and Repair Form 337.

054. To act as pilot in command of an airplane in a passenger-carrying airlift sponsored by a charitable organization, a private pilot is required to have

B16
1- special authorization from the FAA.
2- logged at least 200 hours of flight time.
3- at least 100 hours of pilot in command time.
4- an instrument pilot rating, if the flights extend beyond a 25-mile radius.

055. To carry passengers for hire on cross-country flights of more than 50 nautical miles from the departure airport, a pilot who is certificated after November 1974, is required to hold at least a Commercial Pilot Certificate and

B17
1- an instrument rating.
2- a First-Class Medical Certificate.
3- a Category "A" pilot authorization.
4- a Category II pilot authorization.

056. What limitation is imposed on a newly certificated commercial pilot if that person does not hold an instrument pilot rating?

B17
1- The carrying of passengers for hire on cross-country flights is limited to 50 NM and the carrying of passengers for hire at night is prohibited.
2- The carrying of passengers or property for hire on cross-country flights at night is limited to a radius of 50 NM.
3- The carrying of passengers for hire on cross-country flights is limited to 50 NM for night flights but not limited for day flights.
4- The person is limited to private pilot privileges.

057 Suppose a pilot attains a Commercial Pilot Certificate with an airplane rating after November 1974. If that pilot does not hold an instrument pilot rating, which of the following is prohibited?

B17
1- Carrying passengers on day local flights.
2- Carrying property for hire at night.
3- Carrying passengers for hire at night.
4- Carrying property for hire on cross-country flights of more than 50 nautical miles.

058. If a pilot is issued a Commercial Pilot Certificate with an airplane rating after November 1974, and that pilot does not hold an instrument pilot rating, which of the following is prohibited?

B17
1- Carrying property for hire day or night.
2- Carrying property for hire at night.
3- Carrying passengers on cross-country flights.
4- Carrying passengers for hire at night or for hire on cross-country flights of more than 50 nautical miles.

059. During a night VFR flight in a single-engine land airplane carrying passengers for hire within 25 nautical miles from the departure airport, regulations require that the pilot in command possess at least

B17
1- a Private Pilot Certificate with a single-engine land airplane rating.
2- an Airline Transport Pilot Certificate with a single-engine land airplane rating.
3- a Commercial Pilot Certificate with a single-engine land airplane rating.
4- a Commercial Pilot Certificate with a single-engine land airplane rating and an airplane instrument pilot rating.

060. Suppose a pilot attains a Commercial Pilot Certificate with airplane rating after November 1974. To carry passengers for hire at night in an airplane, that pilot is also required to hold at least

B17
1- a First-Class Medical Certificate.
2- an airplane instrument pilot rating.
3- a type rating if the airplane is of the multiengine class.
4- a Third-Class Medical Certificate that was issued within the preceding 12 calendar months.

061. When an airplane is being flown over water, under which circumstance must approved flotation gear be readily available to each occupant?

C23
1- When operating for hire regardless of the distance from shore.
2- When flying beyond power-off gliding distance from shore, whether operating for hire or not.
3- When on a personal flight more than 50 miles from shore.
4- When operating for hire beyond power-off gliding distance from shore.

062. Which of the following is normally prohibited when operating a restricted category civil aircraft?

C28
1- Flight under instrument flight rules.
2- Flight over a densely populated area.
3- Flight within a control zone.
4- Flight within the Continental Control Area.

063. A certificated commercial pilot is permitted to carry persons or property for compensation or hire in which of the following aircraft?

C28
1- Restricted, utility, and limited category aircraft.
2- Limited category aircraft.
3- Utility category aircraft.
4- Restricted category aircraft.

064. An altitude alerting system or device is required to be installed in the aircraft when operating which of the following?

C34
1- All turbojet airplanes.
2- All airplanes operating under IFR.
3- All transport type aircraft.
4- All large airplanes.

065. Which of the following is required equipment in an airplane used for all cross-country training flights outside a radius of 50 miles from the airport of departure?

C35
1- Two-way VHF communication radio.
2- 4096 transponder.
3- Emergency Locator Transmitter (ELT).
4- Distance Measuring Equipment (DME).

066. What is the maximum distance from the airport that an airplane engaged in training operations may be operated without an ELT?

C35
1- 75 miles.
2- 50 miles.
3- 25 miles.
4- 10 miles.

067. If the batteries of the Emergency Locator Transmitter (ELT) have a specified useful life of 18 months, by the end of what period are they required to be replaced or recharged?

C35
1- 9 months.
2- 12 months.
3- 16 months.
4- 18 months.

068. When are the batteries of an Emergency Locator Transmitter (ELT) required to be replaced?

C35
1- Annually.
2- Every 24 months.
3- At the time of each 100-hour or annual inspection.
4- When 50% of their useful life expires or they were in use for 1 hour.

069. Which statement is true with respect to formation flights?

D02
1- Formation flights must be performed above 1,500 feet AGL.
2- Formation flights are not permitted within controlled airspace.
3- Formation flights are prohibited when carrying passengers for hire.
4- Parachutes are required to be worn during formation flights.

070. In which type of airspace do regulations establish a maximum allowable indicated airspeed?

D04
1- Continental Control Area.
2- Positive Control Area.
3- Airspace below 10,000 feet MSL.
4- Control Zone above 10,000 feet MSL.

071. No person is permitted to operate a civil airplane unless that airplane has within it certain forms, including at least the

C18
1- operating limitations, the Registration Certificate, and an appropriate, current, and properly displayed Airworthiness Certificate.
2- operating limitations and an Aircraft Use and Inspection Report, FAA Form 8320-3.
3- aircraft and engine logbooks, and the Registration Certificate.
4- Repair and Alteration Form 337, and the Registration Certificate.

072. If an unpressurized airplane is operated at 15,500 feet MSL for 1 hour 30 minutes, who is required to use supplemental oxygen while at that altitude?

C22
1- The pilot in command but only for 1 hour.
2- The flight crew and the passengers during the entire time.
3- All occupants but only for the time exceeding 30 minutes.
4- The required minimum flight crew but not the passengers.

073. While operating above FL 250, occupants of a pressurized cabin airplane must have, in addition to that required for unpressurized airplanes, a supply of supplemental oxygen capable of lasting for a minimum of

C22
1- 30 minutes.
2- 20 minutes.
3- 10 minutes.
4- 5 minutes.

074. If you plan to fly an unpressurized airplane at 13,500 feet MSL for 1 hour 30 minutes, what minimum supply of supplemental oxygen is required by regulations?

C22
1- 30-minutes' supply for all occupants.
2- 1-hour 30-minutes' supply for all occupants.
3- 1-hour supply for the required minimum flight crew.
4- 20-minutes' supply for the required minimum flight crew.

075. If an unpressurized airplane is operated at 13,500 feet MSL for 50 minutes, how long during that time is the minimum flight crew required to use supplemental oxygen?

C22
1- 50 minutes.
2- 30 minutes.
3- 20 minutes.
4- 10 minutes.

076. If an unpressurized airplane is operated at 13,500 feet MSL for 1 hour 30 minutes, how long during that time is the minimum flight crew required to use supplemental oxygen?

C22
1- 20 minutes.
2- 30 minutes.
3- 1 hour.
4- 1 hour 30 minutes.

077. If an unpressurized airplane is operated at 14,500 feet MSL for 1 hour 30 minutes, how long during that time is the minimum flight crew required to use supplemental oxygen?

C22
1- 1 hour 30 minutes.
2- 1 hour.
3- 30 minutes.
4- 20 minutes.

078. Regulations require that supplemental oxygen be provided to each occupant when the airplane is operated above a cabin pressure altitude of

C22
1- 12,500 feet MSL.
2- 14,000 feet MSL.
3- 14,500 feet MSL.
4- 15,000 feet MSL.

079. If one pilot vacates an assigned station at the controls during flight in a pressurized airplane, above what altitude or flight level is the remaining pilot at the controls required to put on and use an oxygen mask?

C22
1- FL 350.
2- FL 240.
3- FL 180.
4- 15,000 feet.

080. The minimum altitude at which an airplane may be operated over a structure which is located in a sparsely populated area, is

D09
1- 1,000 feet above the ground.
2- 1,000 feet above the structure.
3- 500 feet above the ground.
4- 500 feet above the structure.

081. When descending from very high cruising "flight levels," such as FL 250, upon leaving what altitude is it first required that the barometric scale be changed from 29.92" Hg to the reported altimeter setting?

D10
1- 17,000 feet MSL.
2- 18,000 feet MSL.
3- 10,000 feet MSL.
4- 14,500 feet MSL.

082. During a cruising flight at certain high altitudes, the "flight level" is determined by setting the altimeter to

D10
1- 30.00" Hg.
2- 29.92" Hg.
3- 28.82" Hg.
4- the reported altimeter setting of the nearest station.

083. As defined by Federal Aviation Regulations, heights for cruising flight are referred to as "flight levels," starting upward from

D10
1- 18,000 feet AGL.
2- 18,000 feet MSL.
3- 29,000 feet AGL.
4- 29,000 feet MSL.

084. What type of airspeed at the planned cruise altitude should be entered on a flight plan?

D11
1- Estimated groundspeed.
2- Indicated airspeed.
3- True airspeed.
4- Calibrated airspeed.

085. Select the true statement pertaining to Airport Traffic Areas.

D12
1- To operate within these areas, the pilot must possess at least a Private Pilot Certificate.
2- These areas should be avoided unless landing or taking off from airports within the areas, or unless otherwise authorized by Air Traffic Control.
3- Airport Traffic Areas are depicted on Sectional Aeronautical Charts by a broken line circle.
4- When passing over these areas, aircraft are required to be at least 4,000 feet above the surface.

086. When entering an airport traffic area, what is the minimum altitude at which a turbine-powered or large aircraft may be flown until further descent is required for a safe landing?

D13
1- 2,000 feet.
2- 1,500 feet.
3- 1,000 feet.
4- 500 feet.

087. Concerning operations within an Airport Traffic Area, when is ATC authorization required?

D13
1- When landing at the tower-controlled airport only, but not when flying through that area.
2- When landing at any airport within that area, but not when flying through that area.
3- When landing at any airport within that area, as well as when flying through that area.
4- When landing only at the tower-controlled airport, and when flying through that area.

088. Unless otherwise authorized, two-way radio communications with Air Traffic Control is required at all times when operating within which of the following designated airspaces?

D13
1- Control Areas.
2- Control Zones.
3- Airport Advisory Areas.
4- Airport Traffic Areas.

089. Unless otherwise authorized, the maximum speed at which a reciprocating engine equipped aircraft should be flown within an Airport Traffic Area is

D04
1- 156 knots.
2- 180 knots.
3- 200 knots.
4- 288 knots.

090. Match the following maximum permissible airspeeds for reciprocating engine aircraft to the airspace in which the speeds apply.

(A) Airport Traffic Areas (located outside TCAs).

(B) Airport Traffic Areas (located inside TCAs).

(C) Beneath the lateral limits of TCAs.

(D) Below 10,000 feet MSL.

a. 156 knots.
b. 180 knots.
c. 200 knots.
d. 250 knots.

The correct matching is

D04
1- A-b; B-a; C-d; D-c.
2- A-b; B-c; C-d; D-c.
3- A-a; B-a; C-c; D-d.
4- A-a; B-d; C-c; D-d.

091. Unless otherwise authorized, what is the maximum speed at which a turbine powered aircraft should be flown within an Airport Traffic Area which is not in a Terminal Control Area?

D04
1- 156 knots.
2- 200 knots.
3- 230 knots.
4- 288 knots.

092. When flying beneath the lateral limits of a Terminal Control Area, the maximum speed authorized is

D04
1- 250 knots.
2- 200 knots.
3- 180 knots.
4- 156 knots.

093. Unless otherwise authorized, the maximum speed allowed when flying below 10,000 feet MSL is

D04
1- 288 knots.
2- 250 knots.
3- 200 knots.
4- 180 knots.

094. What is the maximum permissible indicated airspeed for operating a reciprocating engine airplane in an Airport Traffic Area which is located within a Terminal Control Area?

D04
1- 250 knots.
2- 200 knots.
3- 180 knots.
4- 156 knots.

095. Position lights are required to be displayed on all aircraft in flight from

D06
1- 1 hour before sunset to 1 hour after sunrise, and any time the flight visibility is less than 1 mile.
2- 1 hour before sunset to 1 hour after sunrise.
3- 30 minutes before sunset to 30 minutes after sunrise.
4- sunset to sunrise.

096. Suppose an airplane is being flown before sunrise and official sunrise is 0730. When are the airplane position lights required to be lighted?

D06
1- The position lights must remain lighted until 0630.
2- The position lights need not be lighted after 0700.
3- The position lights must remain lighted until 0730.
4- The position lights must remain lighted until 0800.

097. With respect to aircraft on the surface, what does a flashing green light signal from the control tower mean?

D08
1- Taxi clear of runway in use.
2- Exercise extreme caution.
3- Cleared to taxi.
4- Cleared for takeoff.

098. An alternating red and green light signal from the control tower to an aircraft in flight is an indication that the pilot should

D08
1- give way to other aircraft and continue circling.
2- execute a missed approach.
3- exercise extreme caution.
4- depart the traffic pattern and await further instructions.

099. To operate within Control Zones, the pilot is required to obtain a clearance from

D25
1- the FSS at all times prior to entering such airspace.
2- ATC prior to entering such airspace, regardless of the weather conditions.
3- ATC prior to entering such airspace, only when the weather is less than basic VFR.
4- no one, regardless of weather conditions, since such airspace has no control tower.

100. During which of these situations is prior authorization from ATC required to operate an airplane within a Control Zone?

D25
1- When surface weather conditions in the zone are less than VFR minimums, even if operating above the clouds.
2- When operating within the zone, regardless of weather conditions.
3- When operating within the zone beneath a 1,000-foot ceiling.
4- When operating within the zone in weather conditions that are classified as marginal VFR.

101. Between what altitudes is the pilot required to maintain a minimum of 500 feet below or 1,000 feet above any cloud formation during VFR flights in both controlled and uncontrolled airspace?

D25
1- 1,200 feet AGL and 14,500 feet MSL.
2- 1,200 feet AGL and 10,000 feet MSL.
3- 700 feet AGL and 14,500 feet MSL.
4- 700 feet AGL and 12,500 feet MSL.

102. When operating an airplane under basic VFR in uncontrolled airspace at an altitude of less than 1,200 feet above the surface, the flight visibility should be at least

D25
1- 5 statute miles.
2- 3 statute miles.
3- 2 statute miles.
4- 1 statute mile.

103. With regard to visibility and airspeed limitations when operating under basic VFR more than 1,200 feet above the surface and at or above 10,000 feet MSL, the flight visibility must be at least

D25
1- 5 miles, and the indicated airspeed must be less than 250 knots.
2- 5 miles, and the indicated airspeed may be greater than 250 knots.
3- 3 miles, and the indicated airspeed must be less than 250 knots.
4- 3 miles, and the indicated airspeed may be greater than 250 knots.

104. To depart under basic VFR weather minimums from an airport that is located within a Control Zone, the weather at that airport must be

D25
1- a ceiling of 1,000 feet or more, and a visibility of at least 3 miles.
2- a visibility of at least 1 mile, regardless of the ceiling.
3- a ceiling that would permit flight at 500 feet below the clouds, and a visibility of 3 miles.
4- such that the pilot can remain clear of clouds and have 1 mile visibility, regardless of the ceiling.

105. Which one of the following designated airspaces requires that two-way radio communications be maintained with ATC, only when the weather is less than VFR minimums?

D25
1- Control Zone.
2- Airport Traffic Area.
3- Airport Advisory Area.
4- Terminal Control Area.

106. When operating an airplane within a Control Zone under Special Visual Flight Rules, the flight visibility is required to be at least

D26
1- 1 statute mile.
2- 2 statute miles.
3- 3 statute miles.
4- 5 statute miles.

107. Suppose an airport without a control tower lies within the Airport Traffic Area of an airport that has an operating tower. According to regulations, ATC authorization is required to land at

D13
1- the tower-controlled airport only, but not required to fly through the area.
2- either airport, as well as to fly through the area.
3- the tower-controlled airport only, as well as to fly through the area.
4- either airport, but not required to fly through the area.

108. When considering Terminal Control Areas (TCAs), pilots should know that

D15
1- all pilots operating within TCAs are required to file a flight plan.
2- operable transponders are required when operating within all TCAs.
3- takeoffs and landings within Group I TCAs are not authorized unless the pilot holds at least a Private Pilot Certificate.
4- VFR operations are not authorized within Group I TCAs.

109. For an airplane with no radar beacon transponder to be operated within a Group III Terminal Control Area, it is required that

D15
1- the airplane be operating on an IFR flight plan.
2- the Group III Terminal Control Area have a Radar Approach Control.
3- prior to entry, the pilot inform ATC of the airplane's position, altitude, and proposed flightpath.
4- the airplane be equipped with Distance Measuring Equipment.

110. Unless otherwise authorized, an airplane operated under VFR within a Group II Terminal Control Area is required to be equipped with an operable

D15
1- ILS receiver and a 4096 transponder with Mode C capability.
2- VOR or TACAN receiver and a 4096 transponder.
3- DME receiver and at least a 64-code transponder.
4- TACAN receiver and a 64-code transponder.

111. Unless otherwise authorized, an airplane that is being operated within a Group I Terminal Control Area is required to be equipped with an operable

D15
1- ADF receiver and VOR receiver.
2- ILS receiver and marker beacon receiver.
3- 4096 radar beacon transponder with automatic altitude reporting capability.
4- radar beacon transponder with 64-code capability.

112. Which statement is true regarding VFR operations in "Terminal Control Areas (TCAs)?"

D15
1- Flight plans are required to be filed prior to operating within Group II TCAs.
2- Solo student pilots are not authorized to take off or land at airports that are located within Group I TCAs.
3- When operating within Group II TCAs, VOR receivers are not required.
4- Flight under Visual Flight Rules is not permitted within Group I TCAs.

113. With regard to operating an airplane within a Group I Terminal Control Area, which of the following statements is true?

D15
1- The airplane must be equipped with an operable VOR receiver, two-way communications radio, and a radar beacon transponder.
2- The pilot in command must hold at least a Commercial Pilot Certificate.
3- The pilot in command must hold an instrument pilot rating, and be prepared to be vectored through clouds when necessary.
4- All of the above requirements must be met.

114. In which type of airspace are flights under VFR prohibited at all times?

D19
1- Continental Control Area.
2- Control Zone.
3- Positive Control Area.
4- Terminal Control Area.

115. When operating under VFR at more than 3,000 feet AGL, cruising altitudes to be maintained are based upon the

D27
1- true heading being flown.
2- true course being flown.
3- magnetic course being flown.
4- magnetic heading being flown.

116. When is a transponder in an airplane required to be tested, inspected, and found to comply with regulations?

D37
1- Every 12 months if the airplane is operated for compensation or hire.
2- Within 24 months prior to use.
3- Every 36 months if the airplane is flown in noncommercial operations.
4- Each time the airplane receives an annual inspection.

117. An ATC transponder installed in an airplane must be tested, inspected, and found to comply with regulations before it can be used for operations under Part 91 on

D37
1- VFR or IFR flights in all airspace.
2- IFR flights only, within controlled airspace.
3- VFR flights only, within Terminal Control Areas.
4- VFR or IFR flights, but only below 12,500 feet MSL.

118. An ATC transponder installed in an airplane is not permitted to be used in the U.S.A. unless it has been tested, inspected, and found to comply with regulations within the preceding

D37
1- 24 calendar months.
2- 12 calendar months.
3- 10 hours' time in service.
4- 10 days.

119. If an ATC transponder installed in an airplane has not been tested, inspected, and found to comply with regulations within a specified period, what is the limitation on its use?

D37
1- Its use is not permitted at all.
2- Its use is permitted for VFR flight but not for IFR.
3- Its use is permitted when outside controlled airspace.
4- Its use is permitted anywhere except in Terminal Control Areas.

120. Which statement is true pertaining to Airworthiness Directives (ADs) for a specific airplane?

E01
1- If the provisions of an AD have not been complied with, the airplane is not considered to be airworthy.
2- Maintenance personnel are personally responsible to see that all ADs are complied with.
3- There is no requirement to record compliance with ADs.
4- ADs are nonregulatory in nature.

121. Airworthiness Directives (ADs) issued for a given airplane, engine, or propeller are considered to be

E02
1- Advisories to Airmen.
2- Advisory Circulars.
3- Service Bulletins.
4- Federal Aviation Regulations.

122. Who is primarily responsible for seeing that an aircraft Airworthiness Directive is complied with?

E02
1- The FAA District Office.
2- The owner or operator of that aircraft.
3- The maintenance personnel responsible for inspections.
4- The pilot in command of that aircraft.

123. Unless the airplane's 100-hour or annual inspections are repeated or superseded by other inspections, the records of those inspections must be retained by the owner or operator for what period of time?

E02
1- 6 months.
2- 1 year.
3- 2 years.
4- The airplane's lifespan.

124. If an alteration or repair substantially affects an airplane's operation in flight, that airplane must be test flown and approved for return to service by an appropriately-rated pilot prior to being operated

E03
1- for compensation or hire.
2- with passengers aboard.
3- away from the vicinity of the airport.
4- by a private pilot.

125. When operating an airplane beneath the ceiling within a Control Zone under Special VFR, what minimum distance from clouds and what visibility are required?

D26
1- 500 feet beneath clouds, and the ground visibility must be at least 1 mile.
2- 500 feet beneath clouds, and the flight and ground visibility must be at least 3-5 miles (marginal VFR).
3- Clear of clouds, and the flight visibility must be at least 1 mile.
4- Clear of clouds, and the ground visibility must be at least 2 miles.

126. To operate an airplane under Special VFR within a Control Zone at night, which of the following is required?

D26
1- The pilot must hold an instrument pilot rating and the airplane must be equipped for instrument flight.
2- The Control Zone must be specifically designated as a night Special VFR Control Zone.
3- The ceiling within the Control Zone must be at least 500 feet.
4- The Control Zone must have an approach control facility.

127. When operating an airplane within a Control Zone at night under Special Visual Flight Rules, the pilot in command is required to hold at least

D26
1- a Second-Class Medical Certificate.
2- a Student Pilot Certificate with a flight instructor endorsement for night flying.
3- an airplane instrument pilot rating.
4- a Commercial Pilot Certificate.

128. Which of the following is a requirement for operating an airplane between sunset and sunrise under Special VFR in a Control Zone?

D26
1- The airplane must be equipped for IFR flight.
2- The flight visibility must be at least 3 miles.
3- The pilot must hold at least a Commercial Pilot Certificate.
4- The flight must be able to remain at least 500 feet below the clouds.

129. Suppose the following factors exist when choosing VFR cruising altitudes for a flight where ground elevation is 2,000 feet MSL.

	Leg I	Leg II
True Course	193°	183°
Wind Correction Angle .	5° R	3° L
Magnetic Variation . .	4° E	5° E
Magnetic Deviation	+3°	+4°

Select the cruising altitudes that would comply with regulations on Leg I and Leg II.

D27
1- 6,500 feet MSL on both legs.
2- 6,500 feet MSL on Leg I; 7,500 feet MSL on Leg II.
3- 7,500 feet MSL on both legs.
4- 7,500 feet MSL on Leg I; 6,500 feet MSL on Leg II.

130. The altitudes required to be maintained during VFR cruising flight are based on the

D27
1- magnetic course being flown, and they begin at 3,000 feet above mean sea level.
2- magnetic course being flown, and they begin more than 3,000 feet above the surface.
3- true course being flown, and they begin at more than 3,000 feet above the surface.
4- true course being flown, and they begin at 3,000 feet above mean sea level.

131. Suppose the following factors exist when choosing VFR cruising altitudes where the ground elevation is 1,500 feet MSL.

	Leg I	Leg II
True Course	183°	185°
Wind Correction Angle .	3° R	5° L
Variation	5° E	4° E
Deviation	+4°	+3°

Select the cruising altitudes that could be used on Leg I and Leg II to comply with regulations.

D27
1- Leg I, 8,500 feet MSL; Leg II, 7,500 feet MSL.
2- Leg I, 7,500 feet MSL; Leg II, 8,500 feet MSL.
3- Both Leg I and Leg II, 8,500 feet MSL.
4- Both Leg I and Leg II, 7,500 feet MSL.

132. Which of the following operations is governed by FAR, Part 135?

G01
1- Student instruction, ferry flights, and aerial work operations such as chemical applications and pipeline patrol.
2- Air carrier operations and emergency mail service conducted under the Federal Aviation Act of 1958.
3- Nonstop sightseeing flights that begin and end at the same airport and do not exceed a 25-mile radius.
4- Operations that carry persons in air commerce for compensation or hire in small aircraft.

133. Part 135, Air Taxi and Commercial Operators of Small Aircraft, prescribes rules governing

G01
1- student instruction flights.
2- sightseeing flights within a 25-mile radius of the airport.
3- the transportation of mail conducted under a "star route" contract.
4- aerial photography or survey operations.

134. Of the following incidents, which would require that the nearest field office of the National Transportation Safety Board be notified immediately?

H03
1- A near midair collision.
2- Damage to a landing gear.
3- An in-flight generator/alternator failure.
4- Flight control system malfunction or failure.

135. The nearest field office of the National Transportation Safety Board should be notified immediately if which of the following incidents occurs?

H03
1- When an overdue aircraft is thought to have been involved in an accident.
2- When evasive action is taken to avoid a midair collision.
3- When damage to the landing gear or wheels occurs.
4- When damage limited to the wingtips occurs.

136. Certain aircraft incidents are required to be reported immediately to the nearest field office of the National Transportation Safety Board. Of the following incidents, which would require this immediate notification?

H03
1- Damage to a landing gear.
2- A near midair collision.
3- An in-flight generator failure.
4- An in-flight fire.

137. To comply with the National Transportation Safety Board regulation, Part 830, which of the following circumstances would require that the NTSB field office be notified immediately?

H03
1- Any damage to the landing gear resulting from a hard landing.
2- Any violent evasive action necessary to avoid a midair collision.
3- The inability of any required flight crewmembers to perform their normal flight duties because of in-flight illness.
4- Generator failure in flight because of damaged engine accessories.

138. The nearest field office of the National Transportation Safety Board should be notified immediately if which of the following occurs?

H03
1- An in-flight generator/alternator failure.
2- Ground damage to the propeller.
3- An in-flight collision with another aircraft.
4- Engine failure.

139. FAA Advisory Circulars (some free, others at cost) are available to all pilots and are obtained by

I01
1- distribution from the nearest FAA District Office.
2- ordering those desired.
3- subscribing to the Federal Register.
4- subscribing to Federal Aviation Regulations.

140. When is an airplane required to be test flown prior to being returned to service and prior to carrying passengers?

E03
1- At the completion of each 100-hour or annual inspection of the airplane.
2- When the engine has been overhauled or replaced.
3- When additional equipment has been installed in the airplane.
4- When a repair or alteration has changed the airplane's flight or operating characteristics.

141. If the last 100-hour inspection for an aircraft which is used to carry persons for hire was exceeded by 5 hours, the next inspection is due within how many hours' time in service?

E04
1- 105 hours.
2- 100 hours.
3- 95 hours.
4- 90 hours.

142. Suppose an airplane has 1,525 hours' time in service when it receives a 100-hour inspection. If the inspection was 10 hours overdue, when is the next 100-hour inspection due?

E04
1- 1,605 hours.
2- 1,615 hours.
3- 1,635 hours.
4- 1,625 hours.

143. Which of these operations is prohibited if the airplane being used has not had a 100-hour inspection or annual inspection within the preceding 100 hours' time in service?

E04
1- Giving flight instruction for hire.
2- Carrying property for hire.
3- Conducting any commercial operation.
4- Passenger carrying, either for hire or not for hire.

144. Which of the following is true concerning the required maintenance inspections?

E04
1- An annual inspection may be substituted for a 100-hour inspection.
2- An annual inspection is required even if a progressive inspection system has been approved.
3- It is not permissible to substitute one inspection for another.
4- A 100-hour inspection may be substituted for an annual inspection.

145. Suppose the maintenance records of the aircraft show that an annual inspection was completed on January 3, 1978. The next required 100-hour inspection will be due no later than

E04
1- January 31, 1979.
2- December 31, 1979.
3- the next 100 hours in service.
4- 12 calendar months from the date shown on the Airworthiness Certificate.

146. An aircraft maintenance record is required to contain certain information. What information is required to be kept for an indefinite period of time?

E06
1- Description of work performed.
2- Total airframe time-in-service.
3- Completion date of work performed.
4- The signature of the person approving the aircraft for return to service.

147. When an aircraft is being sold, what maintenance record information is required to accompany that aircraft?

E06
1- A description of all work performed on the aircraft.
2- The current status of all applicable Airworthiness Directives.
3- The completion dates of all maintenance performed on the aircraft.
4- A record of all preventive maintenance performed.

148. When operating an airplane which has a certificated takeoff gross weight of less than 12,500 pounds, from one state to another while carrying passengers for hire, the operation is subject to the provisions of

G01
1- FAR Part 91, General Operating and Flight Rules only.
2- FAR Part 123, Certification and Operations: Air Travel Clubs Using Large Aircraft.
3- FAR Part 121, Certification and Operations: Air Carrier and Commercial Operators of Large Aircraft.
4- FAR Part 135, Air Taxi Operators and Commercial Operators of Small Aircraft.

149. What does a series of arrows painted on the approach end of a runway signify?

J02
1- That portion of the runway is not suitable for landing.
2- That runway is a precision instrument approach runway.
3- Landings and takeoffs on that runway must be made in the direction of the arrows.
4- That portion of the runway is the designated touchdown zone.

150. A closed runway is identified by which of the following?

J02
1- Red lights are placed at the approach end of the runway.
2- Yellow chevrons are painted on the runway beyond the threshold.
3- An "X" is painted on each end of the runway.
4- The letter "C" is painted after the runway number.

151. Which statement is true concerning the operation of DME?

J03
1- Distance information received from DME is the actual horizontal distance from the station.
2- DME operates on frequencies in the VHF spectrum.
3- Aircraft must have TACAN equipment to obtain distance information from a VORTAC.
4- DME coded identification is transmitted once for each four times the VOR coded identification of a VORTAC is transmitted.

152. Which statement is true concerning the distance information provided by DME?

J03
1- Distance information is the actual horizontal distance in statute miles.
2- Distance information is the slant range distance in nautical miles.
3- Distance information is the actual horizontal distance and may be in statute or nautical miles, depending on the airborne equipment.
4- Distance information is obtained automatically when a VOR receiver is tuned to a VORTAC.

153. With regard to the operational status of a VORTAC, if a coded identification is received only once every 30 1/2 seconds, it indicates that

J03
1- the DME component only is operative; the VOR component is inoperative.
2- the VOR component only is operative; the DME component is inoperative.
3- neither the VOR component nor the DME component is operating normally.
4- the facility uses voice identification and both VOR and DME components are operating normally.

154. Assume that an approach is being made to a runway equipped with a 2-bar Visual Approach Slope Indicator. The designated touchdown zone would be undershot if, throughout the approach, the pilot continued to observe the VASI lights as depicted in which illustration on page 43?

J04
1- A.
2- B.
3- C.
4- D.

155. Assume that a Standard FAA 2-bar VASI is in operation at the airport and the airplane is above the glide slope during the approach. Which illustration (page 43) would most likely depict this situation?

J04
1- Illustration D.
2- Illustration C.
3- Illustration B.
4- Illustration A.

156. If the color combinations shown in illustration A on page 43 were observed during an approach to a runway equipped with a 2-bar VASI, what action should be taken by the pilot?

J04
1- Increase the rate of descent.
2- Decrease the rate of descent.
3- Momentarily level off to intercept the glide slope.
4- Climb to intercept the glide slope.

157. Assume that a Standard FAA 2-bar VASI is in operation at an airport and the airplane is on the glide slope during the approach. Which illustration below would most likely depict this situation?

J04 1- Illustration A.
2- Illustration B.
3- Illustration C.
4- Illustration D.

158. Which color combination of lights below could not be observed while on final approach to a runway equipped with a Standard 2-bar VASI?

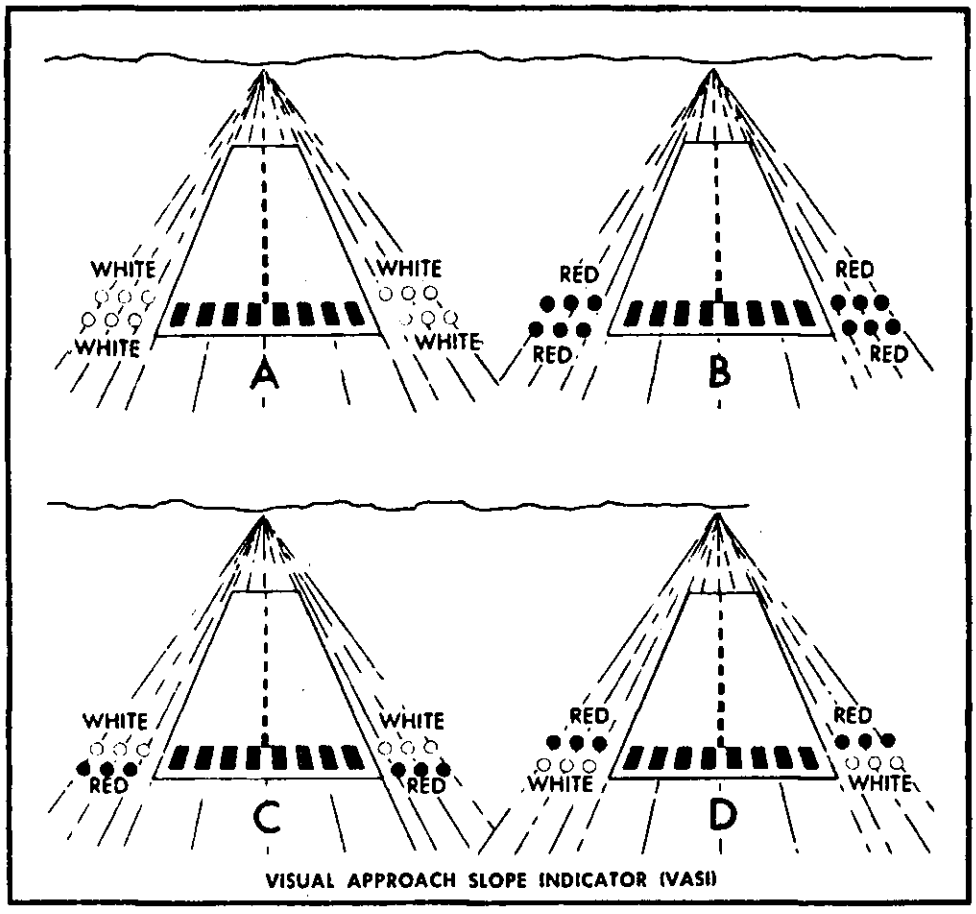
J04 1- A.
2- B.
3- C.
4- D.

159. The designated touchdown zone would be undershot if, throughout the final approach, the pilot continued to observe the VASI lights as depicted in which illustration below?

J04 1- A.
2- B.
3- C.
4- D.

160. Assume that an approach is being made to a runway equipped with a 2-bar Visual Approach Slope Indicator. The designated touchdown zone would be overshot if, throughout the approach, the pilot continued to observe the VASI lights as depicted in which illustration below?

J04 1- C.
2- A.
3- D.
4- B.



VISUAL APPROACH SLOPE INDICATOR (VASI)

DO NOT MARK ON THIS BOOK!

161. Within the conterminous United States, the floor of the Positive Control Area is located at

J05
1- 10,000 feet MSL.
2- 14,500 feet MSL.
3- 18,000 feet MSL.
4- 24,000 feet MSL.

162. The altitude of 18,000 feet MSL is considered to be which of the following?

J05
1- The base of the Positive Control Area.
2- The upper limit of Control Zones.
3- The base of the Continental Control Area.
4- The upper limit of Terminal Control Areas.

163. The altitude of 14,500 feet MSL is considered to be which of the following?

J05
1- The base of the Positive Control Area.
2- The upper limit of uncontrolled airspace.
3- The upper limit of the Continental Control Area.
4- The upper limit of Terminal Control Areas.

164. The altitude of 14,500 feet MSL is considered to be which of the following?

J05
1- The base of the Continental Control Area.
2- The base of the Positive Control Area.
3- The level at which Mode C transponders are required.
4- The upper limit of Terminal Control Areas.

165. A Transition Area that is designated in conjunction with an airport for which an instrument approach procedure has been prescribed, has a floor at

J05
1- the surface.
2- 700 feet AGL.
3- 1,200 feet AGL.
4- 3,000 feet AGL.

166. The purpose of designating certain airspace as "Transition Areas" is to

J05
1- enable ATC to control all flights within a given area.
2- separate a Control Zone from control areas.
3- extend the lateral limits of the Control Zone.
4- ensure that IFR flights can remain within controlled airspace for specific operations.

167. As standard operating practice, all inbound traffic to an airport without a control tower should continuously monitor the appropriate facility from a distance of

J06
1- 15 miles out.
2- 20 miles out.
3- 25 miles out.
4- 30 miles out.

168. Airspace established as "Warning Areas" are located

J07
1- in international airspace.
2- in the immediate vicinity of military bases.
3- where hazardous terrain exists.
4- along military low-altitude training routes.

169. Where are Warning Areas established?

J07
1- In mountainous areas.
2- Beyond the nation's 3 mile limit.
3- Surrounding large metropolitan cities.
4- In the vicinity of military bases.

170. Military Operations Areas (MOAs) consist of airspace of defined vertical and lateral limits and are established for the purpose of

J07
1- separating certain military training activities from IFR traffic.
2- military services conducting VFR low altitude navigation and tactical training, as well as flight testing.
3- denoting the existence of unusual hazards to aircraft, such as artillery firing, aerial gunnery, or guided missiles.
4- providing separation of VFR and IFR civil aircraft from military aircraft.

171. One could find nonregulatory material of aviation interest pertaining to the subject "Aircraft" under FAA Advisory Circular subject number

I02
1- 90.
2- 70.
3- 60.
4- 20.

172. FAA Advisory Circulars containing matter covering the subject "Airmen" are issued under which subject number?

I03
1- 20.
2- 60.
3- 70.
4- 90.

173. FAA Advisory Circulars containing matter covering the subject of "Airspace" are issued under which subject number?

I04
1- 20.
2- 60.
3- 70.
4- 90.

174. FAA Advisory Circulars containing subject matter specifically related to "Air Traffic Control and General Operations" are issued under which subject number?

J05
1- 90.
2- 70.
3- 60.
4- 20.

175. One could find nonregulatory material of aviation interest pertaining to the subject "Airports" under FAA Advisory Circular subject number

J07
1- 150.
2- 90.
3- 70.
4- 20.

176. During the after-landing roll at night on a runway which has in-runway lighting installed, if a series of red lights is seen in the centerline lighting, it indicates that

J02
1- 3,000 feet of runway remain.
2- 1,000 feet of runway remain.
3- one-half of the runway remains.
4- there are no taxiway turnoffs until the end of the runway is reached.

177. During the after-landing roll at night on a runway which has in-runway lighting installed, if a series of alternating red and white lights is seen in the centerline lighting, it indicates that

J02
1- 3,000 feet of runway remain.
2- 1,000 feet of runway remain.
3- one-half of the runway remains.
4- there are no taxiway turnoffs until the end of the runway is reached.

178. To identify a military airport at night the rotating beacon alternately flashes what colors?

J02
1- Green and white, with two quick white flashes between the green flashes.
2- White and green, with two quick green flashes between the white flashes.
3- Red and white, with two quick red flashes between the white flashes.
4- Yellow and white, with two quick white flashes between the yellow flashes.

179. Which of the following color combinations of a rotating beacon light would identify a military airfield?

J02
1- One white flash and then one green flash.
2- One white flash and then two green flashes.
3- Two quick white flashes and then one green flash.
4- One white flash and then two quick red flashes.

180. What is the relationship between the runway numbers and the wind direction given by control towers?

J02
1- Runway numbers are true direction while wind is given in magnetic direction.
2- Runway numbers are true direction and wind is given in true direction.
3- Runway numbers are magnetic direction while wind is given in true direction.
4- Runway numbers are magnetic direction and wind is given in magnetic direction.

181. Select the true statement regarding VFR flight plans.

J16
1- Control towers automatically forward VFR flight plan departure times to Flight Service Stations.
2- Search and rescue procedures are initiated if a VFR flight plan has not been revised or canceled after 1 hour past ETA.
3- Position reports are mandatory when operating on a filed VFR flight plan.
4- Control towers do not automatically close VFR flight plans.

182. When the hairs in the semicircular canals of the inner ear are deflected, the pilot may experience

J19
1- discomfort or pain on the ear drum.
2- spatial disorientation or vertigo.
3- hyperventilation.
4- hypoxia.

183. Which statement is true regarding carbon monoxide poisoning?

J19
1- A major early symptom of carbon monoxide poisoning is a sense of well-being.
2- Several days may be required to fully recover from carbon monoxide poisoning.
3- The human body has no built-in alarm system to alert one that carbon monoxide poisoning is occurring.
4- Minute quantities of carbon monoxide poisoning are considered harmless.

184. Which statement is true regarding the presence of alcohol within the human body?

J19
1- The human body metabolizes alcohol at a faster rate if bolstered with coffee.
2- Judgment and decision-making abilities can be adversely affected by small amounts of alcohol.
3- An increase in altitude decreases the adverse effect of alcohol.
4- A small amount of alcohol increases the keenness of vision.

185. Which of the following is a common symptom of hyperventilation?

J19
1- Tingling of the hands, legs, and feet.
2- An increased sense of well-being.
3- Increased vision keenness.
4- Decreased breathing rate.

186. Which of the following is a common symptom of hyperventilation?

J19
1- Dizziness.
2- Decreased breathing rate.
3- Euphoria - sense of well-being.
4- Slowed heart beat.

187. Which of the following would most likely result in hyperventilation?

J19
1- Insufficient carbon dioxide.
2- Excessive carbon monoxide.
3- Insufficient oxygen.
4- Excessive carbon dioxide.

188. Which of the following would most likely result in hyperventilation?

J19
1- Emotional tension, anxiety, or fear.
2- The excessive consumption of alcohol.
3- An extremely slow rate of breathing and insufficient oxygen.
4- An extreme case of relaxation or sense of well-being.

189. Which of the following statements is true relating to hypoxia?

J19
1- Hypoxia has no effect on night vision below an altitude of 10,000 feet.
2- Nonsmokers experience symptoms of hypoxia at lower levels than heavy smokers.
3- It is possible to predict when and at what flight level hypoxia will occur and how it will manifest itself.
4- The human body has no built-in alarm system to serve as a warning of the onset of hypoxia.

190. Which of the following requires the pilot to obtain special authorization prior to conducting VFR flights within the airspace?

J07
1- Warning Areas.
2- Military Operations Areas (MOA).
3- Restricted Areas.
4- Intensive Student Jet Training Areas (ISJTA).

191. Which of the following requires the pilot to obtain special authorization prior to conducting VFR flights within the airspace?

J07
1- Alert Areas.
2- Military Operations Areas.
3- Restricted Areas.
4- All of the above areas.

192. VFR flights are permitted within which of the following airspaces <u>without</u> special authorization?

J07
1- Airport Traffic Areas.
2- Airport Advisory Areas.
3- Restricted Areas.
4- Positive Control Areas.

193. Which of the following requires the pilot to obtain special authorization prior to conducting flights within the airspace during both VFR and IFR weather conditions?

J07
1- Control Zones.
2- Airport Traffic Areas.
3- Airport Advisory Areas.
4- Military Operations Areas (MOA).

194. Radar-equipped FAA Air Traffic Control facilities provide radar assistance to

J10
1- all aircraft within a 50 nautical mile radius of the radar site.
2- only those aircraft equipped with at least 4096 code capability transponder.
3- only those aircraft that can be identified by radar and have the equipment for communicating with the radar facility.
4- only those aircraft which are IFR equipped and flown by an instrument rated pilot.

195. Stage I service available under the Terminal Radar Program for VFR aircraft, provides

J11
1- traffic information and limited vectoring to VFR aircraft on a workload-permitting basis.
2- traffic information and headings to fly to join the traffic pattern or to a position behind the preceding aircraft in the approach sequence.
3- traffic information and positive control of all aircraft within the Terminal Control Area (TCA).
4- separation between participating VFR aircraft and all IFR aircraft within the Terminal Radar Service Area (TRSA).

196. Stage III service available under the Terminal Radar Program for VFR aircraft, provides

J11
1- traffic information and limited vectoring to VFR aircraft on a workload-permitting basis.
2- traffic information and headings to fly to join the traffic pattern or to a position behind the preceding aircraft in the approach sequence.
3- separation between participating VFR aircraft and all IFR aircraft within the Terminal Radar Service Area (TRSA).
4- traffic information and positive control of all aircraft within the Terminal Control Area (TCA).

197. Which statement is true regarding frequency assignments for UNICOM?

J12
1- 122.8 MHz is assigned only to airports <u>not</u> served by an FSS.
2- 123.0 MHz is assigned only to airports served by a control tower.
3- 122.8, 123.0, and 122.7 MHz are assigned to airports without an ATC tower or FSS.
4- 122.8 MHz is assigned to airports served by an FSS.

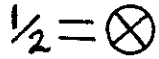
198. By referring to the isobars on a Surface Analysis (weather map), what can a person determine?

K01
1- Areas of magnetic variation.
2- Areas of precipitation.
3- Pressure gradient.
4- Temperature changes.

199. Which of the following provides a graphic display of both VFR and IFR weather?

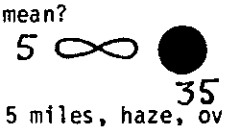
K02
1- Constant Pressure Chart.
2- Radar Summary Chart.
3- Surface Analysis.
4- Weather Depiction Chart.

200. On a weather depiction chart, what does this information mean?



K02
1- Visibility 1/2 mile, fog, sky partially obscured.
2- Visibility 1 to 2 miles, overcast, ceiling at 2,000 feet.
3- Overcast, ceiling between 1,000 and 2,000 feet.
4- Overcast, ceiling variable from 100 to 200 feet.

201. On a weather depiction chart, what does this information mean?



K02
1- Visibility 5 miles, haze, overcast, ceiling 3,500 feet.
2- Visibility 3 to 5 miles, dust, sky obscured.
3- Visibility 3 to 5 miles, sky obscured, ceiling 5,000 feet.
4- Visibility 5 miles, sky obscured.

202. On a weather depiction chart, areas enclosed by a scalloped line contain weather conditions that are classified as

K02
1- MVFR.
2- VFR.
3- IFR.
4- LIFR.

203. On a weather depiction chart, areas enclosed by a smooth solid line contain weather conditions that are classified as

K02
1- IFR.
2- VFR.
3- DVFR.
4- MVFR.

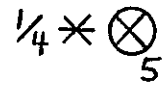
204. What is the maximum visibility that will be shown on a weather depiction chart?

K02
1- 3 miles.
2- 5 miles.
3- 6 miles.
4- 7 miles.

205. On a weather depiction chart, what does this information mean?

K02
1- Visibility unlimited, sky overcast, base of clouds variable 100 to 200 feet, wind calm.
2- Visibility 1/2 mile, snow, sky partially obscured.
3- Visibility 1 to 2 miles, blowing sand, sky overcast.
4- Visibility less than 1 mile, blowing dust, sky broken clouds.

206. On a weather depiction chart, what does this information mean?



K02
1- Sky obscured, ceiling 500 feet, visibility 1/4 mile, snow.
2- Sky broken clouds, ceiling variable from 400 feet to 1,000 feet, snow, wind 5 knots.
3- Sky overcast, ceiling variable from 400 feet to 1,000 feet, visibility 5 miles, dust.
4- Sky overcast, ceiling 400 feet with top at 1,000 feet, visibility 5 miles, snow.

207. On a weather depiction chart what weather conditions would be outlined by a scalloped line?

K02
1- Ceiling less than 1,000 feet and/or visibility less than 3 miles.
2- Ceiling between 5,000 and 7,000 feet and/or visibility between 5 and 7 miles.
3- Ceiling greater than 3,000 feet and/or visibility greater than 5 miles.
4- Ceiling between 1,000 and 3,000 feet and/or visibility between 3 and 5 miles.

208. The latest issue of which chart contains the most current information on communication and NAVAID frequencies of specific radio facilities?

J23
1- The appropriate World Aeronautical Chart.
2- The appropriate Sectional Aeronautical Chart.
3- The appropriate Low Altitude En Route Chart.
4- The appropriate Terminal Area Chart.

209. Which of these has the most lenient operating restrictions for VFR flights?

J26
1- Stage II TRSA.
2- Stage III TRSA.
3- Group I TCA.
4- Group II TCA.

210. Pilots using ATC radar services when operating under VFR within a Stage III Terminal Radar Service Area (TRSA) are

J26
1- relieved of the responsibility to avoid flying into clouds if assigned an altitude.
2- required to maintain assigned vectors in all situations.
3- expected to coordinate altitude changes with ATC even if an altitude has not been assigned.
4- allowed to fly just clear of clouds if necessary to comply with ATC instructions.

211. It is permissible to operate an airplane under VFR without a 4096 code transponder within

J26
1- Group II Terminal Control Areas (TCAs).
2- Stage III Terminal Radar Service Areas (TRSAs).
3- Continental Control Areas.
4- Group I Terminal Control Areas (TCAs).

212. ATC authorization is not required prior to operating within the boundaries of a

J26
1- Group I Terminal Control Area (TCA).
2- Group II Terminal Control Area (TCA).
3- Stage III Terminal Radar Service Area (TRSA).
4- Airport Traffic Area inside a TCA.

213. In addition to providing the surface location of fronts (as of map time), a Surface Analysis (weather map) also provides

K01
1- forecast positions of HIGHS, LOWS, and FRONTS.
2- the location and intensity of thunderstorm areas.
3- the type, character, and intensity of fronts.
4- an analysis of pressure patterns at the 400-millibar level.

214. What does this symbol mean on a Surface Analysis (weather map)?

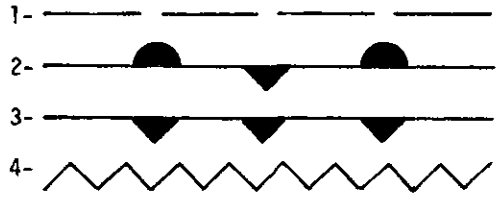
K01
1- Cold front aloft.
2- Occluded front.
3- High pressure ridge.
4- Squall line.

215. The intensity trend of a front (as of map time) is best determined by referring to a

K01
1- Radar Summary Chart.
2- Surface Analysis.
3- Constant Pressure Chart.
4- Weather Depiction Chart.

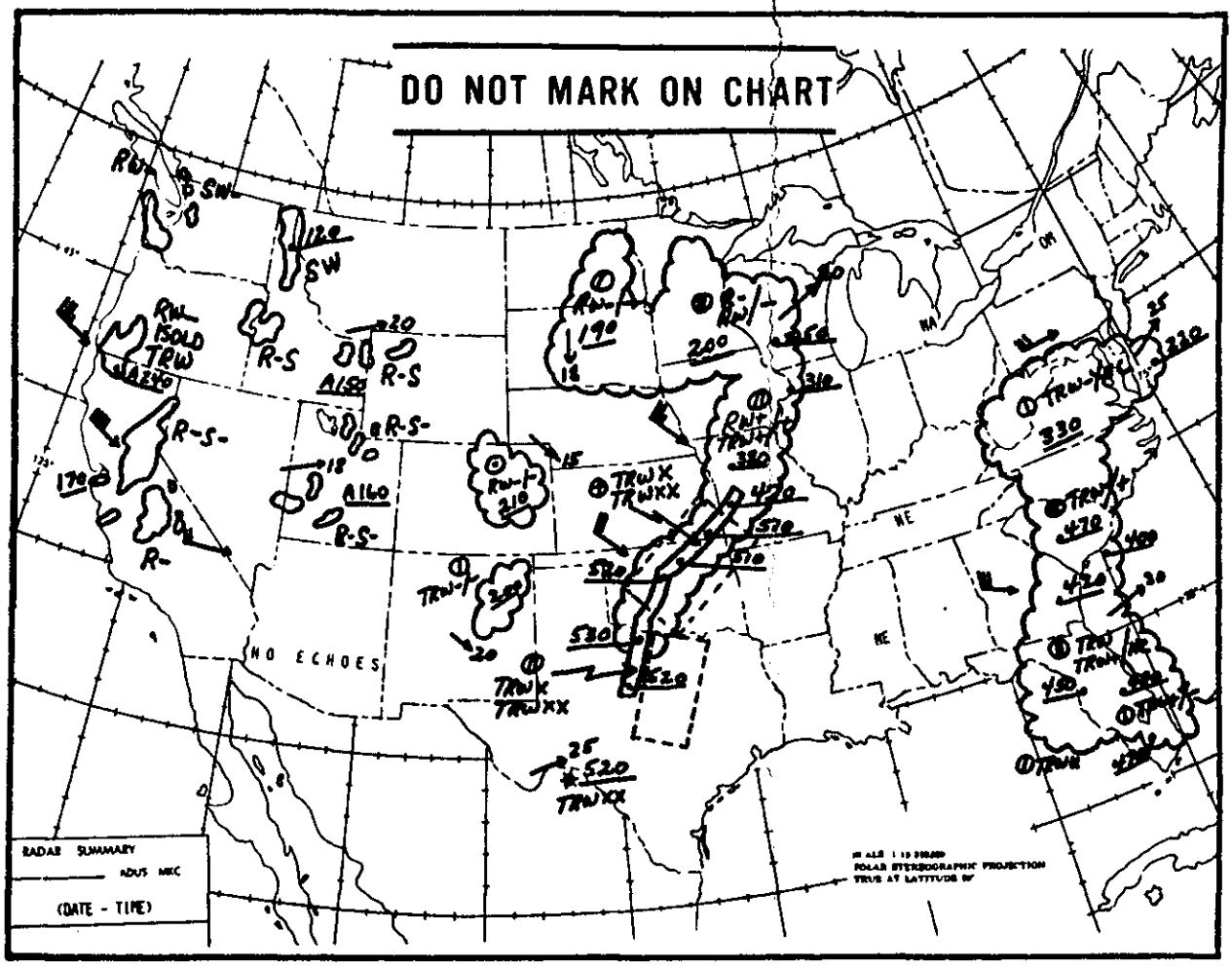
216. Which of the following symbols used on a Surface Analysis (weather map) represents a stationary front?

K01
1-
2-
3-
4-



217. On a Surface Weather Map (Surface Analysis), weak pressure gradients are sometimes depicted. How is this done?

K01
1- The pressure system is marked by alternating solid and dashed isobar lines at 4-millibar intervals.
2- The center of the pressure system is marked with an underlined three-digit code.
3- A large "W" is marked in the center of the pressure system.
4- Dashed isobar lines are placed at 2-millibar intervals.



218. Refer to the Radar Summary Chart above. What is the reported maximum echo tops at the Texas-Oklahoma border?

K07
1- 5,300 feet.
2- 15,200 feet.
3- 25,000 feet.
4- 53,000 feet.

219. Refer to the Radar Summary Chart above. What is the meaning of the solid boxed outline extending from northern Texas to central Missouri?

K07
1- A line of echoes has been noted within that area.
2- Scattered echoes exist within that area.
3- Light precipitation is occurring at that location.
4- Tops of the echoes are less than 15,300 feet at that location.

220. Refer to the Radar Summary Chart above. Which statement best describes the echoes reported in northeastern New Mexico?

K07
1- Echoes are increasing in intensity and maximum tops are less than 20,000 feet.
2- Visibility in the heavy rain showers is less than 1 mile.
3- Scattered cells are moving southeast at 20 knots.
4- Bases of the cells are at 2,000 feet.

221. What valuable bit of information, as of map time, is provided by a Radar Summary Chart?

K07
1- The observed winds aloft.
2- The location of major fronts.
3- The location of VFR and IFR weather.
4- The intensity and intensity trend of precipitation.

222. When using a constant-pressure chart for planning a flight at 10,000 feet MSL, to which of the following should the pilot refer?

K05
1- 850 mb chart.
2- 700 mb chart.
3- 500 mb chart.
4- 200 mb chart.

223. From which of the following can the observed temperature, temperature-dewpoint spread, and winds be determined at specified flight levels?

K05
1- Winds aloft forecasts.
2- Stability charts.
3- Constant pressure charts.
4- Significant weather prognostic charts.

224. A pilot who wishes to determine the observed temperature-dewpoint spread at FL 180 should refer to which of the following?

K05
1- Stability charts for 18,000 feet.
2- Winds and temperatures aloft forecast for 18,000 feet.
3- Significant weather prognostic chart.
4- Constant pressure analysis chart for 500 millibars.

225. Suppose the winds aloft forecast for Jackson, Mississippi, appeared as follows:

JAN 9900 9900+19 9900+09 9900+01

Which statement is true concerning the forecast wind?

K06
1- The wind direction is in reference to magnetic north.
2- The wind is expected to be light and variable.
3- The wind is expected to exceed 100 knots.
4- The wind is expected to be 99 knots from the north.

226. Which statement is true regarding Forecast Winds and Temperatures Aloft Charts?

K06
1- The temperatures showing neither + nor - should be considered + temperatures at all altitudes.
2- The windspeeds are given in miles per hour.
3- The temperatures are given in degrees Fahrenheit.
4- The wind directions are given in true directions.

227. Which facsimile chart locates and shows movement and intensities of thunderstorm areas?

K07
1- Radar Summary Chart.
2- Weather Depiction Chart.
3- Constant Pressure Chart.
4- Special Flight Forecast Chart.

228. For a brief summary of the location and movement of fronts, pressure systems, and circulation patterns, a pilot should refer to the

K08
1- Radar Summary Chart.
2- Terminal Forecast.
3- Area Forecast.
4- Stability Chart.

229. The probable freezing level and areas of icing conditions aloft can best be determined by referring to

K08
1- Terminal Forecasts.
2- Winds Aloft Forecasts.
3- Aviation Sequence Reports.
4- Area Forecasts.

230. Which statement is true regarding an Area Forecast?

K08
1- An Area Forecast covers an 18-hour period with an additional 12-hour categorical outlook.
2- An Area Forecast is valid for 12 hours with a 6-hour categorical outlook.
3- Area Forecasts give cloud heights in terms of AGL only.
4- Area Forecasts contain no information about icing or the freezing level.

231. Low level significant weather prognostic charts are used to assist the pilot in

K03
1- estimating the movement, development, and decay of weather patterns which might occur within the following 12 and 24 hour periods.
2- determining the position of fronts and pressure systems during the preceding 6 hours.
3- estimating the direction and speed of surface winds and the winds aloft for the following 6 hours.
4- determining the areas where ceilings are less than 1,000 feet and visibilities are less than 3 miles.

232. A low level significant weather prognostic chart provides which of the following?

K03
1- An interpretation of conditions existing in specific areas based on pilot reports.
2- An analysis of weather conditions as observed by weather radar.
3- The weather forecast to exist at a specific time in the future.
4- A representation of weather conditions existing at the time of the observation.

233. The source of information for determining the probability of turbulence aloft is the

K03
1- Area Forecasts.
2- Terminal Forecasts.
3- Aviation Weather Reports.
4- Significant Weather Prognostic Charts.

234. On the low level significant weather prognostic charts on page 53, the cold front extending from Utah southwestward through California is expected to move into central Colorado, New Mexico, and Arizona in approximately

K03
1- 48 hours.
2- 24 hours.
3- 12 hours.
4- 6 hours.

235. On the basis of the low level significant weather prognostic chart (VT 1200Z) on page 53, at what altitude is the freezing level expected to be in the states of Utah and Colorado?

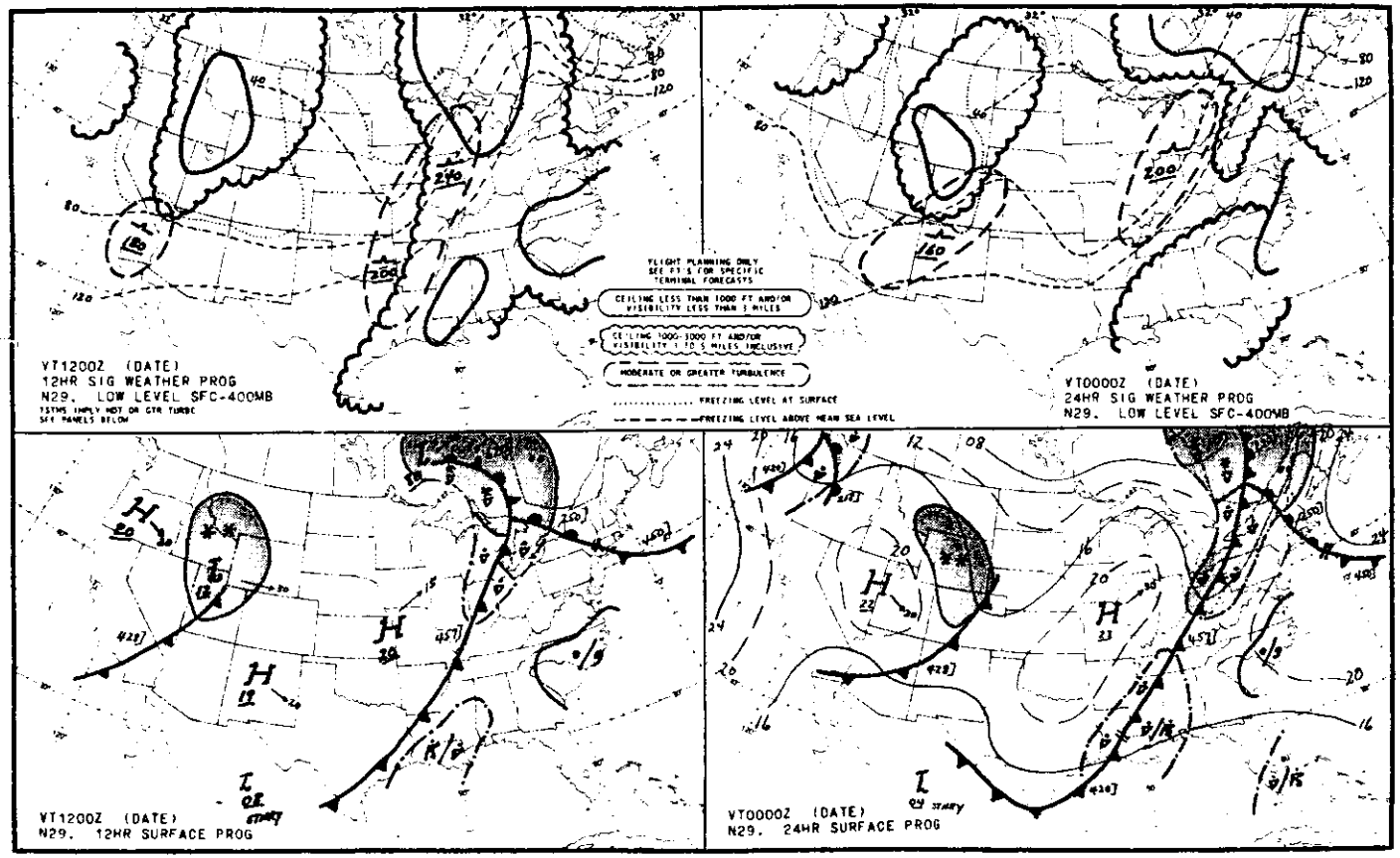
K03
1- At the surface.
2- 4,000 feet MSL.
3- 8,000 feet MSL.
4- 18,000 feet MSL.

236. According to the low level significant weather prognostic chart (VT 1200Z) on page 53, which of the following conditions can be expected between the surface and 24,000 feet in southern California?

K03
1- Moderate or greater turbulence from the surface to 18,000 feet and no ceiling less than 3,000 feet.
2- Severe turbulence at all levels up to 18,000 feet and a layer of broken clouds between 1,000 feet and 3,000 feet.
3- Severe turbulence above 18,000 feet and no clouds less than 3,000 feet.
4- Moderate turbulence above 18,000 feet and a ceiling between 1,000 and 3,000 feet.

237. On the basis of the low level significant weather prognostic chart (VT 1200Z) on page 53, which of the following accurately describes the forecast weather in northern Utah, southern Idaho, and western Wyoming?

K03
1- The ceiling is expected to be 1,000 to 3,000 feet AGL or visibility 3 to 5 miles, and the freezing level will be at 4,000 feet MSL.
2- The cloud base is expected to be 1,200 feet AGL and the visibility is 3 to 5 miles in occasional snow flurries.
3- The cloud base is expected to be 1,200 feet AGL with intermittent snow, and the freezing level is at 4,000 feet MSL.
4- The ceiling is expected to be less than 1,000 feet AGL or visibility less than 3 miles with continuous snow, and the freezing level will be at the surface.


VT1200Z (DATE)
12HR SIG WEATHER PROG
N29. LOW LEVEL SFC-400MB
VT0000Z (DATE)
24HR SIG WEATHER PROG
N29. LOW LEVEL SFC-400MB
FLIGHT PLANNING ONLY
SEE FT'S FOR SPECIFIC
TERMINAL FORECASTS
CEILING LESS THAN 1000 FT AND/OR
VISIBILITY LESS THAN 3 MILES
CEILING 1000-3000 FT AND/OR
VISIBILITY 3 TO 5 MILES INCLUSIVE
MODERATE OR GREATER TURBULENCE
FREEZING LEVEL AT SURFACE
FREEZING LEVEL ABOVE MEAN SEA LEVEL
VT1200Z (DATE)
N29. 12HR SURFACE PROG
VT0000Z (DATE)
N29. 24HR SURFACE PROG

238. Interpret the following radar weather report:

HDO 1132 AREA 2TRW++ 6R-/NC 67/130 308/45 105W CELLS 2240 MT 380 AT 66/54

Which statement is true concerning the report?

K09
1- The area of echoes is moving in a southwesterly direction.
2- The area of echoes contains two-tenths coverage of thunderstorms and very heavy rain showers.
3- The visibility is 2 miles in thunderstorms and 6 miles in light rain.
4- The area of echoes is 105 miles west of the station (HDO).

239. Interpret the following radar weather report:

JAN 1935 SPL LN 10TRWX/NC 86/40 164/60 199/115 12W CELLS 2430 MT 440 AT 159/65 D10

Which statement is true concerning the report?

K09
1- The movement of the area of echoes is from the northwest.
2- The line of echoes is located east through south and is 12 NM wide.
3- The cells are moving toward the southeast.
4- The maximum top of the cells is 24,300 feet.

240. Which of these situations would most likely result in freezing precipitation?

K11
1- Rain falling from air which has a temperature of 32° F. or less into air having a temperature of more than 32° F.
2- Rain falling from air which has a temperature of more than 32° F. into air having a temperature of 32° F. or less.
3- Rain falling from air which has a temperature of 0° C. or less into air having a temperature of 0° C. or less.
4- Rain which has a super-cooled temperature of 0° C. or less falling into air having a temperature of more than 0° C.

241. When an air mass is stable, which of the following conditions is most likely to exist?

K11
1- Smoke, dust, haze, etc., concentrated in lower levels with resulting poor visibility.
2- Towering cumulus and cumulonimbus clouds.
3- Moderate to severe turbulence in lower levels.
4- Dust, smoke, and haze at the higher levels with good visibility at the surface.

242. The conditions necessary for the formation of cumulonimbus clouds are a lifting action and

K11
1- stable or unstable air.
2- unstable, moist air.
3- unstable air containing excess condensation nuclei.
4- stable, moist air.

243. The conditions necessary for the formation of stratus clouds are a cooling action and

K11
1- unstable, moist air.
2- unstable air containing excess condensation nuclei.
3- stable, moist air.
4- stable or unstable air.

244. Whether clouds will be predominantly stratiform or cumuliform is determined by the

K11
1- temperature of the air being lifted.
2- source of lift.
3- percent of moisture content of the air.
4- degree of stability of the air being lifted.

245. When conditionally unstable air with a high moisture content and a very warm surface temperature is forecast, one can expect what type of weather?

K11
1- Continuous heavy precipitation.
2- Smooth, cloudless skies.
3- Fog and low stratus clouds.
4- Strong updrafts and cumulonimbus clouds.

246. In Area Forecasts, cloud heights are given in reference to

K08
1- pressure altitude.
2- density altitude.
3- sea level or ground level.
4- ground level only.

247. Select the true statement pertaining to Terminal Forecasts.

K09
1- Omission of a wind entry specifically implies a calm wind forecast.
2- A visibility forecast appears only if the visibility is expected to be 6 miles or less.
3- They include specific information concerning cloud tops, icing, and turbulence.
4- They do not include surface wind forecasts.

248. Select the true statement pertaining to Terminal Forecasts.

K09
1- A forecast of prevailing visibility appears only if it is expected to be 3 miles or less.
2- Terminal Forecasts do not include surface wind forecasts.
3- Terminal Forecasts include specific information concerning cloud tops, icing, and turbulence.
4- If the speed of the surface wind is forecast to be less than 10 knots, the entire wind group is omitted.

249. In regard to ceiling and/or visibility, what is the meaning of the term "MVFR" as used in the categorical outlook portion of Terminal and Area Forecasts?

K09
1- A ceiling of less than 1,000 feet, and/or visibility less than 1 mile.
2- A ceiling of 3,000 to 5,000 feet, and visibility of 5 to 7 miles.
3- A ceiling of less than 1,000 feet, and/or visibility less than 3 miles.
4- A ceiling of 1,000 to 3,000 feet, and/or visibility of 3 to 5 miles.

250. Terminal Forecasts are issued how many times a day and cover what period of time?

K09
1- Three times daily and are valid for 24 hours with a 6-hour categorical outlook.
2- Two times daily and are valid for 24 hours with an additional 4-hour categorical outlook.
3- Three times daily and are valid for 8 hours with an additional 4-hour categorical outlook.
4- Four times daily and are valid for 8 hours.

251. A visibility entry does not appear in a Terminal Forecast when the visibility is expected to

K09
1- be less than the minimum for IFR operations.
2- meet the minimum required for VFR operations.
3- be more than 6 miles.
4- be unlimited.

252. Interpret the following radar weather report:

LIT 1133 AREA 4TRW+/+ 22/100 88/170 196/180 220/115 CELLS 2425 MT 310 AT 162/110

Which statement is true concerning the report?

K09
1- The maximum top of the cells is located 162° and 110 NM from the station (LIT).
2- There are four cells with tops at 10,000 feet, 17,000 feet, and 11,500 feet.
3- The cells are moving in a direction of 162° at 10 knots.
4- The visibility is 4 miles in thunderstorms and the intensity of thunderstorms remains unchanged.

253. Consider the following aviation weather report:

OKC 1755 -X M7 OVC 1 1/2R+F 990/63/61/3205/ 980/RF2 RB12

Which of the following is true regarding OKC weather?

K12
1- The visibility varied from 11 miles to 2 miles.
2- Rain started 12 minutes before the report was issued.
3- The visibility was 11 1/2 miles with rain and fog.
4- At the time of the report rain had been occurring for 48 minutes.

254. Suppose the remarks section of the hourly aviation weather report contains the following coded information:

RADAT 87045

What is the meaning of this information?

K12
1- Radar echoes with tops at 45,000 feet were observed on the 087 radial of the VORTAC.
2- A pilot reported thunderstorms 87 DME miles distant on the 045 radial of the VORTAC.
3- Radar echoes were observed at a distance of 87 miles on a bearing of 045°.
4- Relative humidity was 87% and the freezing level (0° C.) was at 4,500 feet MSL.

255. Consider the following aviation weather report:

OKC 1755 -X M7 OVC 1 1/2R+F 990/63/61/3205/ 980/RF2 RB12

What does the item RF2 mean?

K12
1- The veritcal visibility is 200 feet with rain and fog.
2- The horizontal visibility is 2 miles with rain and fog.
3- Two-tenths of the sky is obscured by rain and fog.
4- The runway visual range is 2,000 feet.

256. SIGMET advisories refer to weather phenomena that are potentially hazardous to

K13
1- large, air carrier type aircraft only.
2- small, general aviation type aircraft only.
3- single-engine and light aircraft only.
4- all aircraft flying in the affected area.

257. Pilots should know that surface wind direction is given relative to

K14
1- magnetic north in written weather reports and forecasts.
2- true north when received in FSS Airport Advisories or control tower instructions for takeoffs and landings.
3- magnetic north, regardless of the means used to disseminate wind information.
4- true north in scheduled weather broadcasts for all stations except the broadcasting station.

258. Transcribed weather broadcasts (TWEB) can be monitored by tuning the appropriate radio communications receiver to certain

K15
1- FSS communications frequencies.
2- Airport advisory frequencies.
3- VOR and NDB frequencies.
4- NDB frequencies only.

259. If a strong temperature inversion is encountered immediately after takeoff or during an approach to a landing, a potential hazard exists because of turbulence created by

K15
1- cold air overriding calm, warm air.
2- strong convective currents.
3- strong surface winds.
4- wind shear.

260. Individual forecasts for specific routes of flight can be obtained from which of the following weather services?

K15
1- Transcribed weather Broadcasts (TWEB).
2- Terminal Forecasts.
3- Area Forecasts.
4- In-Flight Advisories.

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UA /OV GAG-OKC 1600 FL060 /TP BE18 /SK 060 SCT-BKN /RM LRG TSTM 85W OKC 20 WIDE
UA /OV AMA 270045 1745 FL035 /TP C172 /SK 045 OVC /RM VSBY 7-10
UA /OV MKC 270045 1800 FL030 /TP C150 /RM CELLS FRMG FAST WITH FLAT TOPS
UA /OV DDC 310020 1430 FL030 /TP BE18 /RM LGT HAIL
UA /OV CNU 360050 0830 FL090 /TP AC60 /RM FEW BLDUPS TOPS 50-70
UA /OV HLC 360030 1430 FL085 /TP C411 /RM LRG E-W TSTM 40 E-W 25 N-S
UA /OV OKC-PNC 1030 FL060 /TP C150 /TB SVR TURBC SHORT DURN BTWN LYRS
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261. During preflight preparation, weather reports and forecasts which are not routinely available at the local service outlet (FSS or WSO), can best be obtained by means of the

K12
1- Pilot's Automatic Telephone Answering Service (PATWAS).
2- Request/Reply Service.
3- Air Route Traffic Control Center (ARTCC).
4- Transcribed Weather Broadcasts (TWEB).

262. To best determine observed weather conditions between weather reporting stations, the pilot should refer to

K12
1- Weather Maps.
2- Pilot Reports.
3- Area Forecasts.
4- Prognostic Charts.

263. The Pilot Reports above indicate that a pilot reported which of the following?

K12
1- Clear icing 25 miles west of MKC.
2- Clear skies 85 miles west of OKC.
3- Severe turbulence between OKC and PNC.
4- Light hail 20 miles south and southeast of DDC.

264. According to the Pilot Reports above, a pilot reported that

K12
1- the top of the overcast at AMA was located at 4,500 feet MSL.
2- clear skies prevailed 85 miles west of OKC.
3- light hail occurred 20 miles northwest of DDC.
4- the tops of the clouds over CNU were located at 7,000 feet MSL.

265. According to the Pilot Reports above, a pilot reported that

K12
1- the base of stratus clouds is at 5,000 feet at CNU.
2- severe turbulence of short duration was encountered in a Cessna 150 between OKC and PNC.
3- several areas of turbulence were encountered 65 miles from OKC during climb to 15,000 feet.
4- the tops of cumulonimbus clouds are at 50,000 feet at CNU.

266. The Pilot Reports above indicate that a pilot reported which of the following?

K12
1- Light rain 20 miles northwest of DDC.
2- Clear icing 25 miles west of MKC.
3- A large thunderstorm 85 miles west of OKC.
4- Severe turbulence 65 miles north of PNC.

267. According to the Pilot Reports above, where was the lowest ceiling reported?

K12
1- 25 miles north and northwest of DDC.
2- 50 miles north of CNU.
3- 45 miles west of AMA.
4- Between GAG and OKC.

268. In an aviation weather report, which of the following symbols designate a ceiling when used in connection with a cloud height?

K12
1- M, E, W.
2- -OVC.
3- -BKN.
4- -X.

269. Which statement is true regarding actual air temperature and dewpoint temperature spread?

K20
1- The temperature spread decreases as the relative humidity decreases.
2- The temperature spread decreases as the relative humidity increases.
3- The temperature spread increases as the relative humidity increases.
4- Temperature and dewpoint spread are not related to relative humidity.

270. With respect to advection fog, which statement is true?

K21
1- It forms almost exclusively at night or near daybreak.
2- It forms when unstable air is cooled adiabatically.
3- It is slow to develop, and dissipates quite rapidly.
4- It can appear suddenly during day or night, and it is more persistent than radiation fog.

271. Radiation fog is most likely to occur with which of the following conditions?

K21
1- Warm, moist air being forced upslope by light winds resulting in the air being cooled and condensed.
2- Low temperature/dewpoint spread, calm wind conditions, the presence of hydroscopic nuclei, low overcast, and favorable topography.
3- High humidity during the early evening, cool cloudless night with light winds, and favorable topography.
4- Warm, moist air flowing over a cold surface with an 8 to 10 knot wind causing mixing and condensation.

272. Which of the following is the cause of advection fog?

K21
1- Saturation of cool air as the precipitation falling through it is evaporated.
2- Warm moist air moving over colder ground or water.
3- Moist stable air being cooled adiabatically as it moves up sloping terrain.
4- Terrestrial radiation cooling the ground which in turn cools the air in contact with it.

273. One condition necessary for the formation of FOG is

K21
1- high relative humidity.
2- calm air.
3- visible moisture.
4- relative low pressure.

274. Which of the following in-flight hazards is most commonly associated with WARM FRONTS?

K21
1- Precipitation-induced fog.
2- Ice fog.
3- Advection fog.
4- Radiation fog.

275. What causes radiation fog to form?

K21
1- Moist air being warmed by the ground over which it passes.
2- The ground cooling the adjacent air to the dewpoint temperature during conditions of calm air and clear sky.
3- The addition of moisture to a mass of cold air as it moves over a body of water.
4- Moist, unstable air being cooled as it is forced up a sloping land surface.

276. Consider the following air mass characteristics:

A. Smooth air (above the friction level) and poor visibility.
B. Turbulence up to about 10,000 feet and good visibility except in areas of precipitation.
C. Cumuliform clouds.
D. Stratiform clouds and fog.
E. Stable lapse rate.
F. Unstable lapse rate.

A warm moist air mass is frequently characterized by

K22
1- B, C, and E.
2- A, D, and F.
3- B, D, and E.
4- A, D, and E.

277. Which of the following is a characteristic of STABLE AIR?

K22
1- Showery-type precipitation.
2- Cumuliform clouds.
3- Excellent visibility.
4- Restricted visibility.

278. Suppose an airport has an elevation of 2,500 feet. Assuming a standard temperature/dewpoint lapse rate, if the temperature at this airport is 75° F. and the dewpoint is 52° F., the base of the clouds formed by a lifting process would be located at about

K18
1- 2,500 feet MSL.
2- 5,000 feet MSL.
3- 7,500 feet MSL.
4- 11,500 feet MSL.

279. Suppose an airport has an elevation of 1,500 feet. Assuming a standard temperature/dewpoint lapse rate, if the temperature at this airport is 70° F. and the dewpoint is 48° F., the base of the clouds formed by a lifting process would be located at about

K18
1- 1,000 feet MSL.
2- 5,000 feet MSL.
3- 6,500 feet MSL.
4- 12,500 feet MSL.

280. Suppose an airport has an elevation of 2,000 feet. Assuming a standard temperature/dewpoint lapse rate, if the temperature at this airport is 65° F. and the dewpoint is 54° F., the base of the clouds formed by a lifting process would be located at approximately

K18
1- 7,500 feet MSL.
2- 4,500 feet MSL.
3- 2,500 feet MSL.
4- 1,750 feet MSL.

281. Suppose an airport has a sea level elevation. Assuming a standard temperature/dewpoint lapse rate, if the temperature at this airport is 85° F. and the dewpoint is 56° F., the base of the clouds formed by a lifting process would be located at about

K18
1- 14,500 feet MSL.
2- 6,500 feet MSL.
3- 5,300 feet MSL.
4- 2,900 feet MSL.

282. Suppose an airport has a sea level elevation. Assuming a standard temperature/dewpoint lapse rate, if the temperature at this airport is 80° F. and the dewpoint is 62° F., the base of the clouds formed by a lifting process would be located at approximately

K18
1- 3,000 feet MSL.
2- 4,000 feet MSL.
3- 6,000 feet MSL.
4- 8,000 feet MSL.

283. Suppose an airport has an elevation of 1,000 feet. Assuming a standard temperature/dewpoint lapse rate, if the temperature at this airport is 70° F. and the dewpoint is 52° F., the base of the clouds formed by a lifting process would be located at approximately

K18
1- 4,000 feet MSL.
2- 5,000 feet MSL.
3- 6,000 feet MSL.
4- 8,000 feet MSL.

284. Suppose an airport has an elevation of 4,000 feet. Assuming a standard temperature/dewpoint lapse rate, if the temperature at this airport is 60° F. and the dewpoint is 42° F., the base of the clouds formed by a lifting process would be located at approximately

K18
1- 4,000 feet MSL.
2- 5,000 feet MSL.
3- 6,000 feet MSL.
4- 8,000 feet MSL.

285. Suppose an airport has an elevation of 2,000 feet. Assuming a standard temperature/dewpoint lapse rate, if the temperature at this airport is 70° F. and the dewpoint is 52° F., the base of the clouds formed by a lifting process would be located at approximately

K18
1- 8,000 feet MSL.
2- 6,000 feet MSL.
3- 4,000 feet MSL.
4- 3,000 feet MSL.

286. Which statement is true concerning the in-flight hazard of HAIL?

K19
1- Large hailstones are composed entirely of clear ice.
2- Tropical and subtropical thunderstorms contain more hail than thunderstorms in northern latitudes.
3- Hailstones may be thrown outward from a storm cloud for several miles.
4- Hail is usually produced by altocumulus clouds.

287. Which one of the following types of clouds would indicate areas of convective turbulence?

K19
1- Cirrus clouds.
2- Altocumulus standing lenticular clouds.
3- Nimbostratus clouds.
4- Towering cumulus clouds.

288. Select the true statement pertaining to the life cycle of a thunderstorm.

K24
1- The beginning of rain at the earth's surface indicates the mature stage of a thunderstorm.
2- The beginning of rain at the earth's surface indicates the dissipating stage of a thunderstorm.
3- Updrafts continue to develop throughout the dissipating stage of a thunderstorm.
4- The initial stage of a thunderstorm is always indicated by the development of a nimbus cloud.

289. Which of the following is considered to be the most hazardous condition associated with thunderstorms?

K24
1- Static electricity.
2- Lightning.
3- St. Elmo's Fire.
4- Wind shear and turbulence.

290. Which statement is true concerning SQUALL LINES?

K24
1- They offer the most intense weather hazard to aircraft.
2- They are associated with frontal systems only.
3- They are associated with cold fronts only.
4- They form slowly, but move rapidly.

291. The most severe weather conditions, such as destructive winds, heavy hail, and tornadoes, are generally associated with

K24
1- fast-moving warm fronts.
2- slow-moving cold fronts.
3- slow-moving warm fronts.
4- squall line thunderstorms.

292. What are the standard temperature and pressure values for sea level?

K26
1- 15° C. and 29.92 inches of mercury.
2- 59° C. and 1013.2 millibars.
3- 68° F. and 29.92 millibars.
4- 59° C. and 1013.2 inches of mercury.

293. At about what rate does temperature and dewpoint lapse rate converge in a convective current with unsaturated air?

K27
1- 5.4° F. per 1,000 feet.
2- 4.4° F. per 1,000 feet.
3- 3.0° F. per 1,000 feet.
4- 3.5° F. per 1,000 feet.

294. If the temperature at 1,000 feet MSL is +18° C. and a standard (average) temperature lapse rate exists, the freezing level will be located at approximately

K27
1- 7,000 feet MSL.
2- 8,500 feet MSL.
3- 9,500 feet MSL.
4- 10,000 feet MSL.

295. If the air temperature is +10° C. at an elevation of 2,000 feet MSL and a standard (average) temperature lapse rate exists, what will be the approximate freezing level?

K27
1- 7,000 feet MSL.
2- 9,000 feet MSL.
3- 11,000 feet MSL.
4- 14,000 feet MSL.

296. If the air temperature is +16° C. at an elevation of 3,000 feet MSL and a standard (average) temperature lapse rate exists, what will be the approximate freezing level?

K27
1- 7,000 feet MSL.
2- 9,000 feet MSL.
3- 11,000 feet MSL.
4- 14,000 feet MSL.

297. Suppose the air temperature is +18° C. at an elevation of 2,000 feet MSL and a standard (average) temperature lapse rate exists, what will be the approximate freezing level?

K27
1- 14,000 feet MSL.
2- 11,000 feet MSL.
3- 7,140 feet MSL.
4- 6,500 feet MSL.

298. If the air temperature is +12° C. at an elevation of 1,500 feet MSL and a standard (average) temperature lapse rate exists, what will be the approximate freezing level?

K27
1- 13,500 feet MSL.
2- 7,500 feet MSL.
3- 4,920 feet MSL.
4- 4,500 feet MSL.

299. A moist, cold air mass that is being warmed from below is characterized, in part, by

K22
1- continuous heavy precipitation.
2- smooth air.
3- fog and drizzle.
4- showers and thunderstorms.

300. Consider the following air mass characteristics:

A. Smooth air (above the friction level) and fair to poor visibility.
B. Turbulence up to about 10,000 feet and good visibility, except in areas of precipitation.
C. Cumuliform clouds.
D. Stratiform clouds.
E. Stable lapse rate.
F. Unstable lapse rate.

A moist air mass which is colder than the surface over which it passes, frequently has which of the above characteristics?

K22
1- A, D, and E.
2- B, D, and E.
3- B, C, and F.
4- A, D, and F.

301. Name a characteristic of an ADVANCING WARM FRONT that has moist, stable air.

K23
1- Smooth air; stratiform clouds.
2- Turbulent air; cumuliform clouds.
3- Fast movement; intermittent precipitation.
4- Fast movement; continuous precipitation.

302. Which statement is true regarding a cold front occlusion?

K23
1- The air ahead of the warm front is colder than the air behind the overtaking cold front.
2- The air ahead of the warm front is warmer than the air behind the overtaking cold front.
3- The air ahead of the warm front has the same temperature as the air behind the overtaking cold front.
4- The air between the warm front and cold front is colder than either the air ahead of the warm front or the air behind the overtaking cold front.

303. What type weather is generally associated with an advancing WARM FRONT that has moist, unstable air?

K23
1- Stratiform clouds, lightning, steady precipitation.
2- Cumuliform clouds, smooth air, steady precipitation.
3- Stratiform clouds, smooth air, steady precipitation.
4- Cumuliform clouds, turbulent air, and showery-type precipitation.

304. The factor which determines whether the type of cloudiness associated with a front will be predominantly stratiform or cumuliform is the

K23
1- degree of stability of the air being lifted.
2- relative humidity of the air behind the front.
3- dewpoint of the air being lifted.
4- pressure of the air behind the front.

305. Which statement is true regarding SQUALL LINES?

K24
1- They are nonfrontal and often contain severe steady-state thunderstorms.
2- They are slow in forming, but rapid in movement.
3- They are associated with cold fronts only.
4- They are associated with warm fronts only.

306. Which statement is true regarding the use of airborne weather-avoidance radar for the recognition of certain weather conditions?

K24
1- Areas of light rain, snow, and minute cloud droplets return significant echoes on the radarscope.
2- The avoidance of hail is assured when flying between and just clear of the most intense echoes.
3- The clear area between intense echoes indicates that visual sighting of storms can be maintained when flying between the echoes.
4- The radarscope provides no assurance of avoiding instrument weather conditions.

307. What causes variations in altimeter settings between weather reporting stations?

K28
1- Variation of terrain elevation creating barriers to the movement of an air mass.
2- Friction of the air with the earth's surface.
3- Coriolis force reacting with surface friction.
4- Unequal heating of the earth's surface.

308. In the Northern Hemisphere, which of the following is a true statement with regard to the flow of air within a low pressure center?

K28
1- Air flows outward, downward, and clockwise.
2- Air flows inward, downward, and counterclockwise.
3- Air flows outward, upward, and counterclockwise.
4- Air flows inward, upward, and counterclockwise.

309. Air tends to flow parallel to isobars rather than directly from high pressure areas to low pressure areas. What causes this?

K28
1- Pressure gradient force.
2- Corolis force.
3- Gravity.
4- Surface friction.

310. Which statement is true with regard to the general circulation of air associated with a high pressure area in the Northern Hemisphere?

K28
1- Air flows inward, downward, and counterclockwise.
2- Air flows outward, downward, and clockwise.
3- Air flows outward, upward, and counterclockwise.
4- Air flows inward, upward, and clockwise.

311. With respect to pressure systems, which of the following statements is true?

K28
1- Both high and low pressure areas are characterized by rising air.
2- A high pressure area or ridge is an area of rising air.
3- A low pressure area or trough is an area of descending air.
4- A low pressure area or trough is an area of rising air.

312. Which of the following statements is true with respect to either high or low pressure systems?

K28
1- Both high and low pressure areas are characterized by descending air.
2- A low pressure area or trough is an area of descending air.
3- A high pressure area or ridge is an area of rising air.
4- A high pressure area or ridge is an area of descending air.

313. What causes the counterclockwise flow of air around a low pressure in the Northern Hemisphere?

K28
1- Surface friction.
2- Coriolis force.
3- Pressure gradient.
4- Centrifugal force.

314. In the Northern Hemisphere, what causes the wind to be deflected to the right?

K28
1- The pressure gradient force.
2- Surface friction.
3- Centrifugal force.
4- Coriolis force.

315. If a strong temperature inversion is encountered on an approach to a landing, a potential hazard exists because of turbulence created by

K29
1- strong convective currents.
2- strong surface winds.
3- wind shear.
4- rapidly moving cold air overriding calm warm air.

316. Suppose the air temperature is +8° C. at an elevation of 1,350 feet MSL and a standard (average) temperature lapse rate exists, what will be the approximate freezing level?

K27
1- 3,350 feet MSL.
2- 5,350 feet MSL.
3- 9,350 feet MSL.
4- 10,285 feet MSL.

317. If the temperature at 500 feet MSL is +4° C. and a standard (average) temperature lapse rate exists, what will be the approximate freezing level?

K27
1- 1,640 feet MSL.
2- 2,500 feet MSL.
3- 3,500 feet MSL.
4- 4,500 feet MSL.

318. If the air temperature is +16° C. at an elevation of 1,000 feet MSL and a standard (average) temperature lapse rate exists, what will be the approximate freezing level?

K27
1- 7,000 feet MSL.
2- 9,000 feet MSL.
3- 11,000 feet MSL.
4- 14,000 feet MSL.

319. What prevents air from flowing directly from high pressure areas to low pressure areas?

K28
1- Surface friction.
2- Pressure gradient force.
3- Katabatic force.
4- Coriolis force.

320. To take advantage of favorable winds on an extended flight from west to east in the Northern Hemisphere, a pilot should plan the course so as to fly

K28
1- north of both low and high pressure areas.
2- north of low pressure areas and south of high pressure areas.
3- south of both low and high pressure areas.
4- south of low pressure areas and north of high pressure areas.

321. To take advantage of favorable winds on an extended flight from east to west in the Northern Hemisphere, a pilot should plan the course so as to fly

K28
1- north of low pressure areas and south of high pressure areas.
2- north of both low and high pressure areas.
3- south of low pressure areas and north of high pressure areas.
4- south of both low and high pressure areas.

322. What causes "WIND"?

K28
1- Coriolis force.
2- The earth's rotation.
3- Air mass modification.
4- Pressure differences.

323. In the Northern Hemisphere, the outward flow of air from a high pressure area or the inward flow to a low pressure area is deflected to the

K28
1- right in both a high and low pressure area.
2- right in a high pressure area; left in a low pressure area.
3- left in a high pressure area; right in a low pressure area.
4- left in both a high and low pressure area.

324. To maintain the desired ground track when flying directly toward a low pressure center (in the Northern Hemisphere), what heading correction, if any, would most likely be required?

K28
1- No correction is necessary, because Coriolis force will tend to keep the airplane on the desired track.
2- A correction to the right would be required.
3- No correction would be required.
4- A correction to the left would be required.

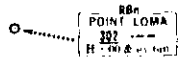
325. Which statement is true relating to the blue and magenta colors used to depict airports on Sectional Aeronautical Charts?

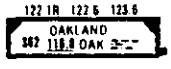
L01
1- Airports having air-to-ground communications are shown in blue; airports with no means of communication are shown in magenta.
2- Airports having runways capable of handling large aircraft are shown in blue; all others in magenta.
3- Airports having Airport Traffic Areas are shown in blue; all others in magenta.
4- Airports having concrete runways are shown in blue; all others in magenta.

326. To determine the horizontal limits and the base of control areas within the boundaries of the U.S.A., the pilot should refer to a

L01
1- World Aeronautical Chart.
2- Sectional Aeronautical Chart.
3- Low Altitude En Route Chart.
4- High Altitude En Route Chart.

327. Which of these aeronautical chart symbols indicates that the radio facility has DME capability?

L01
1- 

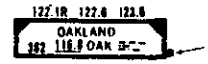
2- 
3- 
4- 

328. What is the meaning of this aeronautical chart symbol?

TTTTTTTTTT

L01
1- That a TCA is established at that airport.
2- That the airport has a control tower and an Airport Traffic Area.
3- That a Terminal Radar Service Area surrounds the airport.
4- That special VFR in fixed-wing aircraft is not permitted within the Control Zone.

329. What is the meaning of the small square in the corner of the radio facility data box shown here that appears on Sectional Aeronautical Charts?



L01
1- En Route Flight Advisory Service is available.
2- Voice transmissions are not available through that frequency.
3- Transcribed Weather Broadcasts are available.
4- All Standard FSS frequencies are available.

330. Which of the following statements is true in regard to the application of magnetic variation in solving navigation problems?

L04
1- To convert from true course to magnetic heading, add easterly variation to the true course.
2- To convert from true course to magnetic course, subtract easterly variation from the true course.
3- To convert from true course to magnetic course, subtract westerly variation from the true course.
4- To convert from magnetic course to magnetic heading subtract westerly variation from the magnetic course.

331. True course measurements on a Sectional Aeronautical Chart should be made at a meridian near the midpoint of the course because the

L04
1- lines of latitude vary from point to point.
2- isogonic lines are not parallel.
3- geographic North Pole from which direction is measured, is not located at the magnetic North Pole.
4- angles formed by converging lines of longitude vary from point to point.

332. Turbulence that causes jolts without appreciable changes in aircraft altitude or attitude should be reported as

K29
1- moderate chop.
2- severe.
3- very light chop.
4- light chop.

333. When unsecured objects are tossed about the cockpit or cabin due to turbulence, that turbulence should be reported as

K29
1- very light.
2- light.
3- moderate.
4- severe.

334. When turbulence causes changes in altitude and/or attitude but aircraft control remains positive, that turbulence should be reported as

K29
1- light.
2- very light.
3- severe.
4- moderate.

335. Turbulence that causes unsecured objects in the cockpit or cabin to become dislodged should be reported as

K29
1- very light.
2- light.
3- moderate.
4- severe.

336. Turbulence that causes a pilot to feel a slight strain against seatbelts should be reported as

K29
1- moderate chop.
2- moderate.
3- very light.
4- light.

337. Turbulence that causes a pilot to feel definite strains against the seatbelt or shoulder straps should be reported as

K29
1- light.
2- moderate.
3- severe.
4- very light.

338. If clouds form as a result of very stable moist air being forced to ascend a mountain slope, the clouds will be

K29
1- cirrus type with no vertical development or turbulence.
2- cumulonimbus with considerable vertical development and heavy rains.
3- cumulus type with considerable vertical development and turbulence.
4- stratus type with little vertical development and little or no turbulence.

339. Which statement is true regarding "standing mountain waves"?

K29
1- They are generally stationary over the mountain.
2- They are sometimes marked by stationary, lens-shaped clouds.
3- They are always indicated by the presence of a lenticular cloud formation.
4- They are found on the windward side of the mountain.

340. Suppose a strong temperature inversion exists near the surface. Should this phenomenon be considered hazardous to aircraft?

K29
1- Yes; a potential hazard exists due to turbulence created by wind shear.
2- Yes; a potential hazard exists due to strong, steady downdrafts.
3- No; temperature inversion near the surface creates smooth air and good visibilities.
4- No; a sudden change in outside air temperature would be the only evidence of a temperature inversion.

341. A Control Zone is shown on aeronautical sectional charts by which of these methods?

L01
1- A blue airport symbol.
2- A magenta colored band surrounding the airport.
3- The letters CT in the airport data box.
4- A blue dashed line encircling the airport.

342. How many statute miles are equal to 165 nautical miles?

L06
1- 143 SM.
2- 180 SM.
3- 189 SM.
4- 304 SM.

343. Two statute miles are equal to how many nautical miles?

L06
1- 1.50 NM.
2- 1.73 NM.
3- 2.30 NM.
4- 3.21 NM.

344. Two nautical miles are equal to how many statute miles?

L06
1- 1.5 SM.
2- 1.7 SM.
3- 2.3 SM.
4- 3.7 SM.

345. If the groundspeed is 215 knots, how far will the airplane travel in 3 minutes elapsed time?

L06
1- 1.28 NM.
2- 3.58 NM.
3- 6.45 NM.
4- 10.75 NM.

346. GIVEN:

Groundspeed . . . . . 155 knots
Elapsed time . . . . 2 minutes

L06 Determine distance traveled.

1- 2.58 NM.
2- 3.10 NM.
3- 5.16 NM.
4- 6.32 NM.

347. If the groundspeed is 168 knots, how far will the airplane travel in 1.5 minutes?

L06
1- 1.4 NM.
2- 1.68 NM.
3- 2.52 NM.
4- 4.2 NM.

348. If an airplane travels 7 nautical miles in 2.5 minutes, what is the groundspeed?

L06
1- 168 knots.
2- 175 knots.
3- 280 knots.
4- 290 knots.

349. If an airplane travels 5 nautical miles in 2 minutes elapsed time, what is its groundspeed?

L06
1- 90 knots.
2- 100 knots.
3- 150 knots.
4- 250 knots.

350. An airplane traveling 3.5 NM in 1.5 minutes has a groundspeed of

L06
1- 88 knots.
2- 121 knots.
3- 140 knots.
4- 233 knots.

351. When an airplane travels 3.5 nautical miles in 53 seconds, its groundspeed is

L06
1- 181 knots.
2- 126 knots.
3- 210 knots.
4- 238 knots.

352. Suppose an airplane has traveled 2 nautical miles in 56 seconds. What is the groundspeed?

L06
1- 114 knots.
2- 129 knots.
3- 187 knots.
4- 214 knots.

353. If an airplane travels 3 nautical miles in 47 seconds, what is the groundspeed?

L06
1- 94 knots.
2- 229 knots.
3- 235 knots.
4- 384 knots.

354. Consider the following:

Forecast wind . . . . . 265°/20 knots
Pressure altitude . . . . 8,000 feet
Ambient temperature . . . -15° C.
Indicated airspeed . . . 140 knots
Variation . . . . . 10° E.
True course . . . . . 175°

With these conditions, what would be the approximate magnetic heading and groundspeed?

L07
1- 165°/141 knots.
2- 165°/154 knots.
3- 173°/153 knots.
4- 183°/153 knots.

355. When determining the true course in an easterly or westerly direction on a Sectional Aeronautical Chart, the course measurement should be taken at a meridian near midpoint of the course because

L04
1- the angular measurement changes between points due to convergence of the lines of longitude.
2- the magnetic North Pole from which direction is measured, is not located at the geographic North Pole.
3- the isogonic lines are not parallel.
4- the lines of latitude are drawn in an arc.

356. If a given true course is held constant during a long-distance flight, the airplane will be following a

L04
1- rhumb line, and traveling a longer distance between two points than when following a great circle route.
2- great circle route, and traveling a longer distance between two points than when following a rhumb line.
3- great circle route, and traveling a shorter distance between two points than when following a rhumb line.
4- rhumb line, and traveling a shorter distance between two points than when following a great circle route.

357. Which of the following statements about longitude and latitude is true?

L04
1- Lines of longitude cross the equator at right angles.
2- Lines of latitude are drawn from the North Pole to the South Pole.
3- The 0° line of latitude passes through Greenwich, England.
4- Lines of longitude are parallel to the equator.

358. Which of the following statements about longitude and latitude is true?

L04
1- Lines of longitude are parallel to the equator.
2- A degree of latitude at any point on earth is equal to 60 nautical miles.
3- Lines of latitude pass through the North and South Poles.
4- Each line of longitude crosses the equator at a different angle.

359. Which statement is true with respect to lines of latitude?

L04
1- Latitude lines are used to establish time zones.
2- Latitude lines are used for measuring time and distance, but not for measuring direction.
3- Latitude lines are used for measuring angular distances east and west of Prime Meridian.
4- Latitude lines are parallel to the equator.

360. How many nautical miles are the equivalent of 420 statute miles?

L06
1- 330 NM.
2- 483 NM.
3- 350 NM.
4- 365 NM.

361. 150 statute miles is the equivalent of how many nautical miles?

L06
1- 172 NM.
2- 160 NM.
3- 145 NM.
4- 130 NM.

362. How many nautical miles are the equivalent of 127 statute miles?

L06
1- 110 NM.
2- 135 NM.
3- 146 NM.
4- 205 NM.

363. How many nautical miles are the equivalent of 193 statute miles?

L06
1- 310 NM.
2- 221 NM.
3- 205 NM.
4- 167 NM.

364. 360 nautical miles are the equivalent of how many statute miles?

L06
1- 313 SM.
2- 380 SM.
3- 414 SM.
4- 665 SM.

365. Consider the following:

True course . . . . . 238°
Variation . . . . . 3° W.
Indicated airspeed . . . 160 knots
Ambient temperature . . . -15° C.
Pressure altitude . . . . 8,500 feet
Forecast wind . . . . . 160°/25 knots

Under these conditions, the magnetic heading and groundspeed would be approximately

L07
1- 224°/171 knots.
2- 233°/171 knots.
3- 241°/178 knots.
4- 249°/171 knots.

366. Consider the following:

True course . . . . . 258°
Variation . . . . . 10° E.
Indicated airspeed . . . 142 knots
Ambient temperature . . . +05° C.
Pressure altitude . . . . 6,500 feet
Forecast wind . . . . . 350°/30 knots

Under these conditions, the magnetic heading and groundspeed would be approximately

L07
1- 236°/157 knots.
2- 270°/157 knots.
3- 260°/155 knots.
4- 248°/155 knots.

367. Consider the following:

True course . . . . . 330°
Variation . . . . . 15° E.
Indicated airspeed . . . 160 knots
Ambient temperature . . . -10° C.
Pressure altitude . . . . 4,500 feet
Forecast wind . . . . . 090°/25 knots

Under these conditions, the magnetic heading and groundspeed would be approximately

L07
1- 003°/166 knots.
2- 323°/177 knots.
3- 332°/166 knots.
4- 340°/177 knots.

368. GIVEN:

True course . . . . . 167°
Variation . . . . . 11° E.
Deviation . . . . . +4°
Indicated airspeed . . . 135 knots
Ambient temperature . . . +15° C.
Pressure altitude . . . . 3,500 feet
Forecast wind . . . . . 105°/30 knots

Under the given conditions the compass heading and groundspeed would be approximately

L07
1- 145°/127 knots.
2- 149°/127 knots.
3- 156°/144 knots.
4- 160°/144 knots.

369. On a cross-country flight, suppose point "X" is crossed at 1550 and the plan is to reach point "Y" at 1620. Use the following information to determine the indicated airspeed required to reach point "Y" on schedule.

Distance between "X" & "Y" . 70 NM
Forecast wind . . . . . 115°/25 knots
Pressure altitude . . . . . 8,000 feet
Ambient temperature . . . . -05° C.
True course . . . . . 088°

The required indicated airspeed would be approximately

L08
1- 140 knots.
2- 146 knots.
3- 162 knots.
4- 184 knots.

370. On a cross-country flight, suppose point "A" is crossed at 1115 and arrival at point "B" is planned for 1140. Use the following information to determine the indicated airspeed required to arrive at point "B" at the desired time.

Distance between "A" & "B" . 67 NM
Forecast wind . . . . . 260°/15 knots
Pressure altitude . . . . . 8,500 feet
Ambient temperature . . . . -10° C.
True course . . . . . 235°

The required indicated airspeed would be approximately

L08
1- 109 knots.
2- 128 knots.
3- 114 knots.
4- 156 knots.

371. On a cross-country flight, suppose point "X" is crossed at 0957 and arrival at point "Y" is planned for 1045. Use the following information to determine the indicated airspeed required to arrive at point "Y" at the desired time.

Distance between "X" & "Y" . 125 NM
True course . . . . . 237°
Pressure altitude . . . . . 4,500 feet
Ambient temperature . . . . -10° C.
Forecast wind . . . . . 110°/20 knots

The required indicated airspeed would be approximately

L08
1- 134 knots.
2- 139 knots.
3- 145 knots.
4- 150 knots.

372. Consider the following:

Forecast wind	275°/20 knots
Pressure altitude	11,000 feet
Ambient temperature	-10° C.
Indicated airspeed	150 knots
Variation	11° E.
True course	210°

With these conditions, what would be the approximate magnetic heading and groundspeed?

L07
1- 199°/176 knots.
2- 205°/166 knots.
3- 205°/176 knots.
4- 216°/166 knots.

373. Consider the following:

Forecast wind	295°/25 knots
Pressure altitude	9,000 feet
Ambient temperature	-15° C.
Indicated airspeed	155 knots
Variation	-8° E.
True course	155°

With these conditions, what would be the approximate magnetic heading and groundspeed?

L07
1- 147°/193 knots.
2- 152°/174 knots.
3- 152°/193 knots.
4- 160°/193 knots.

374. Consider the following:

Forecast wind	125°/20 knots
Pressure altitude	10,000 feet
Ambient temperature	-05° C.
Indicated airspeed	140 knots
Variation	12° E.
True course	095°

With these conditions, what would be the approximate magnetic heading and groundspeed?

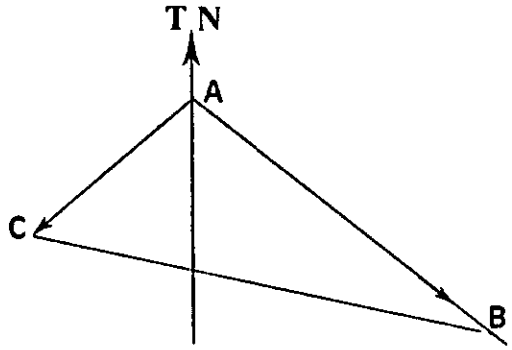
L07
1- 083°/163 knots.
2- 087°/145 knots.
3- 099°/145 knots.
4- 111°/163 knots.

375. Consider the following:

Forecast wind	185°/30 knots
Pressure altitude	9,000 feet
Ambient temperature	-10° C.
Indicated airspeed	150 knots
Variation	10° E.
True course	165°

With these conditions, what would be the approximate magnetic heading and groundspeed?

L07
1- 155°/170 knots.
2- 159°/142 knots.
3- 169°/142 knots.
4- 179°/170 knots.



376. If the illustration above is used to explain the wind triangle, it would be correct to state that

L07
1- line A-B represents true heading and true airspeed, and line C-B represents true course and groundspeed.
2- line A-B represents true course and true airspeed, and line C-B represents true heading and groundspeed.
3- line A-B represents true heading and groundspeed, and line C-B represents true course and true airspeed.
4- line A-B represents true course and groundspeed, and line C-B represents true heading and true airspeed.

377. Consider the following:

Forecast wind	205°/15 knots
Pressure altitude	7,000 feet
Ambient temperature	+10° C.
Indicated airspeed	135 knots
Variation	14° E.
True course	105°

With these conditions, what would be the approximate magnetic heading and groundspeed?

L07
1- 097°/155 knots.
2- 153°/153 knots.
3- 171°/153 knots.
4- 183°/155 knots.

378. Suppose on a cross-country flight, point "X" is crossed at 1015 and arrival at point "Y" is expected at 1025. Use the following information to determine the indicated airspeed required to reach point "Y" on schedule.

Distance between "X" & "Y" . 27 NM
True course . . . . . 100°
Pressure altitude . . . . . 5,500 feet
Ambient temperature . . . . +05° C.
Forecast wind . . . . . 240°/30 knots

The required indicated airspeed would be approximately

L08
1- 128 knots.
2- 140 knots.
3- 162 knots.
4- 171 knots.

379. Suppose on a cross-country flight, point "X" is crossed at 1545 and arrival at point "Y" is expected at 1623. Use the following information to determine the indicated airspeed required to reach point "Y" on schedule.

Distance between "X" & "Y" . 87 NM
True course . . . . . 265°
Pressure altitude . . . . . 8,500 feet
Ambient temperature . . . . -05° C.
Forecast wind . . . . . 350°/25 knots

The required indicated airspeed would be approximately

L08
1- 126 knots.
2- 138 knots.
3- 143 knots.
4- 162 knots.

380. Suppose on a cross-country flight, point "X" is crossed at 1500 and arrival at point "Y" is expected at 1547. Use the following information to determine the indicated airspeed required to reach point "Y" on schedule.

Distance between "X" & "Y" . 75 NM
Forecast wind . . . . . 150°/30 knots
Pressure altitude . . . . . 9,500 feet
Ambient temperature . . . . -10° C.
True course . . . . . 165°

The required indicated airspeed would be approximately

L08
1- 96 knots.
2- 110 knots.
3- 125 knots.
4- 143 knots.

381. On a cross-country flight, suppose point "X" is crossed at 1600 and it is planned to reach point "Y" at 1635. Use the following information to determine the indicated airspeed required to reach point "Y" on schedule.

Distance between "X" & "Y" . 55 NM
Forecast wind . . . . . 125°/25 knots
Pressure altitude . . . . . 7,500 feet
Ambient temperature . . . . -05° C.
True course . . . . . 105°

The required indicated airspeed would be approximately

L08
1- 94 knots.
2- 107 knots.
3- 118 knots.
4- 131 knots.

382. Suppose on a cross-country flight, point "X" is crossed at 1505 and arrival at point "Y" is expected at 1520. Use the following information to determine the indicated airspeed required to reach point "Y" on schedule.

Distance between "X" & "Y" . 65 NM
Forecast wind . . . . . 350°/25 knots
Pressure altitude . . . . . 18,000 feet
Ambient temperature . . . . -20° C.
True course . . . . . 175°

The required indicated airspeed would be approximately

L08
1- 178 knots.
2- 235 knots.
3- 260 knots.
4- 312 knots.

383. Consider the conditions listed below:

Departure path . . . . . straight out
Takeoff time 1435Z
Winds during climb . . . . . 175°/25 knots
T.C. during climb . . . . . 155°
Airport elevation . . . . . 2,000 feet
True airspeed . . . . . 130 knots
Rate of climb . . . . . 500 ft./min.

What would be the distance and time upon reaching 8,000 feet MSL?

L08
1- 21 NM and 1447Z.
2- 24 NM and 1452Z.
3- 27 NM and 1455Z.
4- 30 NM and 1500Z.

384. Consider the conditions listed below:

Airport elevation . . . 1,500 feet
Takeoff time 0425Z
Departure path . . . . straight out
T.C. during climb . . . 130°
Winds during climb . . 280°/30 knots
True airspeed . . . . . 140 knots
Rate of climb . . . . . 500 ft./min.

What would be the time and distance traveled upon reaching 9,000 feet MSL?

L08. 1- 1440Z and 30 NM.
2- 1444Z and 34 NM.
3- 1448Z and 38 NM.
4- 1452Z and 42 NM.

385. If a climb were made at a rate of 600 FPM to 7,500 feet MSL, what would be the distance and time flown from the departure airport under these conditions?

Departure path . . . . straight out
Takeoff time 1320Z
Airport elevation . . 2,100 feet
Wind during climb . . 150°/30 knots
T.C. during climb . . 140°
True airspeed . . . . 140 knots

The distance traveled and time upon reaching 7,500 feet MSL would be

L08 1- 4.9 NM/1329Z.
2- 10.9 NM/1325Z.
3- 16.6 NM/1329Z.
4- 23.6 NM/1333Z.

386. Suppose at an altitude of 7,500 feet MSL, the ambient temperature is +10° C. If the calibrated airspeed is 145 knots, the true airspeed would be approximately

L08 1- 127 knots.
2- 132 knots.
3- 160 knots.
4- 166 knots.

387. Suppose at an altitude of 6,000 feet MSL, the ambient temperature is +05° C. If the calibrated airspeed is 135 knots, the true airspeed would be approximately

L08 1- 123 knots.
2- 136 knots.
3- 140 knots.
4- 149 knots.

388. Suppose at an altitude of 7,000 feet MSL, the ambient temperature is +15° C. If the calibrated airspeed is 155 knots, the true airspeed would be approximately

L08 1- 136 knots.
2- 144 knots.
3- 167 knots.
4- 177 knots.

389. Suppose at an altitude of 18,000 feet MSL, the ambient temperature is -20° C. If the calibrated airspeed is 165 knots, the true airspeed would be approximately

L08 1- 116 knots.
2- 125 knots.
3- 218 knots.
4- 236 knots.

390. Suppose at an altitude of 13,500 feet MSL, the ambient temperature is -05° C. If the calibrated airspeed is 180 MPH, the true airspeed would be approximately

L08 1- 144 MPH.
2- 156 MPH.
3- 220 MPH.
4- 225 MPH.

391. Suppose when determining true airspeed, the altimeter indicates 8,500 feet. If the calibrated airspeed is 150 knots and the ambient temperature is +15° C., the true airspeed would be approximately

L08 1- 128 knots.
2- 135 knots.
3- 167 knots.
4- 176 knots.

392. GIVEN:

Indicated altitude . . . 8,000 ft. MSL
Ambient Temperature . . +16° C.

The true altitude is approximately

L08 1- 6,900 feet MSL.
2- 7,600 feet MSL.
3- 8,500 feet MSL.
4- 9,300 feet MSL.

393. GIVEN:

Ambient temperature . . +10° C.
Indicated altitude . . 14,000 ft. MSL

Determine approximate true altitude.

L08 1- 12,900 feet MSL.
2- 13,850 feet MSL.
3- 14,150 feet MSL.
4- 15,200 feet MSL.

394. Refer to the flight log on page 73.

GIVEN:
Usable fuel at departure . . 45 gals.
Fuel consumption rate . . . 13.8 GPH
Constant groundspeed throughout flight

Based on the takeoff time and actual times of arrival (ATA) at points up to HYM, what is the remaining distance, estimated time enroute, and fuel consumption from HYM to INK?

LO8
1- 55 NM; 25 minutes; 5.7 gals.
2- 55 NM; 27 minutes; 6.2 gals.
3- 110 NM; 50 minutes; 11.5 gals.
4- 127 NM; 55 minutes; 12.6 gals.

395. Refer to the flight log on page 73.

GIVEN:
Usable fuel at departure . . 44 gals.
Fuel consumption rate . . . 12.5 GPH
Constant groundspeed throughout flight

Based on time of takeoff and actual times of arrival (ATA) at points up to HYM, what will be the total time enroute from AUS to INK, and will there be sufficient fuel?

LO8
1- 2 hours 32 minutes; fuel load is sufficient.
2- 2 hours 46 minutes; fuel load is sufficient.
3- 2 hours 56 minutes; fuel load is sufficient.
4- 3 hours 30 minutes; fuel load is insufficient.

396. Refer to the flight log on page 73.

GIVEN:
Usable fuel at departure . . 42 gals.
Fuel consumption rate . . . 13.7 GPH
Constant groundspeed throughout flight

Based on time of takeoff and actual times of arrival (ATA) at points up to HYM, what will be the time enroute from HYM to INK, and how much usable fuel, including a 30 minute reserve, is needed for that portion of the flight?

LO8
1- 27 minutes; 13.1 gals.
2- 54 minutes; 12.6 gals.
3- 55 minutes; 19.4 gals.
4- 1 hour 23 minutes; 25.8 gals.

397. Refer to the flight log on page 73.

GIVEN:
Usable fuel at departure . . 40 gals.
Fuel consumption rate . . . 11.8 GPH
Constant groundspeed throughout flight

Based on the takeoff time and actual times of arrival (ATA) at points up to HYM, what is the new ETA at INK and how much usable fuel would remain upon arrival?

LO8
1- 1517, with 9.5 gals. remaining.
2- 1531, with 7.5 gals. remaining.
3- 1545, with 3.5 gals. remaining.
4- 1607, with zero fuel remaining.

398. Refer to the flight log on page 73.

GIVEN:
Usable fuel at departure . . 48 gals.
Fuel consumption rate . . . 14.2 GPH
Constant groundspeed throughout flight

Based on time of takeoff and actual times of arrival (ATA) at points up to HYM, how much fuel is required to fly from HYM to INK, and how much usable fuel would remain upon reaching INK?

LO8
1- 13 gals. required; 8 gals. remain.
2- 13 gals. required; 29 gals. remain.
3- 27 gals. required; 8 gals. remain.
4- 27 gals. required; 13 gals. remain.

399. Refer to the flight log on page 73.

GIVEN:
Usable fuel at departure . . 43 gals.
Fuel consumption rate . . . 12.2 GPH
Constant groundspeed throughout flight

Based on time of takeoff and actual times of arrival (ATA) at points up to HYM, how much usable fuel remains at HYM--and how much is needed to fly from HYM to INK?

LO8
1- 20.5 gals. remain; 11.2 gals. needed.
2- 22.5 gals. remain; 10.2 gals. needed.
3- 24.5 gals. remain; 8.2 gals. needed.
4- 24.5 gals. remain; 9.2 gals. needed.

400. Refer to the flight log on page 73.

GIVEN:
Usable fuel at departure . . 46 gals.
Fuel consumption rate . . . 13.5 GPH
Constant groundspeed throughout flight

Based on time of takeoff and actual times of arrival (ATA) at points up to HYM, what will be the time of arrival at INK--and how much reserve fuel will remain?

LO8
1- 1531 with 38 minutes reserve fuel.
2- 1533 with 33 minutes reserve fuel.
3- 1540 with 27 minutes reserve fuel.
4- 1545 with 25 minutes reserve fuel.

Form Approved: OMB No. 04-R0072

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

FLIGHT PLAN

CIVIL AIRCRAFT PILOTS. FAR Part 91 requires you file an IFR flight plan to operate under instrument flight rules in controlled airspace. Failure to file could result in a civil penalty not to exceed $1,000 for each violation (Section 901 of the Federal Aviation Act of 1958, as amended). Filing of a VFR flight plan is recommended as a good operating practice. See also Part 99 for requirements concerning DVFR flight plans.

1. TYPE	2. AIRCRAFT IDENTIFICATION	3. AIRCRAFT TYPE/ SPECIAL EQUIPMENT	4. TRUE AIRSPEED	5. DEPARTURE POINT	6. DEPARTURE TIME		7. CRUISING ALTITUDE
					PROPOSED (Z)	ACTUAL (Z)	
✓ VFR IFR DVFR	N123RO	D-215/A	145 KTS	AUS	1845Z	*	6,500

8. ROUTE OF FLIGHT

AUS V306 JCT V68 SJT V76 HYM V94 INK

9. DESTINATION (Name of airport and city)	10. EST. TIME ENROUTE		11. REMARKS
	HOURS	MINUTES	
INK	2	32	—

12. FUEL ON BOARD		13. ALTERNATE AIRPORT(S)	14. [illegible]	15. NUMBER ABOARD
HOURS	MINUTES			
3	55			4

16. COLOR OF AIRCRAFT
BLUE/WHITE

'IVAL

FAA Form 7233-1 (5-77)

FLIGHT LOG TAS - 145 KTS

DEPARTURE POINT ROBT MUELLER / CHECK POINT	VOR IDENT. FREQ.	RADIAL TO / FROM	DISTANCE LEG / REMAINING	TIME POINT-POINT / CUMULATIVE	TIME TAKEOFF / ETA / ATA	GROUND SPEED	
			—	—	1245		
AUS	114.6	270	335	:50	1335	*	
		269	111				
JCT	116.0	315	224	:50	1340	*	
		315	57	:26	1404		
SJT	115.1	313	167	1:16	1408	*	
		313	57	:26	1434		
HYM	110.4	252	110	1:42	1436	*	
		250	55	:25	1501		
MAF	114.8	251	55	2:07	1529	*	
		250	55	:25	*	*	
DESTINATION INK	112.1		TOTAL 0	2:32			

DATE

PREFLIGHT CHECK LIST

EN ROUTE WEATHER/WEATHER ADVISORIES

INTENTIONALLY LEFT BLANK

DESTINATION WEATHER
INK - CLR 15 65/50 2710

ALTERNATE WEATHER
N/A

WINDS ALOFT
30 - 240/10
60 - 250/15
90 - 260/20

FORECASTS
NO SIGNIFICANT CHANGES

NOTAMS/AIRSPACE RESTRICTIONS
NO PERTINENT NOTAMS

U.S. GPO: 1977—728-857

401. Assume a pilot plans to descend from 10,000 feet MSL so as to arrive at 5,500 feet MSL 5 NM from BACKEAST VORTAC. With a groundspeed of 155 knots and a descent of 500 FPM, at what distance from the VORTAC should the descent be started?

L09
1- 9 NM.
2- 14 NM.
3- 23 NM.
4- 28 NM.

402. Assume it is planned to descend from 9,000 feet MSL so as to arrive at 4,500 feet MSL 5 SM from OUTWEST VORTAC. With a groundspeed of 168 MPH and a descent of 600 FPM, at what distance from the VORTAC should the descent be started?

L09
1- 12.5 SM.
2- 21 SM.
3- 26 SM.
4- 30 SM.

403. Suppose you plan to descend from 7,500 feet MSL so as to arrive at 1,500 feet MSL 7 statute miles from your destination. With a groundspeed of 160 MPH you plan to descend at 500 FPM. At what distance from the destination should you begin the descent?

L09
1- 12 SM.
2- 25 SM.
3- 32 SM.
4- 39 SM.

404. Consider this information:

Altitude to lose . . . . 6,000 feet
Rate of descent . . . . 600 FPM
Groundspeed . . . . . 162 knots

To arrive at the desired altitude 5 NM from destination, the descent should begin at what distance?

L09
1- 10 NM.
2- 22 NM.
3- 27 NM.
4- 32 NM.

405. Suppose a descent of 7,500 feet is planned so as to arrive at the desired altitude 5 NM from the destination. If the groundspeed is 144 knots and a descent of 600 FPM is planned, the descent should begin at what distance?

L09
1- 35 NM.
2- 30 NM.
3- 25 NM.
4- 12.5 NM.

406. Consider this information:

Altitude to lose . . . . 5,500 feet
Rate of descent . . . . 500 FPM
Groundspeed . . . . . 147 knots

To arrive at the desired altitude 8 NM from destination, the descent should begin at what distance?

L09
1- 35 NM.
2- 27 NM.
3- 19 NM.
4- 11 NM.

407. Assume that a TRUE HEADING of 190° has a resultant ground track of 210° and a TRUE AIRSPEED of 170 MPH has a resultant groundspeed of 160 MPH. From this information, the wind would be determined to be from

L10
1- 100° at 45 MPH.
2- 120° at 58 MPH.
3- 278° at 60 MPH.
4- 305° at 50 MPH.

408. Assume a true heading of 230° results in a ground track of 250°. With a true airspeed of 160 knots and a groundspeed of 175 knots, the wind would be from

L10
1- 135°/59 MPH.
2- 165°/60 MPH.
3- 270°/37 MPH.
4- 343°/60 MPH.

409. Assume a true heading of 350° results in a ground track of 335°. With a true airspeed of 140 knots and a groundspeed of 115 knots, the wind would be from

L10
1- 015°/30 knots.
2- 035°/40 knots.
3- 215°/40 knots.
4- 290°/40 knots.

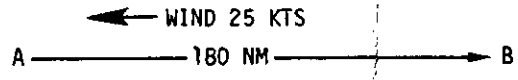
410. GIVEN:

Indicated altitude . . . 9,000 ft. MSL
Ambient temperature . . +30° C.

True altitude is approximately

L08
1- 7,900 feet MSL.
2- 8,050 feet MSL.
3- 10,000 feet MSL.
4- 10,250 feet MSL.

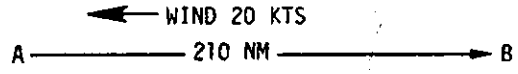
411.



Suppose a nonstop round trip flight is being made between "A" and "B." If the true airspeed is 95 knots, what is the total time for the flight?

L08
1- 1 hour 54 minutes.
2- 3 hours 48 minutes.
3- 4 hours 4 minutes.
4- 5 hours 8 minutes.

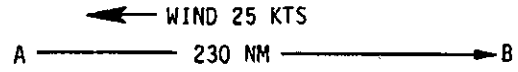
412.



Suppose a nonstop round trip flight is being made between "A" and "B." If the true airspeed is 105 knots, what is the average groundspeed for the entire flight?

L08
1- 85 knots.
2- 101 knots.
3- 105 knots.
4- 125 knots.

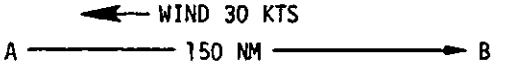
413.



Suppose a nonstop round trip flight is being made between "A" and "B." If the true airspeed is 125 knots and rate of fuel consumption is 13.5 GPH, how much fuel is required for the flight?

L08
1- 48.0 gals.
2- 51.8 gals.
3- 57.8 gals.
4- 77.9 gals.

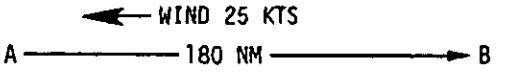
414.



Suppose a nonstop round trip flight is being made between "A" and "B." If the true airspeed is 110 knots and rate of fuel consumption is 11.8 GPH, how much fuel is required for the flight?

L08
1- 27.0 gals.
2- 34.8 gals.
3- 39.3 gals.
4- 43.8 gals.

415.



Suppose a nonstop round trip flight is being made between "A" and "B." If the true airspeed is 145 knots, what is the total time for the flight?

L08
1- 2 hours 6 minutes.
2- 2 hours 25 minutes.
3- 2 hours 33 minutes.
4- 3 hours.

416. Assume a pilot plans to begin descending from 8,000 feet MSL when 20 statute miles from HOMEPLATE VORTAC. If the groundspeed is 180 MPH and the pilot wants to arrive over the VORTAC at 5,500 feet MSL, the rate of descent should be

L09
1- 250 FPM.
2- 378 FPM.
3- 416 FPM.
4- 875 FPM.

417. Assume a pilot plans to begin a descent from 8,500 feet MSL when 15 NM from the destination airport. If the groundspeed is 150 knots and it is desired to arrive at 4,500 feet MSL when over the airport, the rate of descent should be

L09
1- 444 FPM.
2- 550 FPM.
3- 666 FPM.
4- 1,600 FPM.

418. Suppose after 155 miles are flown from the departure point, the airplane's position is located 15 miles off course. If 70 miles remain to be flown, what approximate <u>total</u> correction should be made to converge on the destination?

L11
1- 5°.
2- 12°.
3- 18°.
4- 34°.

419. Suppose after 155 miles are flown from the departure point, the airplane's position is located 10 miles off course. If 80 miles remain to be flown, what approximate <u>total</u> correction should be made to converge on the destination?

L11
1- 4°.
2- 7°.
3- 11°.
4- 14°.

420. Suppose after 150 miles are flown from the departure point, the airplane's position is located 8 miles off course. If 160 miles remain to be flown, what approximate <u>total</u> correction should be made to converge on the destination?

L11
1- 3°.
2- 6°.
3- 9°.
4- 12°.

421. Which of the following situations would result in "reverse sensing" of a VOR receiver?

M06
1- Failing to change the OBS from the selected inbound course to the outbound course after passing the station.
2- Flying a heading that is reciprocal to the bearing selected on the OBS.
3- Setting the OBS to a bearing that is 90° from the bearing on which the aircraft is located.
4- Flying a heading that is 90° to the selected bearing on the OBS.

422. While maintaining a magnetic heading of 180° and a true airspeed of 130 knots, the 270 radial of a VOR is crossed at 1137 and the 260 radial at 1144. The approximate time and distance to this station are

M07
1- 38 minutes and 82 nautical miles.
2- 42 minutes and 91 nautical miles.
3- 45 minutes and 104 nautical miles.
4- 46 minutes and 96 nautical miles.

423. While maintaining a heading of 090° and a true airspeed of 140 knots, the 180 radial of a VOR is crossed at 1320 and the 170 radial is crossed at 1322. What are the approximate time and distance to this station?

M07
1- 6 minutes and 10 nautical miles.
2- 9 minutes and 12 nautical miles.
3- 10 minutes and 41 nautical miles.
4- 12 minutes and 28 nautical miles.

424. While maintaining a magnetic heading of 180° and a true airspeed of 140 knots, the 270 radial of a VOR is crossed at 1137 and the 260 radial at 1141. The approximate time and distance to this station are

M07
1- 44 minutes and 96 nautical miles.
2- 42 minutes and 91 nautical miles.
3- 38 minutes and 82 nautical miles.
4- 24 minutes and 56 nautical miles.

425. While maintaining a magnetic heading of 270° and a true airspeed of 130 knots, the 360 radial of a VOR is crossed at 1237 and the 350 radial at 1243. The approximate time and distance to this station are

M07
1- 36 minutes and 78 nautical miles.
2- 42 minutes and 91 nautical miles.
3- 44 minutes and 96 nautical miles.
4- 42 minutes and 104 nautical miles.

426. While maintaining a magnetic heading of 060° and a true airspeed of 130 knots, the 150 radial of a VOR is crossed at 1137 and the 140 radial at 1145. The approximate time and distance to this station are

M07
1- 38 minutes and 82 nautical miles.
2- 42 minutes and 91 nautical miles.
3- 40 minutes and 96 nautical miles.
4- 48 minutes and 104 nautical miles.

427. While maintaining a magnetic heading of 180° and a true airspeed of 130 knots, the 270 radial of a VOR is crossed at 1037 and the 260 radial at 1042. The approximate time and distance to this station are

M07
1- 30 minutes and 65 nautical miles.
2- 42 minutes and 91 nautical miles.
3- 44 minutes and 96 nautical miles.
4- 42 minutes and 104 nautical miles.

428. Suppose a true heading of 125° results in a ground track of 115°. With a true airspeed of 160 MPH and a groundspeed of 135 MPH, the wind is from

L10
1- 065°/36 MPH.
2- 145°/29 MPH.
3- 164°/37 MPH.
4- 175°/36 MPH.

429. If a true heading of 135° results in a ground track of 130° and a true airspeed of 135 knots results in a groundspeed of 140 knots, the wind should be from

L10
1- 019°/12 knots.
2- 066°/14 knots.
3- 200°/13 knots.
4- 246°/13 knots.

430. GIVEN:

True heading . . . . . 015°
Ground track . . . . . 360°
True airspeed . . . . . 138 knots
Groundspeed . . . . . 151 knots

DETERMINE: Windspeed and direction.

L10
1- 080°/47 knots.
2- 114°/40 knots.
3- 260°/40 knots.
4- 294°/40 knots.

431. GIVEN:

True heading . . . . . 130°
Ground track . . . . . 115°
True airspeed . . . . . 125 MPH
Groundspeed . . . . . 134 MPH

DETERMINE: Wind direction and speed.

L10
1- 018°/30 MPH.
2- 048°/35 MPH.
3- 145°/30 MPH.
4- 226°/34 MPH.

432. GIVEN:

True heading . . . . . 348°
Ground track . . . . . 357°
True airspeed . . . . . 165 knots
Groundspeed . . . . . 148 knots

DETERMINE: Wind direction and speed.

L10
1- 048°/30 knots.
2- 118°/28 knots.
3- 225°/30 knots.
4- 297°/30 knots.

433. Suppose after 90 miles are flown from the departure point, the airplane's position is located 10 miles off course. If 90 miles remain to be flown, what approximate total correction should be made to converge on the destination?

L11
1- 5°.
2- 10°.
3- 13°.
4- 18°.

434. Suppose after 75 miles are flown from the departure point, the airplane's position is located 20 miles off course. If 90 miles remain to be flown, what approximate total correction should be made to converge on the destination?

L11
1- 13°.
2- 16°.
3- 29°.
4- 49°.

435. Suppose after 240 miles are flown from the departure point, the airplane's position is located 25 miles off course. If 100 miles remain to be flown, what approximate total correction should be made to converge on the destination?

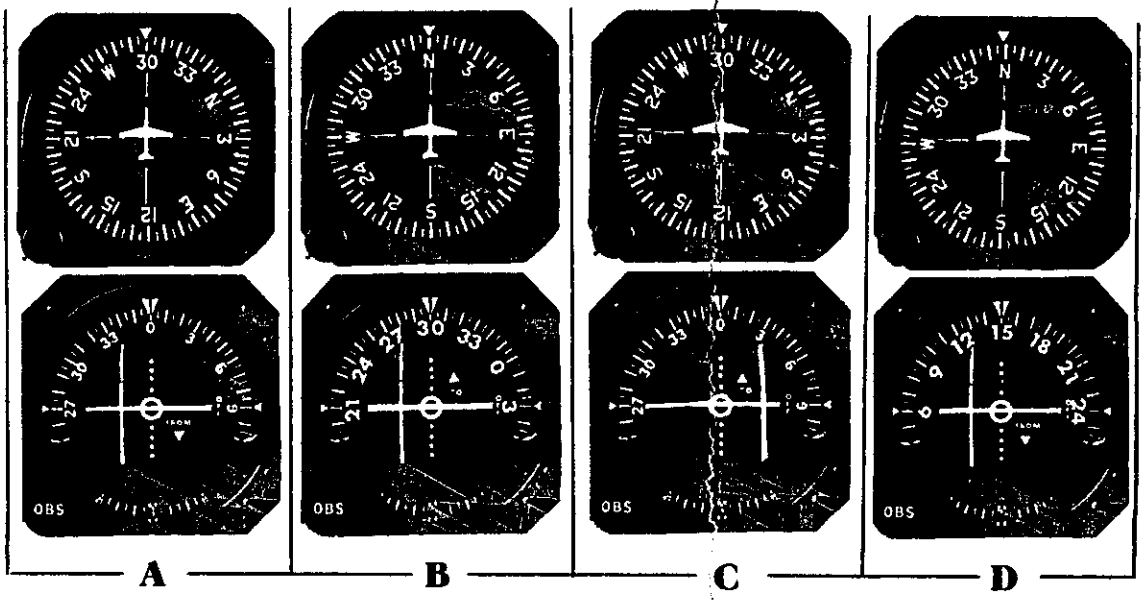
L11
1- 6°.
2- 15°.
3- 21°.
4- 30°.

436. Suppose after 141 miles are flown from the departure point, the airplane's position is located 11 miles off course. If 71 miles remain to be flown, what approximate total correction should be made to converge on the destination?

L11
1- 4°.
2- 9°.
3- 11°.
4- 14°.

437. Suppose after 165 miles are flown from the departure point, the airplane's position is located 20 miles off course. If 80 miles remain to be flown, what approximate total correction should be made to converge on the destination?

L11
1- 7°.
2- 15°.
3- 22°.
4- 29°.



438. Refer to the illustration above. If an airplane had the indications shown in instrument group C, then makes a 180° turn to the left and continues straight ahead, it will intercept which of these radials?

M 04
1- 090 radial.
2- 180 radial.
3- 270 radial.
4- 360 radial.

439. Refer to the illustration above. Which group of instruments shows the airplane in a position where a 180° turn would result in the airplane intercepting the 120 radial?

M04
1- A.
2- B.
3- C.
4- D.

440. Refer to the illustration above. Which group of instruments shows the airplane in a position where a straight course after a 180° turn would result in intercepting the 180 radial?

M04
1- A.
2- B.
3- C.
4- D.

441. Refer to the illustration above. Which groups of instruments show that the airplane is getting farther from the selected radial?

M04
1- B and C only.
2- B and D only.
3- A, C, and D.
4- A, B, and D.

442. Refer to the illustration above. In which groups of instruments would you expect the CDI to move closer to the center if the heading were maintained?

M04
1- C and D.
2- B and C.
3- A and D.
4- D and B.

443. Refer to the illustration above. Which group of instruments shows the airplane to be northeast of the VORTAC?

M04
1- A.
2- B.
3- C.
4- D.

444. Refer to the illustration above. Which group of instruments shows the airplane to be south-southeast of the VORTAC?

M04
1- A.
2- B.
3- C.
4- D.

445. When checking the accuracy of the airplane's VOR equipment by use of a VOT, the CDI should be centered and the omnibearing should indicate

M09
1- that the airplane is on the 360 radial.
2- the magnetic bearing from the VOT.
3- the magnetic bearing to the VOT.
4- that the airplane is on the 180 radial.

446. When checking the accuracy of the airplane's VOR equipment by use of a VOT, the CDI should be centered and the omnibearing should indicate which of the following ?

M09
1- 180° FROM or 0° TO.
2- 090° TO or 270° FROM.
3- 270° TO or 090° FROM.
4- 0° FROM or 180° TO.

447. When checking the course sensitivity of a VOR receiver, how many degrees should the OBS be rotated to move the CDI from the center to the last dot on either side?

M09
1- 5° - 10°.
2- 10° - 12°.
3- 15° - 18°.
4- 18° - 20°.

448. In most VOR receivers, the course deviation indicator is so calibrated that a full-scale deflection is registered when the aircraft's position is on a bearing that is

M09
1- 1° from the selected course when near the station and 10° from the selected course at a more distant location.
2- 10 NM or more to the left or right of the selected course.
3- 5° or more from the selected bearing.
4- 10° or more from the selected bearing.

449. Suppose the ADF is tuned to a nondirectional radiobeacon and the relative bearing changes from 090° to 100° in 1.5 minutes' elapsed time. The time en route to that station would be approximately

M13
1- 6 minutes.
2- 9 minutes.
3- 12 minutes.
4- 15 minutes.

450. Suppose the ADF is tuned to a nondirectional radiobeacon and the relative bearing changes from 270° to 260° in 2.5 minutes' elapsed time. The time en route to that beacon would be approximately

M13
1- 6 minutes.
2- 9 minutes.
3- 12 minutes.
4- 15 minutes.

451. With a TAS of 120 knots, suppose the relative bearing on an ADF changes from 090° to 095° in 1 minute elapsed time. The distance to the station would be approximately

M13
1- 12 NM.
2- 16 NM.
3- 18 NM.
4- 24 NM.

452. Suppose the ADF indicates a wingtip bearing change of 10° in 1.5 minutes' elapsed time, and the TAS is 150 knots. What is the approximate distance to the station?

M13
1- 15.0 NM.
2- 22.5 NM.
3- 27.0 NM.
4- 35.5 NM.

453. Suppose the ADF indicates a 5° wingtip bearing change in 2.5 minutes' elapsed time. If the TAS is 125 knots, the distance to the station would be approximately

M13
1- 26.0 NM.
2- 31.2 NM.
3- 56.5 NM.
4- 62.5 NM.

454. Suppose the relative bearing on an ADF changes from 270° to 260° in 2 minutes' elapsed time. If the groundspeed is 155 knots, the distance to that station would be approximately

M13
1- 20 NM.
2- 25.8 NM.
3- 31 NM.
4- 62 NM.

455. Refer to page 81. Which statement is true regarding illustration "F," if the present heading is maintained?

M05
1- The magnetic bearing to the station is 300°.
2- The airplane is on a magnetic heading of 030°.
3- The airplane will intercept the 240 radial at a 45° angle.
4- The airplane will intercept the 060 radial at a 60° angle.

456. Refer to page 81. Which statement is true regarding illustration "E," if the present heading is maintained?

M05
1- The airplane will intercept the 240 radial at a 75° angle.
2- The airplane will intercept the 060 radial at a 75° angle.
3- The magnetic bearing to the station is 345°.
4- The airplane is on a magnetic heading of 360°.

457. Refer to page 81. Which statement is true regarding illustration "A"?

M05
1- The airplane is on a magnetic heading of 040°.
2- The airplane will intercept the 180 radial at a 30° angle.
3- The airplane will intercept the 360 radial at a 30° angle.
4- The magnetic bearing to the station is 220°.

458. Refer to page 81. Which statement is true regarding illustration "D," if the present heading is maintained?

M05
1- The airplane is on a magnetic heading of 240°.
2- The airplane will intercept the 240 radial at a 30° angle.
3- The airplane will intercept the 240 radial at a 15° angle.
4- The magnetic bearing to the station is 240°.

459. Refer to page 81. Which illustration indicates that the airplane will intercept the 360 radial at a 60° angle inbound, if the present heading is maintained?

M05
1- C.
2- D.
3- E.
4- B.

460. Refer to page 81. Which illustration indicates that the airplane will intercept the 060 radial at a 75° angle outbound, if the present heading is maintained?

M05
1- D.
2- E.
3- F.
4- C.

461. Refer to page 81. Which illustration indicates that the airplane should be turned 150° left to intercept the 360 radial at a 60° angle inbound?

M05
1- A.
2- B.
3- C.
4- E.

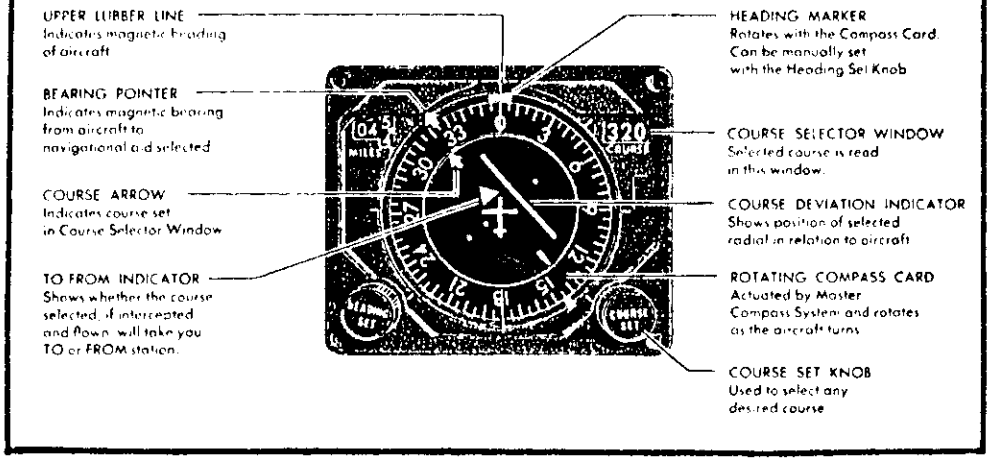
462. When using dual VOR receivers to check each system against the other, the maximum permissible variation between the two indicated bearings is

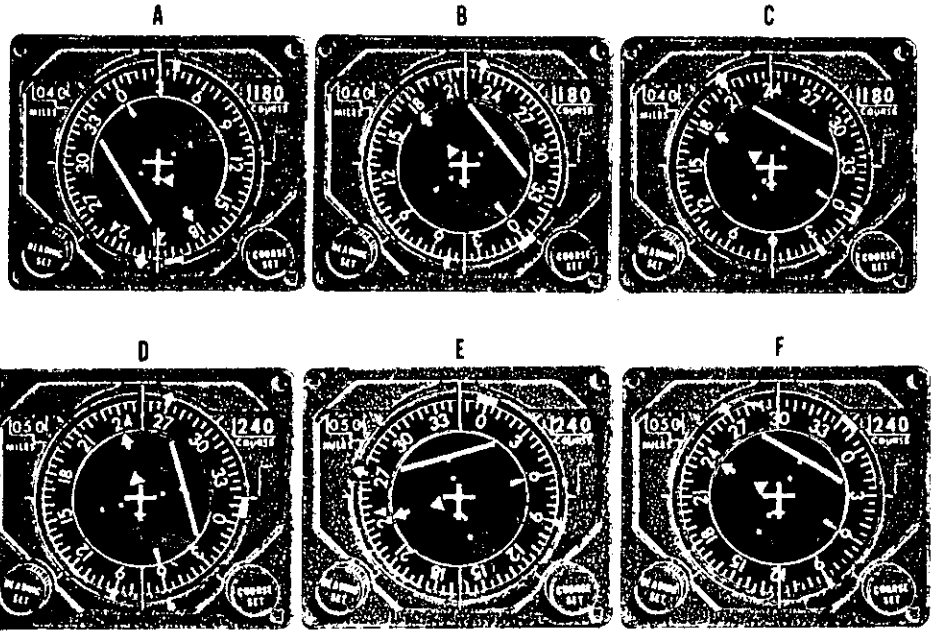
M09
1- 2°.
2- 4°.
3- 6°.
4- 8°.

463. When a VOT is properly used to check the accuracy of a VOR receiver, the CDI should be centered and the omnibearing and TO-FROM indicator reading

M09
1- 0° FROM or 180° TO, regardless of the airplane's position from the VOT.
2- 0° TO, only if the airplane is due south of the VOT.
3- 0° TO or 180° FROM, regardless of the airplane's position from the VOT.
4- 180° FROM, only if the airplane is due north of the VOT.

HORIZONTAL SITUATION INDICATOR (HSI)





464. Suppose the airplane is maintaining a magnetic heading of 175° and the ADF shows a relative bearing of 070°. This indicates that the airplane is crossing the

M13
1- 065° MB FROM that RBN.
2- 245° MB FROM that RBN.
3- 070° MB FROM that RBN.
4- 105° MB FROM that RBN.

465. Suppose the magnetic heading is 295° and the ADF shows a relative bearing of 125°. The magnetic bearing <u>from</u> the radiobeacon would be

M13
1- 060°.
2- 125°.
3- 170°.
4- 240°.

466. Suppose the magnetic heading is 305° and the ADF shows a relative bearing of 135°. The magnetic bearing <u>from</u> the radiobeacon would be

M13
1- 080°.
2- 135°.
3- 170°.
4- 260°.

467. Suppose that the airplane is maintaining a magnetic heading of 275° and the ADF shows a relative bearing of 070°. This indicates that the airplane is crossing the

M13
1- 070° MB FROM the RBN.
2- 165° MB FROM the RBN.
3- 205° MB FROM the RBN.
4- 345° MB FROM the RBN.

468. Suppose the magnetic heading is 285° and the ADF shows a relative bearing of 125°. The magnetic bearing <u>from</u> that radiobeacon would be

M13
1- 050°.
2- 125°.
3- 160°.
4- 230°.

469. If the relative bearing changes from 090° to 100° in 2.5 minutes' elapsed time, the <u>time en route</u> to the station would be approximately

M13
1- 12 minutes.
2- 15 minutes.
3- 18 minutes.
4- 21 minutes.

470. Suppose the ADF is tuned to a nondirectional radiobeacon and the relative bearing changes from 270° to 265° in 1.5 minutes' elapsed time. The <u>time en route</u> to the station would be approximately

M13
1- 12 minutes.
2- 15 minutes.
3- 18 minutes.
4- 21 minutes.

471. Suppose the ADF is tuned to an NDB and the relative bearing changes from 270° to 260° in 1.5 minutes' elapsed time. The <u>time en route</u> to the station would be approximately

M13
1- 6 minutes.
2- 9 minutes.
3- 12 minutes.
4- 15 minutes.

472. Suppose the ADF is tuned to an NDB and the relative bearing changes from 270° to 265° in 1.5 minutes' elapsed time. The <u>time en route</u> to the NDB would be approximately

M13
1- 9 minutes.
2- 12 minutes.
3- 15 minutes.
4- 18 minutes.

473. Suppose the ADF is tuned to a radiobeacon. If the magnetic heading is 035° and the relative bearing is 285°, the magnetic bearing <u>to</u> that radiobeacon would be

M13
1- 140°.
2- 250°.
3- 285°.
4- 320°.

474. Suppose the relative bearing to a radiobeacon is 180° and the magnetic heading is 185°. The magnetic bearing to that radiobeacon would be

M13
1- 005°.
2- 180°.
3- 175°.
4- 185°.

475. Suppose the magnetic heading is 360° and the relative bearing to a radiobeacon is 245°. What would be the magnetic bearing to that radiobeacon?

M13
1- 065°.
2- 115°.
3- 245°.
4- 295°.

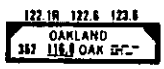
476. Which statement is true regarding "homing" when using ADF during crosswind conditions?

M15
1- Homing to a radio station requires that the ADF have an automatically or manually rotatable azimuth.
2- Homing is a practical navigation method for flying both to and from a radio station.
3- Homing to a radio station results in a curved path that leads to the station.
4- Homing to a radio station is more practical for long distances than for short distances.

477. Which statement is true regarding "tracking" on a desired bearing using ADF during crosswind conditions?

M15
1- When on the desired track inbound with the proper drift correction established, the ADF pointer will be deflected to the windward side of the nose position.
2- When on the desired track outbound with the proper drift correction established, the ADF pointer will be deflected to the windward side of the tail position.
3- To track either inbound or outbound, heading corrections should be made away from the ADF pointer.
4- To track outbound, heading corrections should be made away from the ADF pointer.

478. What service is available through a VOR at which this information appears on aeronautical charts, and on what frequency is it available?



N03
1- Airport advisory service on 116.4 MHz.
2- Stage III service on 122.6 MHz.
3- Radar advisory service on 122.1 MHz.
4- En Route flight advisory service on 122.0 MHz.

479. When checking or listening to the transmission of an emergency locator transmitter (ELT), you should expect to hear

N05
1- a downward sweeping tone.
2- the Morse code for S.O.S.
3- a recorded voice repeating "MAYDAY."
4- a steady high-pitched tone.

480. To check for inadvertent transmission of an ELT at the end of a flight, the VHF receiver should be tuned to which frequency?

N05
1- 121.5 MHz.
2- 121.0 MHz.
3- 122.0 MHz.
4- 122.1 MHz.

481. Which of the following is true regarding the operational testing of ELTs (Emergency Locator Transmitters)?

N05
1- Airborne tests are not authorized.
2- Tests are permitted to last as long as 3 minutes.
3- Tests should be made at 30 minutes past the hour.
4- Tests are mandatory every 10 hours of flight time or within 10 days preceding a flight.

482. To use VHF/DF facilities for assistance in locating an airplane's position, the airplane must have an operative VHF

N05
1- transmitter and receiver.
2- transmitter and receiver, and an ELT.
3- transmitter and receiver, and a VOR receiver.
4- transmitter and receiver, and an ADF receiver.

483. To obtain airport advisory service from an FSS, the pilot should contact the facility by transmitting on

N07
1- 123.6 MHz.
2- 122.8 MHz.
3- 121.5 MHz.
4- 122.0 MHz.

484. En route weather advisories should be obtained from an FSS on the frequency of

N07
1- 122.1 MHz.
2- 122.0 MHz.
3- 123.6 MHz.
4- 122.4 MHz.

485. Refer to page 85. At the position indicated by instrument group "A", what would the relative bearing be if the airplane were turned to a magnetic heading of 090°?

M13
1- 090°.
2- 150°.
3- 190°.
4- 250°.

486. Refer to page 85. If the airplane continues its present heading as shown in instrument group "C", what will the ADF indicate when the airplane reaches the magnetic bearing of 030° from the NDB?

M13
1- 060°.
2- 120°.
3- 240°.
4- 300°.

487. Refer to page 85. If the airplane continues its present heading as shown in instrument group "A", what will the ADF indicate when the airplane reaches the magnetic bearing of 180° from the NDB?

M13
1- 060°.
2- 160°.
3- 180°.
4- 360°.

488. Refer to page 85. If the airplane continues its present heading as shown in instrument group "D", on what magnetic bearing from the NDB would it be when the ADF pointer reaches 295°?

M13
1- 115°.
2- 125°.
3- 135°.
4- 295°.

489. Refer to page 85. Which group of instruments indicates a magnetic bearing of 240° to the NDB?

M13
1- A.
2- B.
3- C.
4- D.

490. Refer to page 85. Which group of instruments indicates a magnetic bearing of 340° to the NDB?

M13
1- A.
2- B.
3- C.
4- D.

491. Refer to page 85. Which group of instruments indicates a magnetic bearing of 320° from the NDB?

M13
1- A.
2- B.
3- C.
4- D.

492. Refer to page 85. Which group of instruments indicates the airplane to be on the 140° magnetic bearing from the NDB?

M13
1- A.
2- B.
3- C.
4- D.

493. Refer to page 85. Which group of instruments indicates the airplane to be on the 060° magnetic bearing from the NDB?

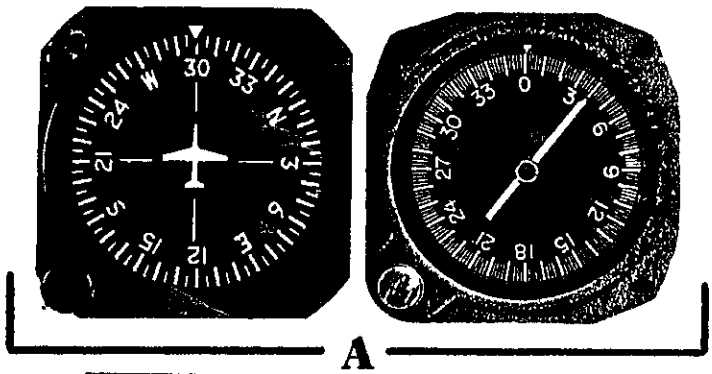
M13
1- A.
2- B.
3- C.
4- D.

494. Refer to instrument group "A" on page 85. To intercept the 330° magnetic bearing to the NDB at a 30° angle, the airplane should be turned

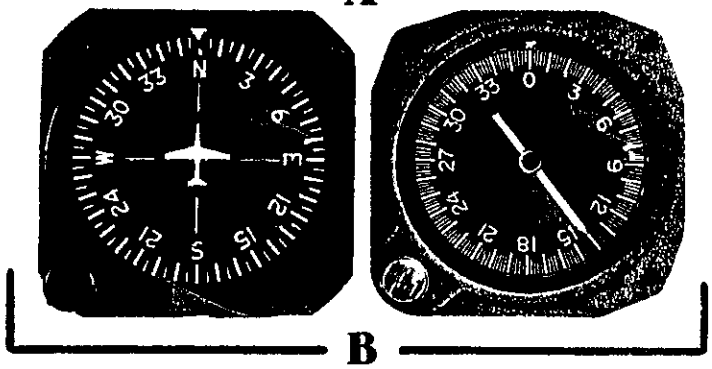
M14
1- right to a heading of 330°.
2- right to a heading of 360°.
3- left to a heading of 270°.
4- left to a heading of 240°.

495. If the relative bearing to a radiobeacon is 135° and the magnetic heading is 135°, what is the magnetic bearing to that radiobeacon?

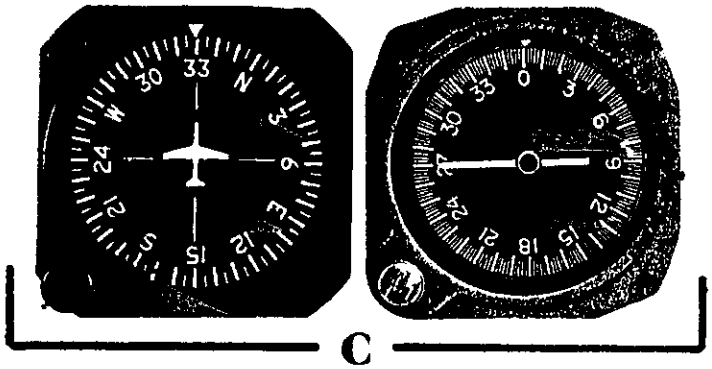
M13
1- 090°.
2- 135°.
3- 180°.
4- 270°.



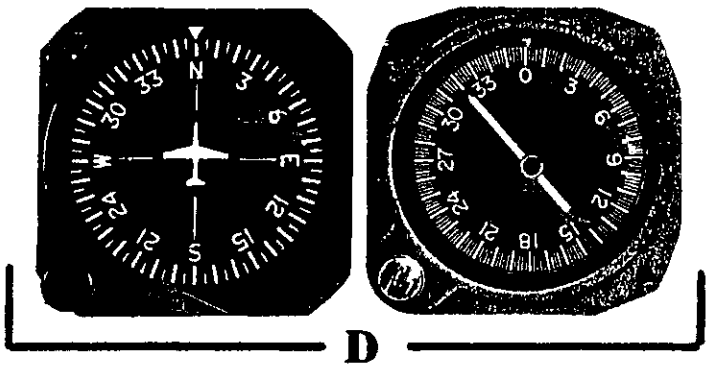
A



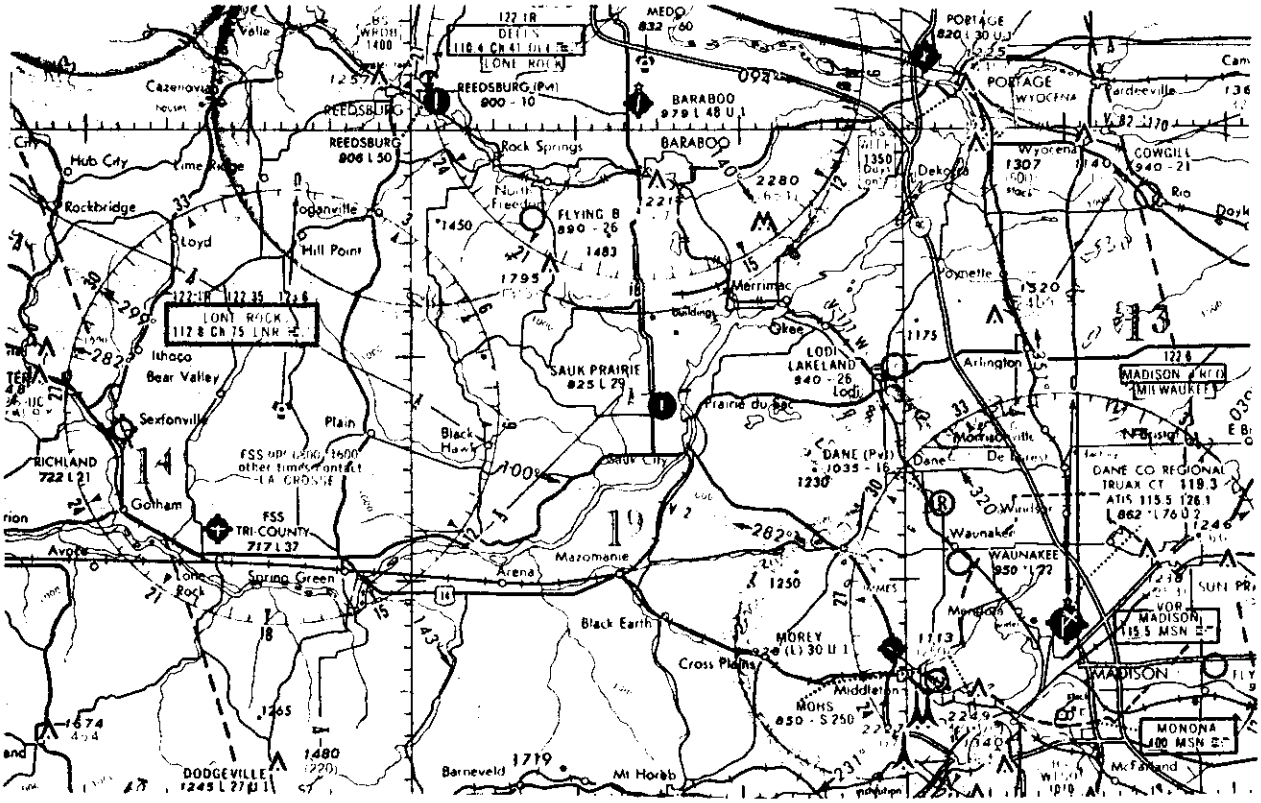
B



C



D



496. Refer to the chart above. If intending to land at Dane Co. Regional Airport (lower right) when the ceiling is less than 1,000 feet, radio communications should first be established with

NO7
1- Truax Tower on 119.3 MHz before entering the traffic pattern.
2- Milwaukee FSS or Madison Radio on 122.6 MHz before reaching a point 5 miles from the airport.
3- Madison Radio on 115.5 MHz when within a radius of 5 miles from the airport.
4- Madison Tower on 119.3 MHz when 3 miles from the airport.

497. Refer to the chart above. The appropriate means of obtaining information on the local weather and runway and approaches in use at Dane Co. Regional Airport (lower right), is to tune to the

NO7
1- Airport Terminal Information Service on 115.5 or 126.1 MHz.
2- Radar Traffic Information Service on approach control frequency 126.1 MHz.
3- Transcribed Weather Broadcast on the Monona nondirectional radiobeacon frequency 400 kHz.
4- VFR Advisory Service on the FSS frequency 122.6 MHz.

498. Refer to the chart above. How should a VFR flight plan be "activated" after departing Dane County Regional Airport (lower right)?

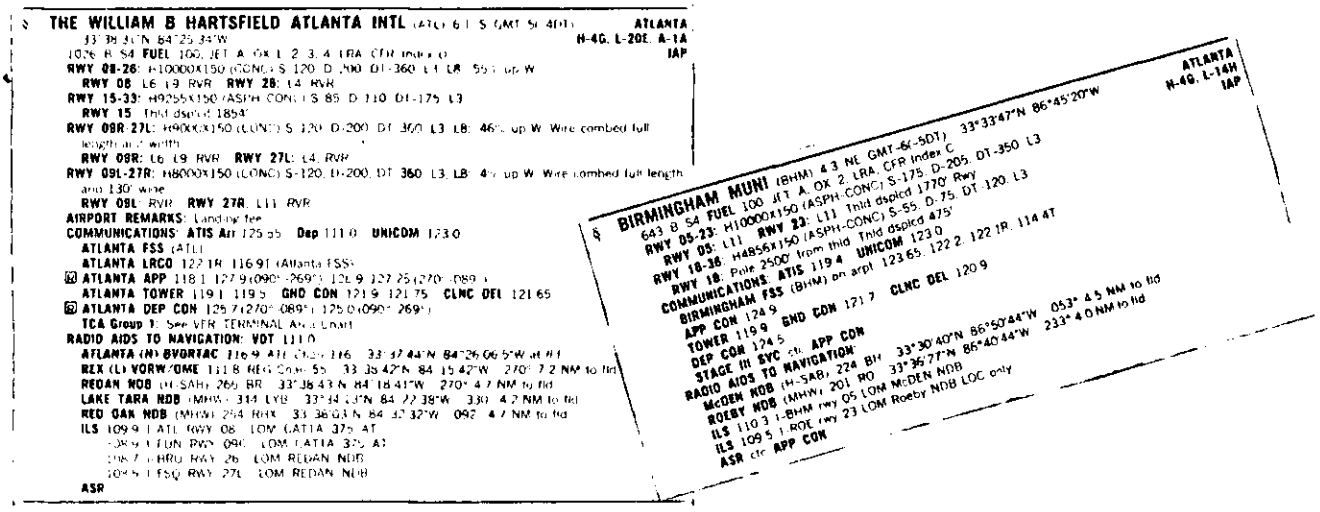
NO7
1- Contact Madison Radio on 122.6 MHz, and request that they activate the flight plan.
2- Ask Truax Tower to activate the flight plan just after takeoff.
3- Contact Dane County departure control on 125.5 MHz after becoming airborne, and request that the flight plan be activated.
4- Contact Madison Flight Service on 115.5 MHz, and request that they activate the flight plan.

499. Refer to the chart above. To close a VFR flight plan when nearing Dane County Regional Airport (lower right), the pilot can do so by transmitting on

NO7
1- 122.1 and receiving on 115.5 MHz.
2- 122.4 and receiving on 122.4 MHz.
3- 122.6 and receiving on 122.6 MHz.
4- 123.6 and receiving on 123.6 MHz.

500. Refer to the chart above. When passing Dells VORTAC (top center), the latest Tri-County Airport weather can be obtained through Dells VORTAC by transmitting on

NO7
1- 110.4 and receiving on 122.1 MHz.
2- 110.4 and receiving on 123.6 MHz.
3- 122.1 and receiving on 110.4 MHz.
4- 122.2 and receiving on 123.0 MHz.



§ **THE WILLIAM B HARTSFIELD ATLANTA INTL** (ATL) 6 I S (GMT-5) 4(DT) **ATLANTA**
33°38.3'N 84°25.3'W **H-4G, L-20E, A-1A**
1026 B S4 **FUEL** 100, JET A OX 1, 2, 3, 4 LRA CFR Index D **IAP**
RWY 08-26: H10000X150 (CONC) S-120 D-200 DT-360 L4 LR 55° up W
RWY 08 L6, L9 RVR **RWY 26:** L4 RVR
RWY 15-33: H9255X150 (ASPH-CONC) S-85 D-110 DT-175 L3
RWY 15 Thld dsplcd 1854'
RWY 09R-27L: H9000X150 (CONC) S-120 D-200 DT-360 L3 LR: 46° up W Wire combed full length and width
RWY 09R: L6, L9 RVR **RWY 27L:** L4 RVR
RWY 09L-27R: H8000X150 (CONC) S-120 D-200 DT-360 L3 LR: 47° up W Wire combed full length and 130' wide
RWY 09L: RVR **RWY 27R:** L11 RVR
AIRPORT REMARKS: Landing fee
COMMUNICATIONS: ATIS Arr 125.95 **Dep** 111.0 **UNICOM** 123.0
ATLANTA FSS (ATL)
ATLANTA LRCO 122.1R 116.9T (Atlanta FSS)
Ⓐ **ATLANTA APP** 118.1 127.9 (090°-269°) 125.9 127.25 (270°-089°)
ATLANTA TOWER 119.1 119.5 **GND CON** 121.9 121.75 **CLNC DEL** 121.65
Ⓓ **ATLANTA DEP CON** 125.7 (270°-089°) 125.0 (090°-269°)
TCA Group 1: See VFR TERMINAL Area Chart
RADIO AIDS TO NAVIGATION: VOT 111.0
ATLANTA (N) BVORTAC 116.9 ATL Chan 116 33°37'44"N 84°26'06"W at 41
REX (L) VORW/DME 111.8 REG Chan 55 33°35'42"N 84°15'42"W 270° 7.2 NM to fld
REDAN NDB (H-SAB) 266 BR 33°38'43"N 84°18'41"W 270° 4.7 NM to fld
LAKE TARA NDB (MHW) 344 LYB 33°34'.0"N 84°22'38"W 330° 4.2 NM to fld
RED OAK NDB (MHW) 254 RKK 33°36'03"N 84°37'32"W 092° 4.7 NM to fld
ILS 109.9 I-ATL RWY 08 LOM CATIA 375° AT
I-FUN RWY 09L LOM CATIA 375° AT
I-HRU RWY 26 LOM REDAN NDB
I-FSQ RWY 27L LOM REDAN NDB
ASR

§ **BIRMINGHAM MUNI** (BHM) 4.3 NE GMT-6(-5DT) 33°33'47"N 86°45'20"W **ATLANTA**
643 B S4 **FUEL** 100 JET A OX 2 LRA CFR Index C **H-4G, L-14H**
RWY 05-23: H10000X150 (ASPH-CONC) S-175 D-205 DT-350 L3 **IAP**
RWY 05: L11 **RWY 23:** L11 Thld dsplcd 1770' Rwy
RWY 18-36: H4856X150 (ASPH-CONC) S-55 D-75 DT-120 L3
RWY 18: Pole 2500' from thld Thld dsplcd 475'
COMMUNICATIONS: ATIS 119.4 **UNICOM** 123.0
BIRMINGHAM FSS (BHM) on arpt 123.65 122.2 122.1R 114.4T
APP CON 124.9
TOWER 119.9 **GND CON** 121.7 **CLNC DEL** 120.9
DEP CON 124.5
STAGE III SYC ctc **APP CON**
RADIO AIDS TO NAVIGATION:
McDEN NDB (H-SAB) 224 BH 33°30'40"N 86°50'44"W 053° 4.5 NM to fld
ROEBY NDB (MHW) 201 RO 33°36'27"N 86°40'44"W 233° 4.0 NM to fld
ILS 110.3 I-BHM rwy 05 LOM McDEN NDB
ILS 109.5 I-ROE rwy 23 LOM Roeby NDB LOC only
ASR ctc **APP CON**

501. Refer to the airport directory above. VFR arrivals to Atlanta Intl. Airport from the southwest should contact Atlanta Approach Control on frequency

NO7
1- 125.7 MHz.
2- 118.1 or 127.9 MHz.
3- 119.1 or 119.5 MHz.
4- 126.9 or 127.25 MHz.

502. Refer to the airport directory above. VFR arrivals to Birmingham Mun. Airport from the south should contact Birmingham Approach Control on frequency

NO7
1- 118.7 MHz.
2- 119.9 MHz.
3- 124.5 MHz.
4- 124.9 MHz.

503. Refer to the airport directory above. Which is true regarding VFR departures from the Atlanta Intl. Airport?

NO7
1- The initial radio communication when departing Atlanta Intl. Airport ramp must be made with the Atlanta Control Tower.
2- Radio communication with Atlanta Departure Control is encouraged but not mandatory.
3- Radio communication with Atlanta Departure Control is mandatory.
4- Radio communication with Atlanta ATIS is mandatory prior to takeoff.

504. Refer to the airport directory above. VFR arrivals to Birmingham Mun. Airport from the north should contact Birmingham Approach Control on frequency

NO7
1- 118.7 MHz.
2- 119.9 MHz.
3- 124.5 MHz.
4- 124.9 MHz.

505. Refer to the airport directory above. Which is true regarding VFR arrivals to the Atlanta Intl. Airport?

NO7
1- The initial radio communication must be made with Atlanta Control Tower.
2- Radio communication with Atlanta ATIS is mandatory prior to landing.
3- Radio communication with Atlanta Approach Control is encouraged but not mandatory.
4- Radio communication with Atlanta Approach Control is mandatory.

506. Refer to the airport directory above. Which is true regarding VFR arrivals to the Birmingham Mun. Airport?

NO7
1- Radio communication with Birmingham Approach Control is encouraged but not mandatory.
2- Radio communication with Birmingham Approach Control is mandatory.
3- Radio communication with Birmingham ATIS is mandatory prior to landing.
4- The initial radio communication must be made with the Birmingham FSS.

507. On page 89, which RMI indicates the airplane to be on the 135° magnetic bearing from the station?

M13
1- A.
2- D.
3- H.
4- I.

508. Refer to page 89 and determine which illustration indicates an airplane to be inbound on a magnetic bearing of 315° to the station.

M13
1- H.
2- I.
3- D.
4- A.

509. Refer to RMI illustration "B" on page 89. What is the magnetic bearing to the station?

M13
1- 090°.
2- 115°.
3- 125°.
4- 295°.

510. On page 89, which RMI shows the airplane to be located on the 135° magnetic bearing from the station and getting closer to the station?

M13
1- A.
2- D.
3- H.
4- I.

511 Refer to page 89 and determine which of the following illustrations indicates an airplane to be outbound on a magnetic bearing of 315° from the station.

M13
1- A.
2- C.
3- D.
4- I.

512. Refer to RMI illustration "H" on page 89. What is the magnetic bearing to the station?

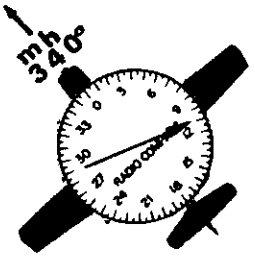
M13
1- 135°.
2- 225°.
3- 270°.
4- 315°.

513. Refer to the illustration above. To intercept a magnetic bearing of 240° from at a 030° angle (while outbound), the airplane should be turned

M14
1- right 125°.
2- left 065°.
3- left 125°.
4- left 270°.

514. Based on the illustration above, if the airplane continues to fly on the heading as shown, what magnetic bearing from the station would be intercepted at a 035° angle outbound?

M14
1- 035°.
2- 070°.
3- 215°.
4- 250°.

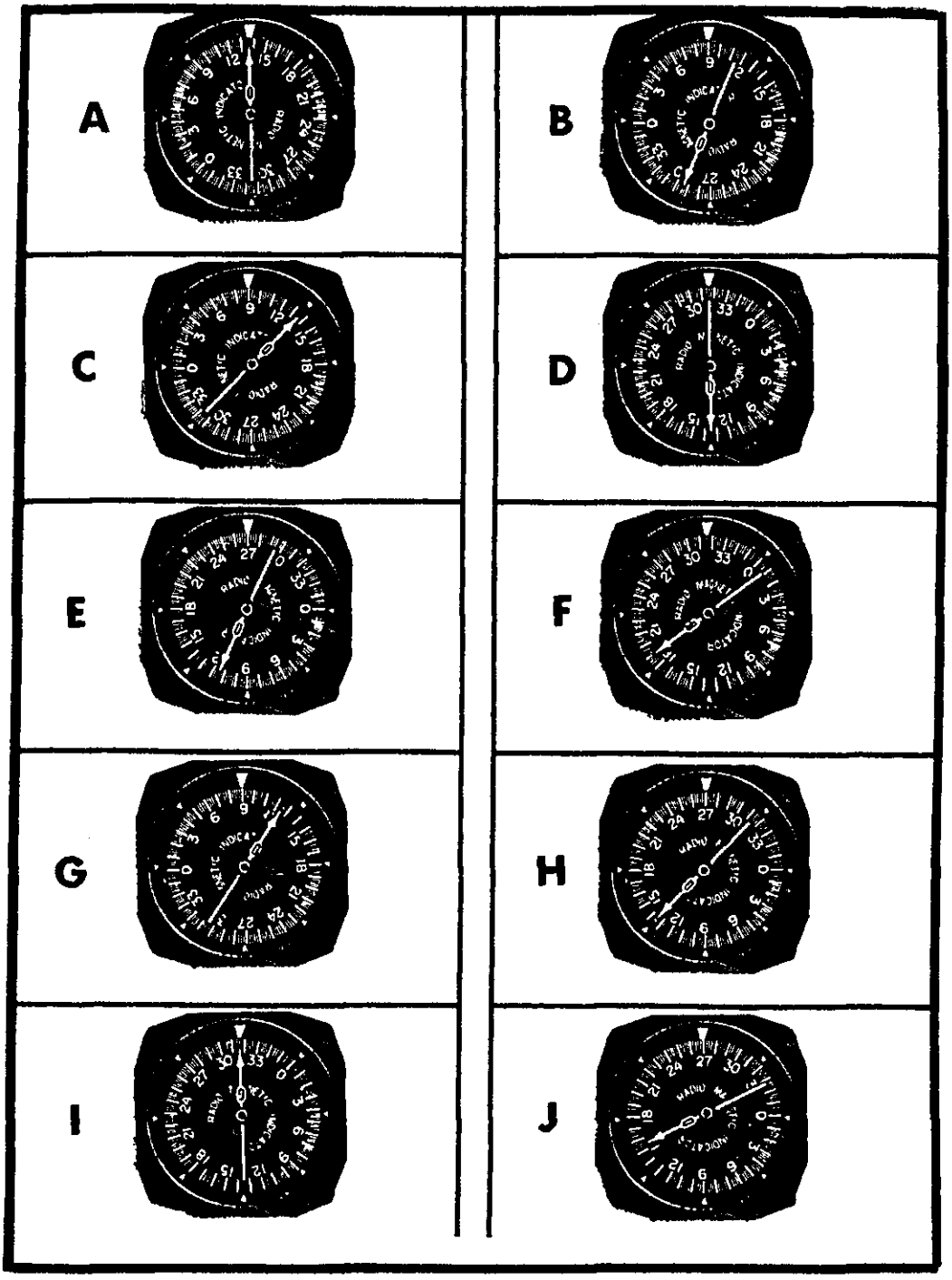


515. Based on the illustration above, if the airplane continues to fly on the magnetic heading as illustrated, what magnetic bearing from the station would be intercepted at a 035° angle?

M14
1- 090°.
2- 270°.
3- 305°.
4- 335°.

516. Based on the illustration above, if the airplane continues to fly on the magnetic heading as illustrated, what magnetic bearing from the station would be intercepted at a 030° angle?

M14
1- 030°.
2- 090°.
3- 270°.
4- 310°.


A
B
C
D
E
F
G
H
I
J

517. Which of the following actions is necessary to make the airplane turn?

004
1- Change the direction of thrust.
2- Change the direction of lift.
3- Yaw the airplane.
4- Increase the angle of attack.

518. Generally speaking, which of the following statements is true concerning a stabilized or steady-state descent?

004
1- Lift is equal to weight.
2- Thrust is greater than drag.
3- Drag is greater than thrust.
4- Weight is greater than lift.

519. When the airspeed of an airplane is doubled and the angle of attack remains constant, what is the effect on parasite drag?

004
1- Drag doubles.
2- Drag increases four times.
3- Drag remains constant.
4- Drag decreases by one-half.

520. When the airspeed of an airplane is doubled and the angle of attack is held constant, the parasite drag will be

004
1- twice as great.
2- four times as great.
3- less than it was initially.
4- the same as it was initially.

521. The force of lift acting on the airfoil is considered to act through one point which is called the

004
1- center of rotation.
2- center of pressure.
3- center of gravity.
4- midpoint of the chord.

522. In regard to lift, drag, thrust, or weight, which statement is true?

004
1- Thrust always acts through the center of gravity.
2- All four forces always act through a common center.
3- The four forces may act through centers which are not in line.
4- The lift force always acts through the center of gravity.

523. Which of the following should be increased in order to maintain altitude during a medium to steep turn?

006
1- Centrifugal force.
2- Angle of attack or airspeed.
3- Power output.
4- Angle of bank.

524. When the pitch attitude of an airplane is being changed, the airplane rotates about the

005
1- center of pressure.
2- midpoint of the fuselage.
3- center of gravity.
4- midpoint of the chord line of the wing.

525. Rotation about the vertical axis of an airplane is known as

005
1- yawing, and is controlled by the use of rudder.
2- rolling, and is controlled by the use of ailerons.
3- turning, and is controlled by the use of ailerons.
4- pitching, and is controlled by the use of elevators.

526. Which statement is true about adverse yaw when entering or rolling out of a turn?

006
1- Adverse yaw is always away from the direction of turn.
2- Adverse yaw is always toward the direction of turn.
3- Adverse yaw is not a factor when rolling out of a turn.
4- Adverse yaw can be either toward or away from the direction of turn.

527. When rolling out of a steep-banked turn, what causes the lowered aileron to create more drag than when rolling into the turn?

006
1- The differential in aileron travel is greater.
2- The wing's angle of attack is greater as the rollout is started.
3- The wing being raised is traveling faster through the air than the wing being lowered.
4- The wing being lowered is traveling faster through the air and producing more lift than the wing being raised.

528. As it applies to airfoils, which statement is in agreement with Bernoulli's Principle?

001
1- The speed of a fluid increases at points where the pressure of the fluid increases.
2- The pressure of a fluid decreases at points where the speed of the fluid increases.
3- The pressure of a fluid increases at points where the speed of the fluid increases.
4- The pressure of a fluid decreases at points where the speed of the fluid decreases.

529. Choose the true statement pertaining to a slip or skid in an airplane.

002
1- A skid occurs when too much rudder is applied in the direction opposite the turn.
2- A skid occurs when the rate of turn is too fast for the amount of bank being used.
3- In a right descending turn, if excessive right rudder is applied to compensate for the decreased torque effect, a slip will result.
4- In a left climbing turn, if insufficient right rudder is applied to compensate for the increased torque effect, a slip will result.

530. Choose the true statement pertaining to a slip or skid in an airplane.

002
1- In a right descending turn, if excessive left rudder is applied to compensate for the decreased torque effect, a slip will result.
2- In a left climbing turn, if insufficient right rudder is applied to compensate for the increased torque effect, a slip will result.
3- A skid occurs when too much rudder is applied in the direction opposite the turn.
4- A skid occurs when the rate of turn is too slow for the amount of bank being used.

531. The rate of turn during flight is the primary function of which flight control?

002
1- Rudder.
2- Elevator.
3- Ailerons.
4- Rudder and elevator.

532. Which statement is true concerning the primary function of each flight control during flight?

002
1- The ailerons are intended to create an unbalanced drag on the wings to yaw the airplane in the desired direction of turn.
2- The rudder is intended to be used as an elevator to hold the airplane's nose up in steep turns.
3- The elevator is intended to control the rate of turn during steep turns.
4- The ailerons provide a means for controlling the direction and rate of turn.

533. An increase in the speed at which an airfoil passes through the air increases lift because

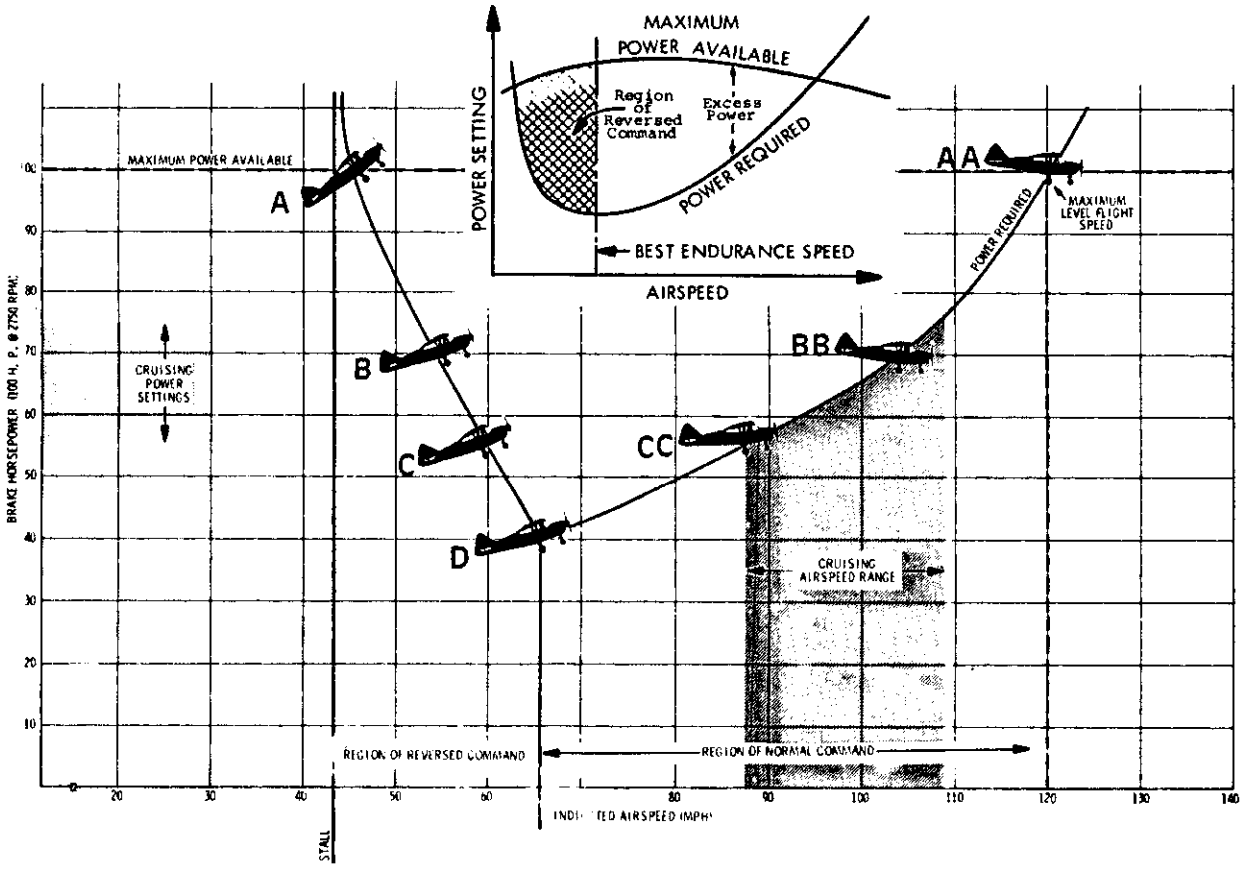
003
1- the increased speed of the air passing over the airfoil's upper surface decreases the pressure, thus creating a greater pressure differential between the upper and lower surfaces.
2- the increased speed of the airflow creates a lesser pressure differential between the upper and lower airfoil surfaces.
3- the increased velocity of the relative wind increases the angle of attack.
4- the impact pressure of the air on the lower surface of the airfoil creates less positive pressure.

534. When increasing the angle of attack of an airfoil, lift is increased because the higher angle of attack (up to the stall angle) results primarily in

003
1- a reduction in profile drag.
2- a decrease in induced drag.
3- a decrease in the air velocity over the airfoil's upper surface.
4- a greater downward deflection of the airflow.

535. Increasing airspeed while maintaining a constant load factor during a level turn would result in

004
1- an increase in the radius of turn.
2- a decrease in the radius of turn.
3- the same radius of turn.
4- an increase in centrifugal force.



536. Refer to the chart above. Which statement is true regarding airplane B?

010
1- A reduction in airspeed requires less power to maintain steady, level flight.
2- The airplane would settle if the airspeed were reduced and the power were not increased.
3- If the airspeed were increased and the power remained unchanged, steady, level flight would result.
4- Steady, level flight would result if the airspeed were decreased and the power were decreased.

537. Refer to the chart above. In which airspeed range is the region of reversed command?

010
1- 0-42 MPH.
2- 44-66 MPH.
3- 67-87 MPH.
4- 88-109 MPH.

538. Refer to the chart above. If the airspeed of airplane B were decreased, which statement would be true?

010
1- If 70 HP is the maximum available power at a high density altitude the airplane would settle or stall.
2- The maximum available power at any density altitude would be adequate to prevent settling.
3- To maintain steady, level flight the power must be decreased.
4- The airplane would settle if the power is increased.

539. Refer to the chart above. Which statement is true with regard to maintaining steady, level flight?

010
1- Power required at 45 MPH is the same as required at 120 MPH.
2- Power required at 45 MPH is less than required at 66 MPH.
3- Power required increases as airspeed is increased in the region of reversed command.
4- Power required increases as airspeed decreases in the cruising airspeed range.

540. Which would be the most likely problem to arise in regard to ground effect?

014
1- Retracting the landing gear before a definite climb is established on takeoff.
2- Stalling prematurely during the roundout for landing.
3- Touching down prematurely while rounding out for landing.
4- Lifting off at too great an airspeed during takeoff.

541. Suppose an airplane weighs 2,850 lbs. What air load would result if a load factor of 4.2 were imposed on the airplane's structure?

017
1- 11,970 lbs.
2- 8,550 lbs.
3- 5,700 lbs.
4- 2,850 lbs.

542. If an airplane's gross weight is 2,950 lbs., what is the load acting on this airplane during a level 60° banked turn?

017
1- 2,950 lbs.
2- 3,010 lbs.
3- 4,425 lbs.
4- 5,900 lbs.

543. If an airplane's gross weight is 2,850 lbs., what is the load acting on this airplane during a level 60° banked turn?

017
1- 5,700 lbs.
2- 4,275 lbs.
3- 2,910 lbs.
4- 2,850 lbs.

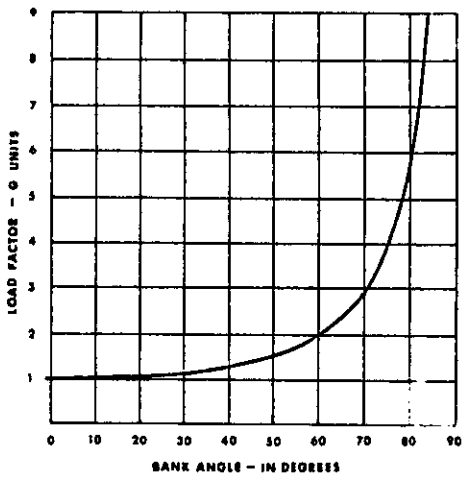
544. If an airplane's gross weight is 2,675 lbs., what is the load acting on this airplane during a level 60° banked turn?

017
1- 5,350 lbs.
2- 4,012.5 lbs.
3- 2,735 lbs.
4- 2,675 lbs.

545. If a load factor of 2.5 was imposed on an airplane that weighs 2,675 lbs., the air load imposed on that airplane would be

017
1- 2,675 lbs.
2- 4,012.5 lbs.
3- 5,350 lbs.
4- 6,687.5 lbs.

LOAD FACTOR CHART



546. Refer to the illustration above. If an airplane were flown in a 55° banked turn at a constant altitude, what load factor would result?

017
1- 1.7 G's.
2- 2.0 G's.
3- 3.7 G's.
4- 4.3 G's.

547. Refer to the illustration above. If an airplane were flown in a 65° banked turn at a constant altitude, what load factor would result?

017
1- 2.4 G's.
2- 3.4 G's.
3- 4.0 G's.
4- 5.0 G's.

548. Refer to the illustration above. If an airplane has a limit load factor of 3.5, what angle of bank would cause the airplane to exceed that limit?

017
1- 63°.
2- 65°.
3- 68°.
4- 72°.

549. Suppose an airplane weighs 2,750 lbs. What air load would result if a load factor of 2.8 were imposed on the airplane's structure?

017
1- 7,700 lbs.
2- 5,500 lbs.
3- 4,125 lbs.
4- 2,750 lbs.

550. Why is it necessary to increase back elevator pressure to maintain altitude during a medium to steep banked turn?

006
1- The rudder's function has been transferred to the elevator as the bank approaches 45°.
2- To keep the airplane's nose moving in the direction of the turn.
3- To compensate for the loss of total lift in the banked attitude.
4- To compensate for the effect of inertia and centrifugal force on the airplane.

551. What determines the angle of attack at which a given airplane stalls?

007
1- Relative wind.
2- Airplane gross weight.
3- True airspeed.
4- Load factor.

552. Generally speaking, lift always acts perpendicular to the

007
1- chord line of the wing.
2- relative wind.
3- ground.
4- force of gravity.

553. The critical angle of attack at which a given airplane stalls is dependent on the

007
1- airplane's gross weight.
2- airplane's airspeed.
3- degree of bank.
4- design of the wing.

554. Which statement is true in regard to the lift developed by a wing?

007
1- The sole factor that produces lift is the camber of the top surface of the wing causing reduced air pressure.
2- The sole factor that produces lift is the deflection of air downward causing an equal and opposite reaction upward.
3- Lift results from a pressure differential between the top and bottom of the wing, and from air being deflected downward and forcing the wing upward.
4- Lift results solely from a pressure differential between the top and bottom of the wing, created by the airplane's speed, and is not related to the downward deflection of the air.

555. What effect will a decrease in air density have on lift and drag?

008
1- Lift will increase and drag will decrease.
2- Lift and drag will increase.
3- Lift and drag will decrease.
4- Lift will decrease and drag will increase.

556. What adverse effect does frost on the wings have on an airplane?

009
1- It changes the basic aerodynamic shape of the wing.
2- It disrupts the smooth flow of air over the wing.
3- It decreases the airplane's stall speed.
4- It increases the airplane's weight significantly.

557. What precaution is recommended if structural icing should form on the airplane during flight?

009
1- Change altitude as slowly as possible to reach warmer air.
2- Use a lower than normal airspeed during a climb.
3- Avoid abrupt maneuvers.
4- Use a lower than normal airspeed on landing approach.

558. The maximum rate of climb performance of a given airplane is primarily governed by the

010
1- available power in excess of that needed for cruising flight.
2- wind velocity.
3- airplane's actual gross weight.
4- total amount of lift.

559. The tendency of an airplane to yaw to the left as the nose is suddenly pitched down at a high-power setting is due to the

011
1- asymmetrical thrust produced by a difference in angle of attack between the ascending and descending blades of the propeller.
2- force applied to the disc of the rotating propeller taking effect 90° ahead in the direction of rotation.
3- spiral flow of the prop wash or slipstream striking the left side of the vertical fin.
4- clockwise rotation of the engine and propeller causing an opposite and equal reaction.

560. With regard to gyroscopic precession, when a force is applied at a point on the rim of a spinning disc the resultant force acts in which direction and at what point?

011
1- In the same direction as the applied force, at the point of the applied force.
2- In the opposite direction of the applied force, at the point of the applied force.
3- In the same direction as the applied force, 90° ahead in the plane of rotation.
4- In the opposite direction of the applied force, 90° ahead in the plane of rotation.

561. What is the reason an airplane tends to yaw to the left when the nose is abruptly pitched down with the power on?

011
1- Asymmetrical thrust of the propeller blades.
2- Gyroscopic reaction of the propeller.
3- Wash-in and washout of the wingtips.
4- Reaction to the engine's torque.

562. What is a common result of ground effect during a takeoff or a landing?

014
1- Stalling prematurely during a landing.
2- Lifting off at a higher-than-normal airspeed.
3- Accelerating at a faster-than-normal rate during a takeoff.
4- Floating during a landing.

563. When an airplane is flown within ground effect, the phenomenon has a tendency to

014
1- change the direction of the relative wind, thus producing the same lift coefficient at a smaller angle of attack.
2- increase the induced drag, thus reducing the groundspeed.
3- increase the angle of attack, thus increasing the stall speed.
4- make the wing less efficient, thus requiring a longer ground run for takeoff.

564. Which of the following is a result of ground effect?

014
1- An increase in the wing's downwash with no increase in angle of attack.
2- An increase in wingtip vortices at a given angle of attack.
3- An increase in lift with no increase in angle of attack.
4- An increase in induced drag with no change in angle of attack.

565. Under which situation is ground effect most likely to be encountered?

014
1- When flying approximately 100 feet above the surface.
2- During radiational heating from the ground surface.
3- During wind conditions where obstructions produce turbulence.
4- When flying within a distance of one wingspan above the surface.

566. Which statement is true concerning ground effect?

014
1- A smaller angle of attack in ground effect can produce the same lift coefficient as a larger angle out of ground effect.
2- With a constant angle of attack the induced drag increases in ground effect.
3- With a constant angle of attack the wing's downwash increases in ground effect.
4- At a given angle of attack the wingtip vortices increase in ground effect.

567. During maneuvering flight such as turns or pullouts from dives, the increased load imposed on the wings is caused by

017
1- the airplane's speed.
2- centrifugal force.
3- gravitational force.
4- induced drag.

568. When an airplane transitions from straight-and-level flight into a coordinated turn while maintaining a constant altitude, the total lift force must

017
1- increase; the load factor will decrease.
2- remain constant; the load factor will increase.
3- remain constant; the load factor will decrease.
4- increase; the load factor will increase.

569. Why does a tailwheel type airplane have a tendency to "weathervane" or turn into the wind during ground operations?

018
1- The engine is higher than the tail, preventing propwash from exerting a force on the vertical fin and rudder.
2- More side surface is exposed to the wind aft of the main wheels than forward of the main wheels.
3- The tailwheel is nonsteerable, so only the rudder can be used for directional control.
4- The CG is located behind the main wheels, thereby creating a greater turning moment.

570. Why is the tendency to "groundloop" greater in tailwheel type airplanes than in nosewheel types? Primarily because in tailwheel types the

018
1- pilot's forward vision is obscured when in the three-point attitude, whereas in nosewheel types the pilot has a clear view ahead.
2- CG is aft of the main wheels, whereas it is forward of the main wheels in nosewheel types.
3- CG is forward of the main wheels, whereas it is aft of the main wheels in nosewheel types.
4- control of direction is accomplished by use of the rudder only, whereas all nosewheel types have nosewheel steering.

571. Which statement is true concerning the aerodynamic design of most general aviation type airplanes?

018
1- The center of gravity is forward of the center of pressure.
2- The center of pressure is forward of the center of gravity.
3- The center of gravity is below the thrust line.
4- The thrust line is above the center of drag.

572. The reason an airplane tends to nose down when power is reduced to idle is that the

018
1- force of drag acts horizontally and above the thrust line.
2- center of gravity is located forward of the center of pressure.
3- center of pressure is located forward of the center of gravity.
4- thrust was acting parallel to and above the force of drag.

573. If the airplane's aft CG limit is exceeded, it will result in

018
1- higher stalling speeds.
2- higher elevator control forces making it difficult for the pilot to maneuver the airplane.
3- very light elevator control forces which make it easy to inadvertently overstress the airplane.
4- increased longitudinal stability making it difficult for the pilot to change the airplane's attitude.

574. If the airplane's forward CG limit is exceeded, it will affect the flight characteristics of the airplane by producing

018
1- very light elevator control forces which make it easy to inadvertently overstress the airplane.
2- decreased stability and greater ease in establishing the proper landing and takeoff attitude.
3- improved performance since it reduces the induced drag.
4- higher stalling speeds and more longitudinal stability.

575. If an airplane weighs 2,850 lbs., what air load would result if a load factor of 3.2 were imposed on the airplane's structure?

017
1- 2,850 lbs.
2- 4,275 lbs.
3- 5,700 lbs.
4- 9,120 lbs.

576. Assume an airplane has a normal stalling speed of 62 MPH, but is forced into an accelerated stall at twice that speed. What maximum load factor will result from this maneuver?

017
1- 1 G.
2- 2 G's.
3- 3 G's.
4- 4 G's.

577. The load imposed on the wings of an airplane during a level coordinated turn in smooth air is primarily dependent on the

017
1- angle of bank.
2- true airspeed.
3- density altitude.
4- rate of turn.

578. If an airplane's gross weight is 2,600 lbs., what is the load acting on this airplane during a level 60° banked turn?

017
1- 3,500 lbs.
2- 4,500 lbs.
3- 5,000 lbs.
4- 5,200 lbs.

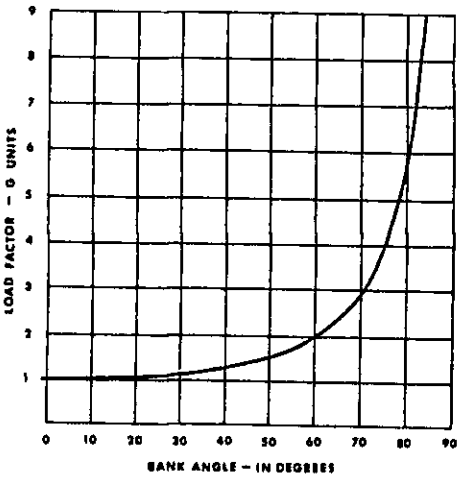
579. If an airplane's gross weight is 2,800 lbs., what is the load acting on this airplane during a level 60° banked turn?

017
1- 4,000 lbs.
2- 5,200 lbs.
3- 5,400 lbs.
4- 5,600 lbs.

580. If an airplane's gross weight is 3,000 lbs., what is the load acting on this airplane during a level 60° banked turn?

017
1- 6,000 lbs.
2- 5,500 lbs.
3- 5,000 lbs.
4- 3,500 lbs.

LOAD FACTOR CHART



581. Refer to the illustration above. If an airplane has a limit load factor of 3.8, what angle of bank would cause the airplane to exceed that limit?

017
1- 68°.
2- 70°.
3- 72°.
4- 75°.

582. Refer to the illustration above. If an airplane were flown in a 75° banked turn at a constant altitude, what load factor would result?

017
1- 1 G.
2- 2 G's.
3- 3 G's.
4- 4 G's.

583. Refer to the illustration above. If an airplane were flown in a 60° banked turn at a constant altitude, what load factor would result?

017
1- 1 G.
2- 2 G's.
3- 3 G's.
4- 4 G's.

584. If an airplane weighs 2,900 lbs., what air load would result if a load factor of 4.4 were imposed on the airplane's structure?

017
1- 12,760 lbs.
2- 5,800 lbs.
3- 4,350 lbs.
4- 7,860 lbs.

585. "P-factor," which produces a left yawing tendency during certain conditions and flight attitudes, is the result of the

023
1- clockwise rotation of the engine and propeller rolling the airplane counterclockwise.
2- spiral flow of the air as it is forced rearward by the rotating propeller.
3- force applied to the top of the rotating propeller disc acting 90° in advance of the point it was applied.
4- descending propeller blade on the right producing more thrust than the ascending blade on the left.

586. The amount of yawing tendency caused by "P-factor" is dependent on the

023
1- wash-in and washout of the airplane's wingtips.
2- degree to which the vertical fin is offset.
3- rapidity at which the engine power is increased.
4- angle between the propeller shaft and the airplane's climb path.

587. Which statement is true regarding rudder trim adjustments on an airplane with a reciprocating engine?

023
1- If power is decreased and airspeed is constant, apply right rudder trim.
2- If power is constant and airspeed is decreased, apply right rudder trim.
3- If power is increased and airspeed is constant, apply left rudder trim.
4- If power is constant and airspeed is increased, apply right rudder trim.

588. Asymmetrical thrust produced by a propeller during certain flight conditions is the result of the

023
1- rolling motion of the engine caused by air resisting the propeller's rotation.
2- angle of attack on the descending blade being greater than on the ascending blade.
3- spiraling slipstream created by the rotating propeller.
4- gyroscopic precession created by the rotating propeller.

589. Fuel injection systems have certain advantages over float-type carburetor systems. One of these advantages is

P01
1- better flow of fuel.
2- easier starting when the engine is hot.
3- less chance of vapor lock occurring.
4- easier in-flight engine starts.

590. One of the disadvantages of fuel injection systems when compared to float-type carburetors is

P01
1- a slower power response to throttle movement.
2- the uneven distribution of fuel to the cylinders.
3- the possibility of vapor locks during ground operations on hot days.
4- poor control of the fuel/air mixture.

591. If a pilot fails to adjust the fuel/air mixture as altitude is gained, the mixture becomes richer because the

P01
1- density of air entering the carburetor becomes less while the amount of fuel remains the same.
2- volume of air and the amount of fuel entering the carburetor become greater.
3- density of air entering the carburetor becomes greater and the pressure of the fuel becomes less.
4- volume of air entering the carburetor becomes less while the amount of fuel becomes greater.

592. The operating principle of float-type carburetors is based on the

P01
1- automatic metering of air at the venturi as the aircraft gains altitude.
2- difference in air pressure at the venturi throat and the air inlet.
3- increase in air velocity in the throat of a venturi causing an increase in air pressure.
4- measurement of the fuel flow into the induction system.

593. To maintain level cruising flight in an airplane which is loaded with the CG at the forward limit, an additional download must be imposed on the horizontal stabilizer. This in turn produces

018
1- an additional load which the wing must support.
2- a lesser load that must be supported by the wing.
3- a decrease in drag and results in a faster airspeed.
4- a decrease in drag and reduces the stalling speed.

594. When the airplane's main wheels touch the ground during landing, the decelerating force of ground friction creates a nose-down pitching moment. To counteract this moment, tailwheel type airplanes are usually designed to have the CG located

018
1- midway between the main wheels and the tailwheel.
2- slightly aft of the main wheels.
3- directly above the main wheels.
4- well forward of the main wheels.

595. Which factors involved in power-off glide performance will remain unchanged if the airplane's gross weight is increased?

018
1- Maximum glide angle.
2- Maximum glide ratio (L/D).
3- Airspeed for a given glide ratio.
4- Pitch attitude for a given glide ratio.

596. During the takeoff and landing roll in a crosswind, most tailwheel type airplanes have a greater tendency to "weathervane" than nosewheel type airplanes. This is because tailwheel types generally have

018
1- a higher angle of attack on the upwind wing.
2- a greater surface exposed to the wind aft of the pivotal point (main wheels).
3- a greater gyroscopic reaction to the engine rotation.
4- the center of gravity located aft of the pivotal point (main wheels).

597. The indicated airspeed at which an airplane stalls is most affected by the

019
1- density altitude.
2- airplane's loading.
3- airplane's altitude.
4- pressure altitude.

598. Which of these is the sole action that will result in a stall?

019
1- Raising the airplane's nose too high.
2- Exceeding the critical angle of attack.
3- Flying at too low an airspeed.
4- Imposing an insufficient load factor.

599. Which statement is true regarding the use of flaps?

024
1- Conventional airplanes will climb at a faster rate with flaps extended than with flaps retracted.
2- The sudden retraction of flaps will result in little or no loss of altitude if the angle of attack is held constant.
3- The stalling speed with the flaps extended is decreased so the same margin of safety above a stall is provided at a slower approach speed.
4- The primary purpose of flaps is to reduce the approach and landing speed.

600. Which statement is true concerning the performance of slips during a landing approach with flaps extended?

024
1- The rate of sink after removing the slip is greater than it would be without flaps.
2- The indicated airspeed should be less when slipping with flaps.
3- Slipping with flaps should not be attempted because the stall speed is increased significantly.
4- A serious control hazard is created when slipping with flaps.

601. If absolutely necessary to "hand prop" an engine, which of the following is adequate to prevent the airplane from moving forward when the engine starts?

P07
1- Have the passenger hold the brakes ON while operating the throttle.
2- Have a qualified person operate the controls and brakes, or chock the wheels and tie the tail down.
3- Set the throttle to the start position and lock the parking brake ON.
4- Head the airplane into the wind, then set the engine controls to a low power position.

602. Detonation occurs at high power settings when

P08
1- the intake valve opens before the previous charge of fuel has finished burining in the cylinder.
2- the fuel mixture is ignited too early by red-hot carbon deposits in the cylinder.
3- an excessively rich fuel mixture causes extremely slow burning of the fuel.
4- the fuel mixture explodes instead of burning progressively and evenly.

603. Detonation in an aircraft engine is most likely to occur whenever

P08
1- the engine is operated under conditions which cause the fuel mixture to burn instantaneously.
2- the fuel/air ratio is such that the mixture burns extremely slow.
3- one sparkplug misfires under high compression.
4- the fuel being used is of a higher grade than recommended by the engine manufacturer.

604. Completely filling the fuel tanks after the last flight of the day prevents fuel contamination by eliminating the airspace so that

P09
1- rust or corrosive scale cannot form in the tanks.
2- condensation of moist air cannot occur within the tanks.
3- development of micro-organisms is prevented by the fuel.
4- rain, snow, or other moisture cannot accumulate in the tanks.

605. The principal cause of carburetor ice is heat loss in the carburetor caused by

P11
1- water in the fuel.
2- the fuel not being atomized.
3- fuel evaporation and air expansion.
4- air compression in the venturi.

606. In an engine equipped with a float-type carburetor, the low temperature that causes carburetor ice is normally the result of

P11
1- vaporization of fuel and expansion of the air in the carburetor.
2- freezing temperature of the air entering the carburetor.
3- compression of air at the carburetor venturi.
4- low volatility of aviation fuel.

607. Which condition is favorable to the development of induction icing?

P11
1- Any temperature below freezing and a relative humidity of less than 50%.
2- Temperature between 32° F. and 50° F. and a relative humidity less than 50%.
3- Temperatures between 0° F. and 32° F. and a relative humidity between 30% and 50%.
4- Temperatures between 32° F. and 70° F. and a relative humidity greater than 50%.

608. In airplanes that are equipped with constant-speed propellers, carburetor icing would be first indicated by

P11
1- a reduction in engine RPM.
2- a decrease in cylinder head temperature.
3- a reduction in manifold pressure.
4- engine roughness.

609. Wingtip vortices, the dangerous turbulence that might be encountered behind a large airplane, are created only when that airplane is

P12
1- using high-power settings.
2- operating at high airspeeds.
3- heavily loaded.
4- developing lift.

610. Prior to starting the engine the manifold pressure gauge usually indicates approximately 29" Hg. This is because the

P02
1- pointer on the gauge is stuck at the full power indication.
2- throttle is in the full open position.
3- throttle is closed, trapping a high air pressure in the manifold.
4- pressure within the manifold is the same as atmospheric pressure.

611. During which stroke of a reciprocating engine is the gaseous mixture expanding within the cylinder?

P02
1- Intake stroke.
2- Compression stroke.
3- Power stroke.
4- Exhaust stroke.

612. When refueling an airplane, which of the following would be adequate precautions for eliminating the potential hazard of static electricity?

P03
1- Connect a ground wire between the airplane, fuel truck, fuel nozzle, and ground.
2- Strain the fuel through a chamois.
3- Ensure that battery and ignition switches are turned OFF.
4- Connect a ground wire from the truck to the ground.

613. When the pilot leans the mixture control, which of the following is being accomplished?

P04
1- The volume of air entering the carburetor is being reduced.
2- The amount of fuel entering the carburetor is being increased.
3- The volume of air entering the carburetor is being increased.
4- The amount of fuel entering the carburetor is being reduced.

614. Which of these will occur if no leaning is made with the mixture control as the flight altitude increases?

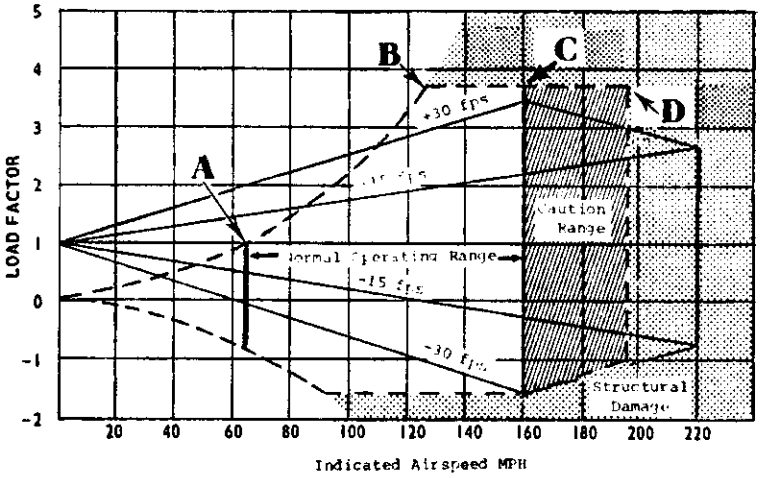
P04
1- The volume of air entering the carburetor remains constant and the amount of fuel decreases.
2- The volume of air entering the carburetor decreases and the amount of fuel decreases.
3- The density of air entering the carburetor decreases and the amount of fuel remains constant.
4- The density of air entering the carburetor decreases and the amount of fuel increases.

615. Which of these is the main reason that fuel tank vents must be open?

P06
1- To allow proper air pressure within the tanks for maintaining a steady fuel flow.
2- To allow fuel fumes to escape from the tanks, thus eliminating the possibility of the tanks exploding.
3- To allow excess fuel to drain overboard when heat expands the volume of fuel within the tanks.
4- To allow air to enter and prevent moisture from condensing and contaminating the fuel within the tanks.

616. When is vapor lock most likely to occur in an airplane's fuel system?

P06
1- During cold, damp days.
2- During ground operations on hot days.
3- When the engine is operated at high power settings.
4- When flying at very high density altitudes.



617. Refer to the Flight Envelope (Vn) above. A positive load factor of 4 at 140 MPH would cause the airplane to

P19
1- climb at a steady rate.
2- be subjected to structural damage.
3- break apart.
4- stall.

618. Refer to the Flight Envelope (Vn) above. What load factor would be created if positive 30 FPS gusts were encountered at 130 MPH?

P19
1- 1.8.
2- 2.0.
3- 3.0.
4- 3.8.

619. Refer to the Flight Envelope (Vn) above. The horizontal dashed line from point B to D represents the

P19
1- maximum structural cruise airspeed range.
2- positive limit load factor.
3- airspeed range for normal operations.
4- ultimate load factor.

620. Refer to the Flight Envelope (Vn) above. The area bounded by points C and D is represented on the airspeed indicator by the

P19
1- green arc.
2- white arc.
3- yellow arc.
4- red line.

621. Refer to the Flight Envelope (Vn) above. The vertical line from point C is represented on the airspeed indicator by the

P19
1- minimum speed limit of the green arc.
2- maximum speed limit of the green arc.
3- maximum speed limit of the yellow arc.
4- maximum speed limit of the white arc.

622. Refer to the Flight Envelope (Vn) above. At what speed would a 2G pullup result in a stall?

P19
1- 62 MPH.
2- 85 MPH.
3- 95 MPH.
4- 130 MPH.

623. Refer to the Flight Envelope (Vn) above. What are the maximum load factors that may be imposed on the airplane without causing structural damage?

P19
1- +2.8 and -1.0.
2- +2.8 and -1.6.
3- +3.8 and -1.6.
4- +4.0 and -2.0.

624. Refer to the Flight Envelope (Vn) above. What is the design maneuvering speed?

P19
1- 160 MPH.
2- 125 MPH.
3- 110 MPH.
4- 80 MPH.

625. Refer to the Flight Envelope (Vn) above. If an upward gust of 30 FPS is encountered at an indicated airspeed of 110 MPH, which statement would be true?

P19
1- The airplane would momentarily stall.
2- The airplane would be severely damaged.
3- The airplane would gain altitude at 1,800 FPM.
4- The maximum load factor would be exceeded.

626. Refer to the Flight Envelope (Vn) above. At an indicated airspeed of 110 MPH, the airplane would first stall if what load factor were imposed?

P19
1- 2 G's.
2- 2.7 G's.
3- 3.8 G's.
4- 4.0 G's.

627. Assume you are landing number 2 following a large transport type airplane. Where should your approach and touchdown be in relation to the transport's?

P12
1- Descend as quickly as possible to penetrate the wingtip vortices and land behind the transport's touchdown point.
2- Remain above the transport's approach path, and touch down beyond the transport's touchdown point if remaining runway is adequate.
3- Fly below the transport's approach path and touch down on the first portion of the runway.
4- Fly on the same approach path as the transport and touch down in the designated touchdown zone.

628. Which statement is true regarding wingtip vortices?

P12
1- Greatest vortex strength is produced when the generating aircraft is heavy, clean, and fast.
2- Trailing vortices tend to move outward and upward from the generating aircraft.
3- When encountering wingtip vortices, the primary hazard is loss of control due to induced roll.
4- Vortices tend to remain level for a period of time before sinking below the generating aircraft's flightpath.

629. To avoid the wingtip vortices of a departing jet during takeoff the pilot should

P12
1- establish a flightpath "downwind" of the vortices.
2- lift off at a point well past the jet aircraft's rotation point.
3- climb above and stay "upwind" of the jet aircraft's flightpath.
4- remain below the flightpath of the jet aircraft.

630. Aircraft magnetos depend upon which of the following for electrical energy?

P16
1- Batteries.
2- Generators.
3- Alternators.
4- Self-contained magnets.

631. Wingtip vortices which trail behind airplanes in flight are caused by the

P12
1- pressure differential existing between the upper and lower surfaces of the wings.
2- axial flow or jetwash from turbine driven airplanes.
3- propwash, or jetwash, depending on the type and speed of the airplane.
4- slipstream or propwash of propeller driven airplanes.

632. Which statement is true concerning the effect of the application of carburetor heat?

P18
1- It reduces the density of air entering the carburetor, thus enriching the fuel-air mixture.
2- It reduces the volume of air entering the carburetor, thus leaning the fuel-air mixture.
3- It reduces the density of air entering the carburetor, thus leaning the fuel-air mixture.
4- It reduces the volume of air entering the carburetor, thus enriching the fuel-air mixture.

633. When operating a high-powered engine, especially one with a supercharger, the use of carburetor heat should be regulated by reference to the

P18
1- manifold pressure or RPM indicator.
2- cylinder head temperature gauge.
3- degree of engine roughness.
4- carburetor air or mixture temperature gauge.

634. If a placard in an airplane states its operational category as "utility," it would mean that the airplane may be operated in which of these manevuers?

P19
1- Limited acrobatics, including spins.
2- Any maneuver except acrobatics or spins.
3- Any maneuver that requires an abrupt change in attitude.
4- All types of acrobatics.

635. Which of the following precautions should be taken in regard to aircraft oxygen equipment?

P22
1- Do not inspect oxygen systems with greasy hands, rags, or tools.
2- Use medical oxygen for replenishing the airplane's oxygen.
3- Prohibit everyone from smoking in an airplane in which an oxygen system is installed.
4- Use only an approved flame dispenser (torch) to check for leaks in the oxygen system.

636. When receiving radar vectors, if an airplane is approaching on a collision course from your left, what action should you take, if any?

P23
1- Expect the other pilot to give way as required by regulations.
2- Wait until ATC issues a new heading or altitude that will ensure adequate separation.
3- Take whatever action is necessary to avoid a collision.
4- Maintain the assigned heading or altitude unless deviation is approved by ATC.

637. If an airplane is using 10.5 gals. of fuel per hour at a cruising altitude of 6,000 feet and the groundspeed is 145 knots, how much fuel is required to travel 460 NM?

Q03
1- 34 gallons.
2- 31 gallons.
3- 29 gallons.
4- 27 gallons.

638. If the airplane is consuming 11.5 gals. of fuel per hour at a cruising altitude of 8,500 feet and the groundspeed is 155 knots, how much fuel is required to travel 445 NM?

Q03
1- 26 gallons.
2- 28 gallons.
3- 30 gallons.
4- 33 gallons.

639. If the airplane is using 12.5 gals. of fuel per hour and the groundspeed is 175 knots, how much fuel is required to travel 580 NM?

Q03
1- 42 gallons.
2- 44 gallons.
3- 46 gallons.
4- 48 gallons.

640. If the airplane is consuming 14.8 gallons of fuel per hour at a cruising altitude of 7,500 feet and the groundspeed is 185 knots, how much fuel is required to travel 600 NM?

Q03
1- 48 gallons.
2- 50 gallons.
3- 53 gallons.
4- 56 gallons.

641. If fuel consumption is 15.3 gals. per hour and groundspeed is 167 knots, how much fuel is required for an airplane to travel 620 NM?

Q03
1- 66 gallons.
2- 63 gallons.
3- 60 gallons.
4- 57 gallons.

642. If the airplane is consuming 80 lbs. of fuel per hour at a cruising altitude of 6,500 feet and the groundspeed is 180 knots, how much fuel is required to travel 610 NM?

Q03
1- 304 lbs.
2- 295 lbs.
3- 285 lbs.
4- 271 lbs.

643. If fuel consumption is 75 lbs. per hour and groundspeed is 177 knots, how much fuel is required for an airplane to travel 455 NM?

Q03
1- 193 lbs.
2- 202 lbs.
3- 212 lbs.
4- 217 lbs.

644. If the airplane is using 91 lbs. of fuel per hour at a cruising altitude of 6,500 feet and the groundspeed is 168 knots, how much fuel is required to travel 457 NM?

Q03
1- 248 lbs.
2- 265 lbs.
3- 291 lbs.
4- 391 lbs.

645. GIVEN:

Pressure altitude . . . . . 3,800 feet
Ambient temperature . . . . 63° F.

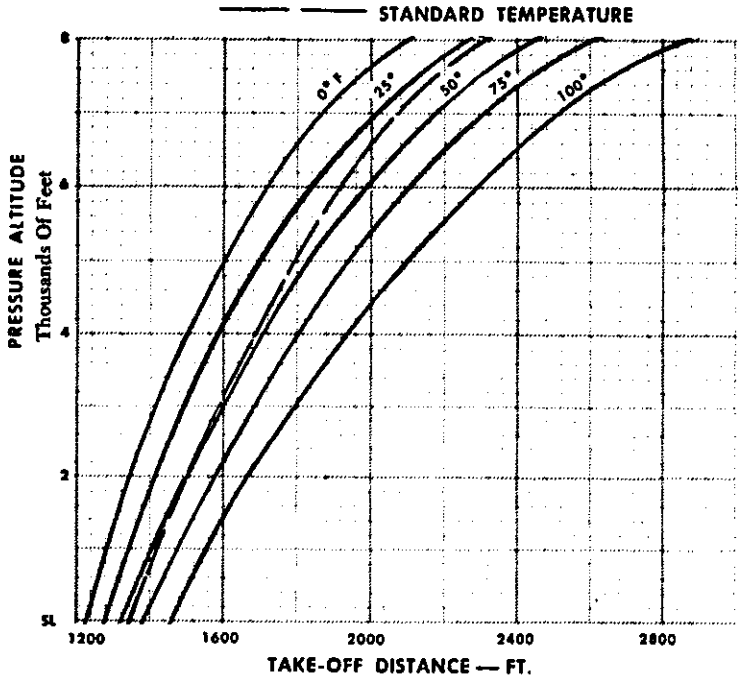
Under these conditions and using the chart on page 105, the distance required to take off and clear a 50-foot obstacle is determined to be

Q01
1- 390 feet.
2- 1,625 feet.
3- 1,725 feet.
4- 1,825 feet.

NORMAL TAKE-OFF

TO CLEAR 50 FEET

ZERO WIND — GROSS WT. = 2900 LB.
PAVED LEVEL RUNWAY



646. Using these and associated conditions in the chart above, determine the distance required to take off and clear a 50-foot obstacle.

Pressure altitude . . . . 1,450 feet
Ambient temperature . . . Standard

The takeoff distance required would be

Q01
1- 1,350 feet.
2- 1,440 feet.
3- 1,550 feet.
4- 1,650 feet.

647. Using these and associated conditions in the chart above, determine the distance required to take off and clear a 50-foot obstacle.

Pressure altitude . . . . 1,950 feet
Ambient temperature . . . 88° F.

The takeoff distance required would be

Q01
1- 1,610 feet.
2- 1,710 feet.
3- 1,810 feet.
4- 1,910 feet.

648. Suppose the following conditions exist:

Pressure altitude . . . . 4,000 feet
Ambient temperature . . . 88° F.

Under these and the associated conditions in the chart above, the takeoff distance required to clear a 50-foot obstacle is

Q01
1- 1,675 feet.
2- 1,875 feet.
3- 1,975 feet.
4- 2,000 feet.

649. Using these and associated conditions in the chart above, determine the distance required to take off and clear a 50-foot obstacle.

Pressure altitude . . . . 1,700 feet
Ambient temperature . . . 75° F.

The takeoff distance required would be

Q01
1- 400 feet.
2- 1,450 feet.
3- 1,550 feet.
4- 1,640 feet.

650. GIVEN:

Pressure altitude . . . . 4,400 feet
Ambient temperature . . . 100° F.

Using these and the associated conditions in the chart above, the distance required to take off and clear a 50-foot obstacle is

Q01
1- 2,075 feet.
2- 2,000 feet.
3- 1,950 feet.
4- 420 feet.

651. GIVEN:

Pressure altitude . . . . 3,500 feet
Ambient temperature . . . 100° F.

Using these and the associated conditions in the chart above, the distance required to take off and clear a 50-foot obstacle is

Q01
1- 1,750 feet.
2- 1,800 feet.
3- 1,850 feet.
4- 1,950 feet.

652. In which airplane category would the limit load factors restrict it to limited acrobatics, including spins?

P19
1- Utility.
2- Normal.
3- Standard.
4- Restricted.

653. Acrobatics, including spins, are prohibited in which aircraft category?

P19
1- Normal.
2- Restricted.
3- Utility.
4- Standard.

654. Limited acrobatics, including spins, are permitted in which aircraft category?

P19
1- Normal.
2- Restricted.
3- Utility.
4- Standard.

655. In airplanes equipped with constant-speed propellers, which procedure should be used to avoid placing undue stress on the engine components?

P20
1- When power is being increased or decreased, the RPM should be adjusted before the manifold pressure.
2- When power is being decreased, reduce the RPM before reducing the manifold pressure.
3- When power is being increased, increase the RPM before increasing the manifold pressure.
4- When power is being increased, increase the manifold pressure before increasing the RPM.

656. During the final approach and landing at a relatively high altitude airport, the pilot should use the same indicated airspeed that is used at a sea level airport. In doing so the

P21
1- groundspeed will be the same and the landing distance will be the same.
2- groundspeed will be higher and the landing distance will be longer.
3- true airspeed will be the same and the landing distance will be the same.
4- true airspeed will be lower and the landing distance will be shorter.

657. When rapid decompression occurs above 30,000 feet in a pressurized airplane, what is the pilot's average time of useful consciousness without oxygen and why?

P21
1- 1 minute because of the "bends."
2- 1/2 second because of severe lung damage.
3- 30 seconds because of hypoxia.
4- 3 minutes because of impaired vision.

658. Aircraft cabin pressurization is used when flying above 28,000 feet primarily to

P21
1- equalize the pressure of gases in the body with that of the environmental gas (air).
2- provide for a pressure-breathing oxygen system.
3- release the nitrogen gas that is dissolved in the blood and move it to various parts of the body.
4- provide humidity and temperature control of the cabin.

659. Which of the following occurs when climbing above 28,000 feet in an unpressurized airplane without supplemental oxygen?

P21
1- The oxygen pressure within the lungs cannot be maintained without an increase in inhaled oxygen pressure.
2- The pressure in the middle ear becomes less than the atmospheric pressure in the cabin.
3- Vision improves significantly as altitude increases because carbon dioxide is released from the body.
4- Gases trapped in the body contract and prevent nitrogen from escaping the blood stream.

660. Why is medical oxygen not recommended for use as supplemental oxygen in airplanes?

P22
1- It is too dry and could cause irritation on the lungs.
2- It contains medicinal properties that may have adverse effects at altitude.
3- It is available in only high pressure cylinders, which are dangerous in airplanes.
4- It may contain moisture which could freeze.

HORSEPOWER SETTING

4000 FEET								6000 FEET		
MP AT 2500 RPM	MP AT 2300 RPM	MP AT 2100 RPM	OAT °F	% BHP	BHP	FUEL FLOW PPH/GPH		MP AT 2500 RPM	MP AT 2300 RPM	MP AT 2100 RPM
22.6	-	-	-20	75	214	92	15.3	22.2	-	-
20.5	22.2	-		65	185	80	13.35	20.2	21.7	-
18.3	19.7	21.4		55	157	69	11.5	18.0	19.4	21.0
16.2	17.3	18.7		45	128	58	9.7	15.9	17.0	18.3
23.0	-	-	0	75	214	92	15.3	22.5	-	-
20.8	22.5	-		65	185	80	13.35	20.5	22.1	-
18.6	20.1	21.8		55	157	69	11.5	18.2	19.7	21.3
16.4	17.5	19.0		45	128	58	9.7	16.2	17.2	18.6
23.4	-	-	+20	75	214	92	15.3	-	-	-
21.2	22.8	-		65	185	80	13.35	20.8	22.4	-
18.8	20.3	22.1		55	157	69	11.5	18.5	20.0	21.7
16.7	17.8	19.2		45	128	58	9.7	16.4	17.5	18.8
23.8	-	-	+40	75	214	92	15.3	23.3	-	-
21.5	23.3	-		65	185	80	13.35	21.1	22.8	-
19.2	20.7	22.5		55	157	69	11.5	18.8	20.3	22.0
16.8	18.0	19.6		45	128	58	9.7	16.6	17.7	19.2
24.2	-	-	+60	75	214	92	15.3	23.7	-	-
21.9	23.7	-		65	185	80	13.35	21.4	23.2	-
19.5	21.0	22.8		55	157	69	11.5	19.1	20.6	22.4
17.1	18.3	19.9		45	128	58	9.7	16.8	18.0	10.5
24.5	-	-	+80	75	214	92	15.3	24.0	-	-
22.2	24.0	-		65	185	80	13.35	21.7	23.5	-
19.8	21.3	21.2		55	157	69	11.5	19.4	20.9	22.7
17.3	18.6	20.2		45	128	58	9.7	17.0	18.2	19.8
24.8	-	-	+100	75	214	92	15.3	-	-	-
22.5	24.3	-		65	185	80	13.35	22.0	23.8	-
20.0	21.5	23.5		55	157	69	11.5	19.6	21.1	23.0
17.5	18.8	20.4		45	128	58	9.7	17.2	18.4	20.0

661. Refer to the chart above. With an OAT of +30° F., what is the maximum attainable manifold pressure at 2500 RPM at an altitude of 6,000 feet?

Q03
1- 15.3" Hg.
2- 22.0" Hg.
3- 22.6" Hg.
4- 24.0" Hg.

662. Refer to the chart above. If 2.5 hours are required to fly 360 NM when using 55% power at 6,000 feet, what would be the groundspeed and amount of fuel consumed?

Q03
1- 144 knots and 24.2 gallons.
2- 144 knots and 28.7 gallons.
3- 144 knots and 38.2 gallons.
4- 150 knots and 26.4 gallons.

663. Refer to the chart above. When using 75% power at a cruising altitude of 5,000 feet with 350 lbs. of fuel aboard, what is the maximum duration of flight?

Q03
1- 3.8 hours.
2- 4.3 hours.
3- 5.0 hours.
4- 6.0 hours.

664. Refer to the chart above. When using 65% power at a cruising altitude of 5,000 feet with a groundspeed of 145 knots, the total amount of fuel required to fly 350 NM would be

Q03
1- 139 lbs.
2- 165 lbs.
3- 193 lbs.
4- 220 lbs.

665. Refer to the chart above. When using 75% power at a cruising altitude of 5,000 feet with a groundspeed of 180 knots, the total amount of fuel required to fly 450 NM would be

Q03
1- 145 lbs.
2- 172.5 lbs.
3- 200 lbs.
4- 230 lbs.

666. Refer to the chart above. When using 55% power at a cruising altitude of 4,000 feet with a groundspeed of 160 knots, what is the maximum distance that can be flown if the flight began with 360 lbs. of fuel?

Q03
1- 626 NM.
2- 720 NM.
3- 834 NM.
4- 993 NM.

667. Refer to the chart above. To fly for 2.8 hours at a cruising altitude of 6,000 feet with only 193 lbs. of fuel available, what is the maximum amount of power that should be used?

Q03
1- 45%.
2- 55%.
3- 65%.
4- 75%.

668. Refer to the chart above. If using 22.5" MP and 2100 RPM at 4,000 feet when ambient temperature is +40° F., what is the maximum duration of flight with 44.0 gallons of fuel available?

Q03
1- 2.8 hours.
2- 3.2 hours.
3- 3.8 hours.
4- 4.5 hours.

669. Use the chart and associated conditions on page 109.

GIVEN:
Temperature (OAT) . . . 90° F.
Pressure altitude . . . 4,000 feet
Takeoff weight . . . . 2,800 lbs.
Headwind . . . . . 20 knots

What is the total takeoff distance required to clear a 50-foot obstacle?

Q01
1- 1,200 feet.
2- 1,500 feet.
3- 1,900 feet.
4- 2,200 feet.

670. Use the chart and associated conditions on page 109.

GIVEN:
Temperature (OAT) . . . 75° F.
Pressure altitude . . . 7,000 feet
Takeoff weight . . . . 2,900 lbs.
Headwind . . . . . 15 knots

What is the approximate ground roll required for takeoff over a 50-foot obstacle?

Q01
1- 1,180 feet.
2- 1,343 feet.
3- 2,000 feet.
4- 2,275 feet.

671. Use the chart and associated conditions on page 109.

GIVEN:
Temperature (OAT) . . . 70° F.
Pressure altitude . . . 6,000 feet
Takeoff weight . . . . 3,000 lbs.
Headwind . . . . . 25 knots

What weight reduction is necessary to take off over a 50-foot obstacle in 1,500 feet?

Q01
1- 275 lbs.
2- 300 lbs.
3- 325 lbs.
4- 350 lbs.

672. Use the chart and associated conditions on page 109.

GIVEN:
Temperature (OAT) . . . 80° F.
Pressure altitude . . . 5,000 feet
Takeoff weight . . . . 2,750 lbs.
Headwind . . . . . 30 knots

What is the total takeoff distance required to clear a 50-foot obstacle?

Q01
1- 1,200 feet.
2- 1,400 feet.
3- 1,650 feet.
4- 2,175 feet.

673. GIVEN:
Temperature (OAT) . . . 85° F.
Pressure altitude . . . 3,000 feet
Takeoff weight . . . . 2,850 lbs.
Headwind . . . . . 20 knots

Using the chart and associated conditions on page 109, determine the total takeoff distance required to clear a 50-foot obstacle.

Q01
1- 1,400 feet.
2- 1,950 feet.
3- 2,050 feet.
4- 2,200 feet.

674. GIVEN:
Temperature (OAT) . . . 90° F.
Pressure altitude . . . 4,000 feet
Takeoff weight . . . . 2,900 lbs.
Headwind . . . . . 15 knots

Using these conditions and the chart on page 109, determine the total takeoff distance required to clear a 50-foot obstacle.

Q01
1- 1,900 feet.
2- 2,100 feet.
3- 2,300 feet.
4- 2,500 feet.

675. GIVEN:
Temperature (OAT) . . . 80° F.
Pressure altitude . . . 5,000 feet
Takeoff weight . . . . 3,400 lbs.
Headwind . . . . . 10 knots

Under the conditions given above and using the chart on page 109, determine the total takeoff distance required to clear a 50-foot obstacle.

Q01
1- 3,300 feet.
2- 3,175 feet.
3- 3,000 feet.
4- 2,875 feet.

676. GIVEN:
Temperature (OAT) . . . 90° F.
Pressure altitude . . . 4,000 feet
Takeoff weight . . . . 3,400 lbs.
Headwind . . . . . 5 knots

Using these conditions and the chart on page 109, determine the GROUND ROLL required to take off and clear a 50-foot obstacle.

Q01
1- 1,230 feet.
2- 1,623 feet.
3- 3,000 feet.
4- 4,770 feet.

NORMAL TAKE-OFF

ASSOCIATED CONDITIONS:

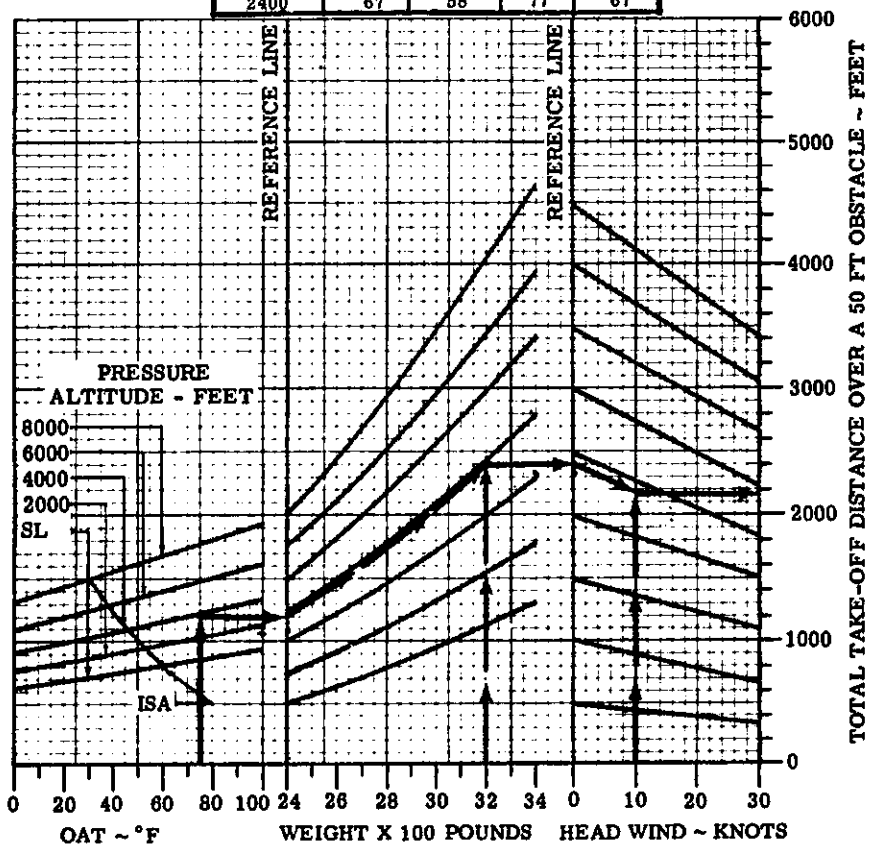
POWER	TAKE-OFF POWER SET BEFORE BRAKE RELEASE
FLAPS	UP
RUNWAY	PAVED, LEVEL, DRY SURFACE
TAKE-OFF SPEED	IAS AS TABULATED

NOTE: GROUND ROLL IS APPROX. 59% OF TOTAL TAKE-OFF DISTANCE OVER A 50 FT OBSTACLE.

EXAMPLE:

OAT	75°F
PRESSURE ALTITUDE	4000 FT
TAKE-OFF WEIGHT	3200 LBS
HEAD WIND	10 KNOTS
TOTAL TAKE-OFF DISTANCE OVER A 50 FT OBSTACLE	2190 FT
GROUND ROLL (59% OF 2190)	1292 FT
IAS TAKE-OFF SPEED	
LIFT-OFF	79 MPH
AT 50 FT	90 MPH

WEIGHT POUNDS	IAS TAKE-OFF SPEED (ASSUMES ZERO INSTR. ERROR)			
	LIFT-OFF		50 FEET	
	MPH	KNOTS	MPH	KNOTS
3400	81	70	92	80
3200	79	69	90	78
3000	76	66	87	76
2800	73	63	84	73
2600	70	61	80	70
2400	67	58	77	67



677. Refer to page 111. If an airplane is at a standard altitude of 5,500 feet and the power is 65%, what is the brake horsepower and true airspeed?

Q03
1- 171 BHP and 184 MPH.
2- 185 BHP and 180 MPH.
3- 185 BHP and 190 MPH.
4- 195 BHP and 185 MPH.

678. Refer to page 111. If an airplane is at a standard altitude of 6,500 feet and the power is 60%, what is the brake horsepower and true airspeed?

Q03
1- 128 BHP and 154 MPH.
2- 171 BHP and 186 MPH.
3- 171 BHP and 187 MPH.
4- 186 BHP and 175 MPH.

679. Refer to page 111. Suppose an airplane is at a standard altitude of 9,500 feet and the power is 70%. What is the brake horsepower and true airspeed?

Q03
1- 128 BHP and 163 MPH.
2- 185 BHP and 185 MPH.
3- 200 BHP and 196 MPH.
4- 214 BHP and 200 MPH.

680. Refer to page 111. Suppose an airplane is at a standard altitude of 10,800 feet and the power is 75%. What is the brake horsepower and true airspeed?

Q03
1- 200 BHP and 164 MPH.
2- 214 BHP and 180 MPH.
3- 214 BHP and 190 MPH.
4- 214 BHP and 198 MPH.

681. Refer to page 111. Suppose full throttle results in an RPM of 2350. If an airplane is at a standard altitude of 3,200 feet, what is the true airspeed?

Q03
1- 180 MPH.
2- 183 MPH.
3- 189 MPH.
4- 194 MPH.

682. Refer to page 111. Suppose an RPM of 2250 is attained at full throttle. What true airspeed and brake horsepower may be expected at a standard altitude of 4,500 feet?

Q03
1- 158 MPH and 171 BHP.
2- 178 MPH and 185 BHP.
3- 179 MPH and 164 BHP.
4- 185 MPH and 178 BHP.

683. Refer to page 111. At 6,000 feet altitude and 55% power, what is the TRUE airspeed?

Q03
1- 169 MPH.
2- 178 MPH.
3- 185 MPH.
4- 210 MPH.

684. Refer to page 111, and determine the TRUE airspeed at 5,000 feet and 2450 RPM.

Q03
1- 183 MPH.
2- 188 MPH.
3- 198 MPH.
4- 207 MPH.

685. Refer to page 111, and determine the TRUE airspeed at 7,400 feet and 55% power.

Q03
1- 162 MPH.
2- 169 MPH.
3- 180 MPH.
4- 210 MPH.

686. Refer to page 111, and determine the true airspeed expected at 8,500 feet using 65% power.

Q03
1- 180 MPH.
2- 186 MPH.
3- 192 MPH.
4- 206 MPH.

687. Refer to page 111. At 200 MPH TAS at 4,800 feet, the brake horsepower would be

Q03
1- 214.
2- 200.
3- 193.
4- 185.

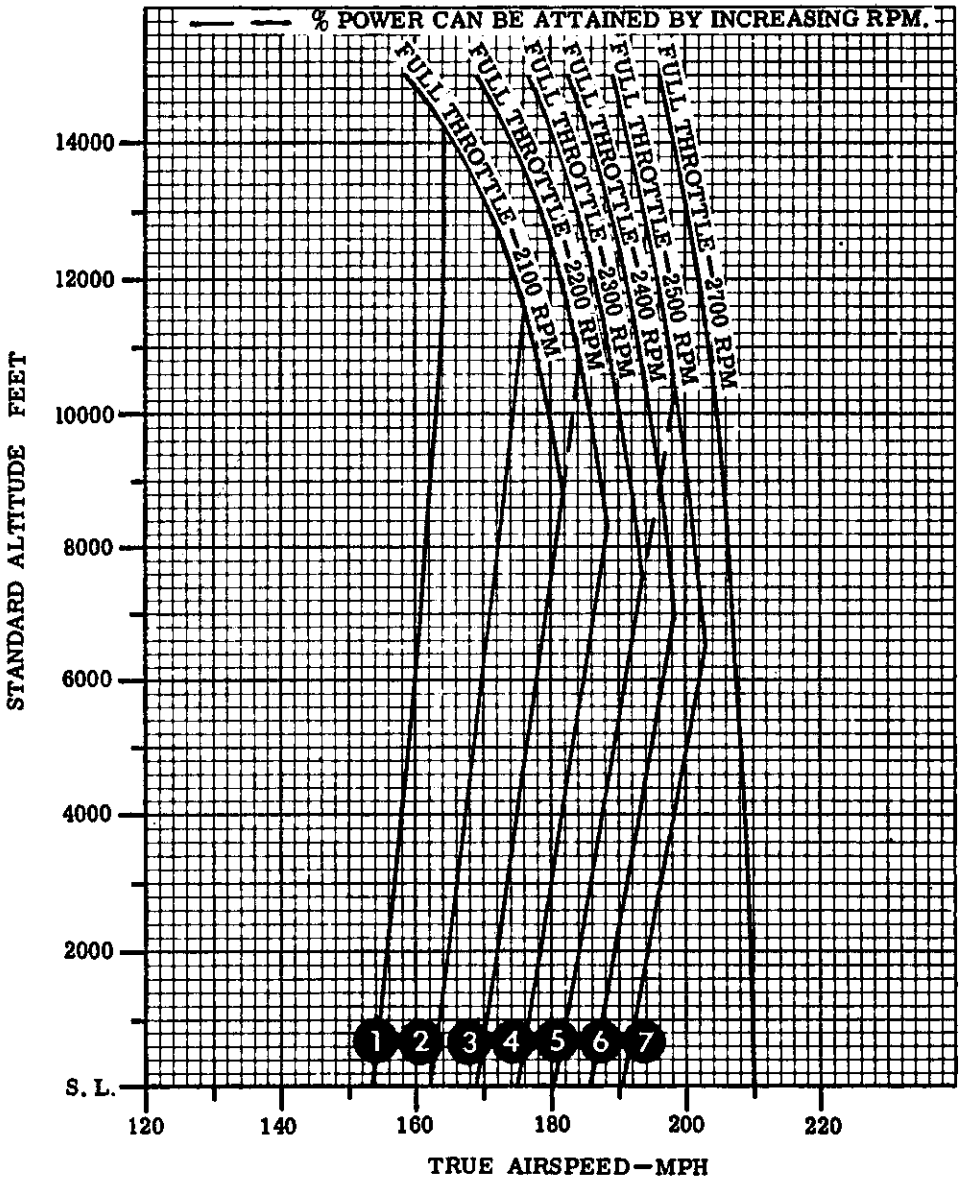
688. Refer to page 111, and determine the horsepower expected at 5,600 feet and 184 MPH TAS.

Q03
1- 171 BHP.
2- 185 BHP.
3- 193 BHP.
4- 200 BHP.

CRUISE OPERATION

WEIGHT 3400 LBS

NO.	% POWER	ENG SPEED RPM	BHP
1	45	2100	128
2	50	2100	142
3	55	2100	157
4	60	2200	171
5	65	2300	185
6	70	2400	200
7	75	2500	214



689. GIVEN:

Fuel quantity . . . . . 55 gals.
Power-cruise (lean) . . . 65%

Using the chart on page 113, how much flight time would be available and still have a 30-minute fuel reserve?

Q03
1- 2 hours 19 minutes.
2- 2 hours 49 minutes.
3- 3 hours 39 minutes.
4- 4 hours 05 minutes.

690. GIVEN:

Fuel quantity . . . . . 48 gals.
Power-cruise (lean) . . . 60%

Use the chart on page 113. How much flight time is available not counting a 30-minute fuel reserve?

Q03
1- 2 hours 12 minutes.
2- 2 hours 32 minutes.
3- 3 hours 22 minutes.
4- 3 hours 52 minutes.

691. Refer to page 113, and determine the amount of fuel consumed during takeoff and climb at 70% power for 10 minutes.

Q03
1- 1.73 gallons.
2- 2.89 gallons.
3- 17.3 gallons.
4- 28.9 gallons.

692. Refer to page 113, and determine the amount of fuel consumed during takeoff and climb using 75% power for 15 minutes.

Q03
1- 3.85 gallons.
2- 4.6 gallons.
3- 38.5 gallons.
4- 46 gallons.

693. Refer to page 113. Cruising (lean) at 60% power (42 gals. total fuel), how much flight time would be available with a 30-minute fuel reserve still remaining?

Q03
1- 2 hours 53 minutes.
2- 3 hours 23 minutes.
3- 3 hours 43 minutes.
4- 5 hours 38 minutes.

694. Refer to page 113. With 56 gals. of fuel aboard and cruising (best power) at 70% power, how much flight time is available with a 30-minute fuel reserve still remaining?

Q03
1- 3 hours 00 minutes.
2- 3 hours 21 minutes.
3- 3 hours 30 minutes.
4- 3 hours 41 minutes.

695, Refer to page 113. With 39 gals. of fuel aboard and cruising (best power) at 65% power, how much flight time is available with a 30-minute fuel reserve still remaining?

Q03
1- 2 hours 06 minutes.
2- 2 hours 36 minutes.
3- 2 hours 45 minutes.
4- 3 hours 05 minutes.

696. Refer to page 113. With 38 gals. of fuel aboard and cruising (lean) at 55% power, the flight time available with a 45-minute reserve still remaining is

Q03
1- 2 hours 33 minutes.
2- 3 hours 18 minutes.
3- 3 hours 38 minutes.
4- 4 hours 03 minutes.

697. Refer to page 113 and determine the brake horsepower and fuel flow during takeoff from an airport with an elevation of 1,500 feet.

Q03
1- 128 BHP and 9.8 GPH.
2- 272 BHP and 23.1 GPH.
3- 284 BHP and 22.8 GPH.
4- 285 BHP and 24.3 GPH.

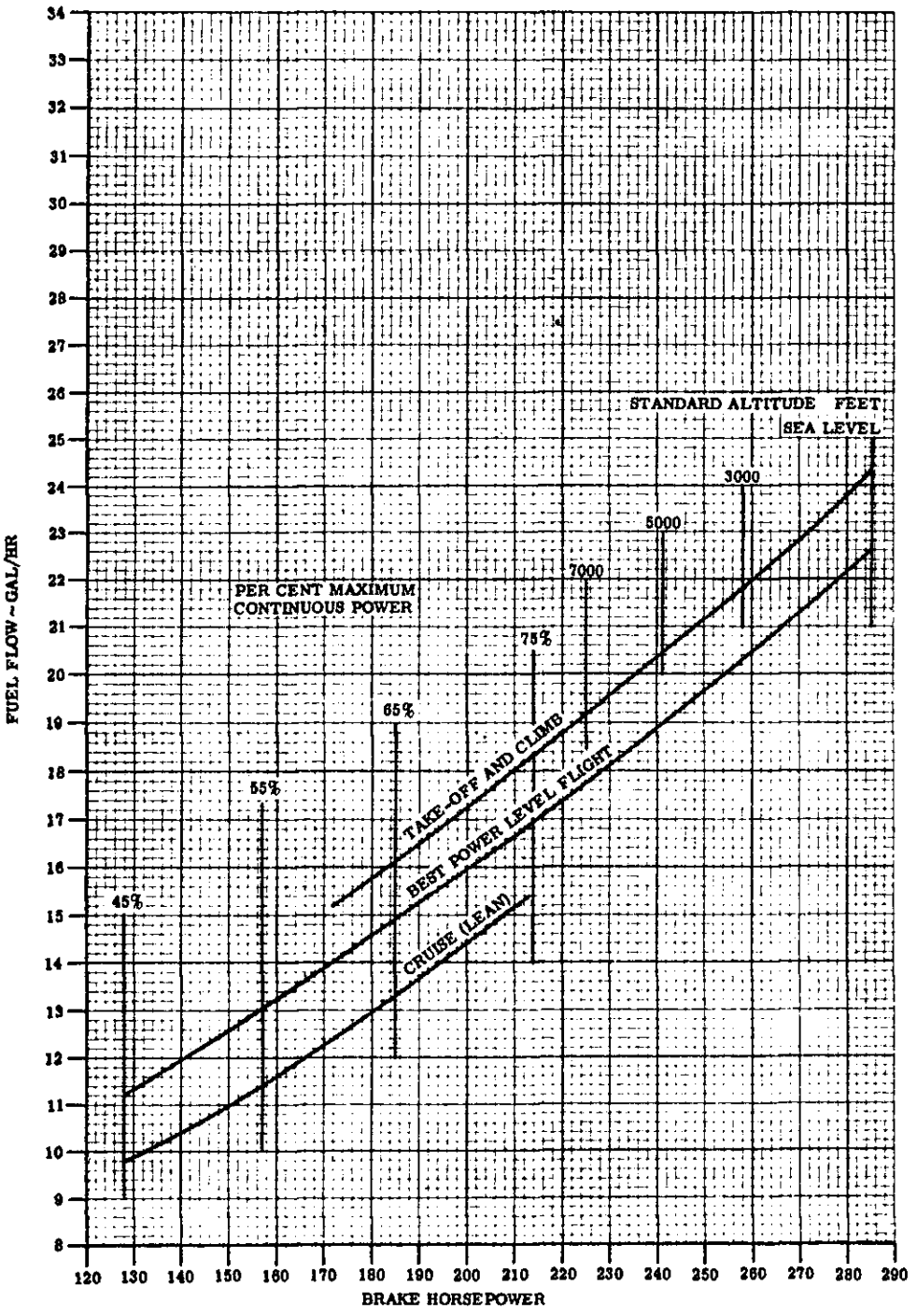
698. Refer to page 113 and determine the fuel flow and brake horsepower expected during takeoff from an airport having an elevation of 2,250 feet.

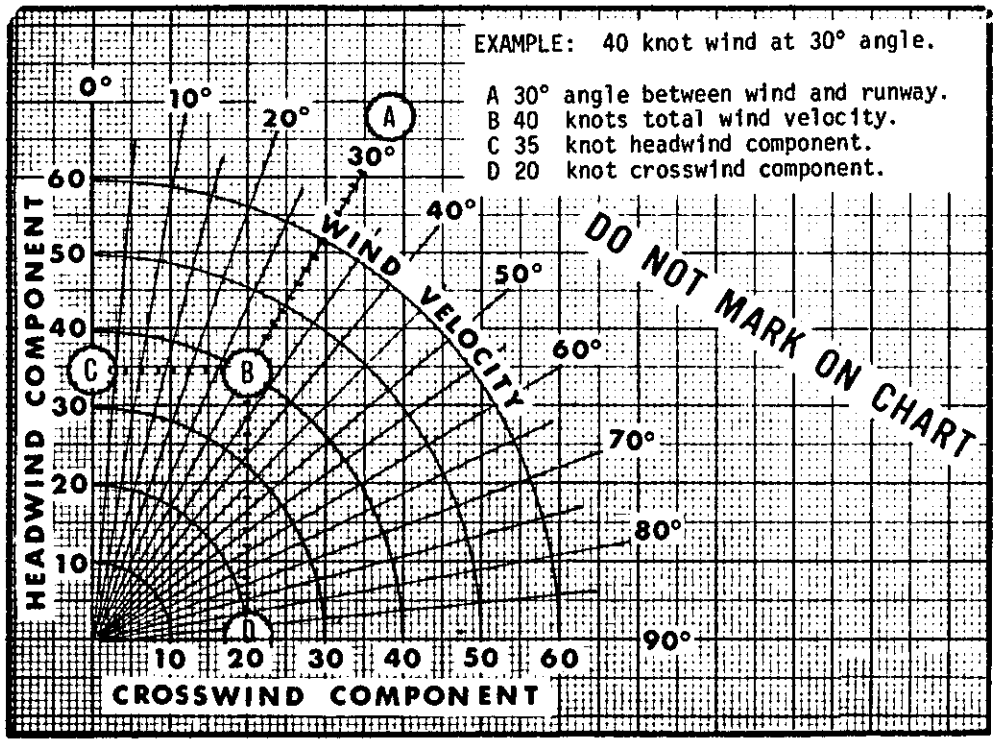
Q03
1- 172 BHP and 15.2 GPH.
2- 265 BHP and 22.4 GPH.
3- 285 BHP and 21.0 GPH.
4- 285 BHP and 24.3 GPH.

FUEL CONSUMPTION VS BRAKE HORSEPOWER

NOTE:

TAKE-OFF AND CLIMB FUEL FLOW PROVIDES ADDITIONAL COOLING IN HIGH AMBIENT TEMPERATURES





699. Refer to the above chart. Suppose the airplane being flown has crosswind capability in direct crosswinds up to 13 knots. Which of these wind conditions would exceed the airplane's crosswind capability?

Q04
1- A crosswind of 15 knots at a 50° angle.
2- A crosswind of 15 knots at a 70° angle.
3- A crosswind of 20 knots at a 40° angle.
4- A crosswind of 30 knots at a 25° angle.

700. Use the above chart and assume Runway 22 is being used for landing. Which surface wind listed below would exceed the airplane's crosswind capability of 0.2 Vso, if Vso is 55 knots?

Q04
1- 190° at 20 knots.
2- 200° at 30 knots.
3- 260° at 15 knots.
4- 270° at 15 knots.

701. Use the above chart and assume Runway 30 is being used for landing. Which surface wind listed below would exceed the airplane's crosswind capability of 0.2 Vso, if Vso is 60 knots?

Q04
1- 260° at 20 knots.
2- 275° at 25 knots.
3- 315° at 35 knots.
4- 320° at 30 knots.

702. Use the chart above and assume Runway 08 is being used for landing. Which surface wind listed below would exceed the airplane's crosswind capability of 0.2 Vso, if Vso is 65 knots?

Q04
1- 030° at 15 knots.
2- 040° at 20 knots.
3- 130° at 15 knots.
4- 145° at 15 knots.

703. Based on the above chart, which of these wind conditions would exceed 0.2 Vso, if Vso of the airplane is 75 knots?

Q04
1- 20 knot wind, 50° to the runway being used.
2- 25 knot wind, 35° to the runway being used.
3- 30 knot wind, 30° to the runway being used.
4- 35 knot wind, 25° to the runway being used.

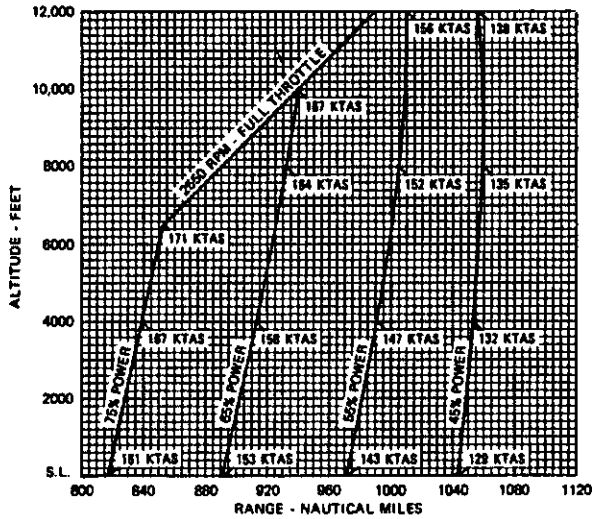
704. Based on the above chart, which of these wind conditions would exceed 0.2 Vso, if Vso of the airplane is 80 knots?

Q04
1- 20 knot wind, 50° to the runway being used.
2- 20 knot wind, 55° to the runway being used.
3- 25 knot wind, 35° to the runway being used.
4- 30 knot wind, 30° to the runway being used.

RANGE PROFILE
45 MINUTES RESERVE
534 LBS. USABLE FUEL

CONDITIONS:
3800 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature
Zero Wind

NOTES:
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the distance during a normal climb
2. Reserve fuel is based on 45 minutes at 45% BHP and is 44 lbs.



705. Use the information on the charts above with these conditions:

Altitude . . . . . 5,500 feet
Power 65%
Headwind component . . 15 knots

The corrected range under the conditions given is

Q03
1- 786 NM.
2- 826 NM.
3- 905 NM.
4- 920 NM.

706. Use the information on the charts above with these conditions:

Altitude . . . . . 6,200 feet
Power 75%
Headwind component . . 20 knots

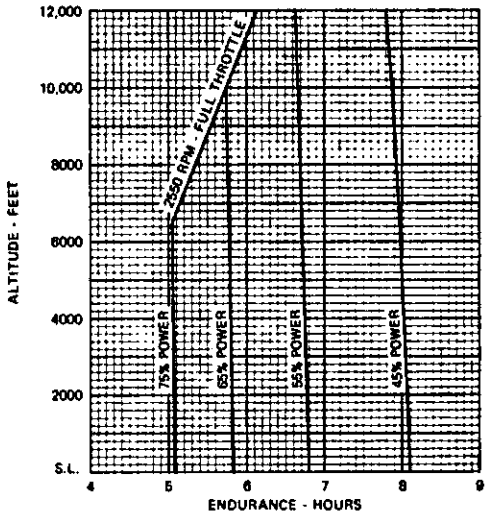
The corrected range under the conditions given is

Q03
1- 765 NM.
2- 800 NM.
3- 850 NM.
4- 870 NM.

ENDURANCE PROFILE
45 MINUTES RESERVE
534 LBS. USABLE FUEL

CONDITIONS:
3800 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature

NOTES:
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the time during a normal climb
2. Reserve fuel is based on 45 minutes at 45% BHP and is 44 lbs.



707. Use the information on the charts above with these conditions:

Altitude . . . . . 4,800 feet
Power 55%
Headwind component . . 25 knots

The corrected range under the conditions given is

Q03
1- 790 NM.
2- 799 NM.
3- 824 NM.
4- 995 NM.

708. Use the information on the charts above with these conditions:

Altitude . . . . . 3,400 feet
Power 65%
Headwind component . . 30 knots

The corrected range under the conditions given is

1- 737 NM.
2- 836 NM.
3- 880 NM.
4- 910 NM.

709. GIVEN:

Ambient temperature . . . 60° F.
Pressure altitude . . . . Sea level
Landing weight . . . . . 2,700 lbs.
Headwind . . . . . 4 knots

Using the chart on page 117, determine the TOTAL LANDING DISTANCE required to land over a 50-foot obstacle.

Q06
1- 522 feet.
2- 650 feet.
3- 950 feet.
4- 1,472 feet.

710. GIVEN:

Ambient temperature . . . 65° F.
Pressure altitude . . . . 2,000 feet
Landing weight . . . . . 2,800 lbs.
Headwind . . . . . 8 knots

Using the chart on page 117, the GROUND ROLL required after a landing over a 50-foot obstacle is determined to be approximately

Q06
1- 438 feet.
2- 537 feet.
3- 975 feet.
4- 1,512 feet.

711. GIVEN:

Ambient temperature . . . 70° F.
Pressure altitude . . . . 4,000 feet
Landing weight . . . . . 2,900 lbs.
Headwind . . . . . 12 knots

Using the chart on page 117, the TOTAL LANDING DISTANCE required to land over a 50-foot obstacle is determined to be

Q06
1- 472 feet.
2- 578 feet.
3- 1,050 feet.
4- 1,628 feet.

712. GIVEN:

Ambient temperature . . . 75° F.
Pressure altitude . . . . 6,000 feet
Landing weight . . . . . 3,000 lbs.
Headwind . . . . . 15 knots

Using the chart on page 117, the GROUND ROLL required after a landing over a 50-foot obstacle is determined to be approximately

Q06
1- 506 feet.
2- 619 feet.
3- 1,125 feet.
4- 1,744 feet.

713. GIVEN:

Ambient temperature . . . 80° F.
Pressure altitude . . . . 5,000 feet
Landing weight . . . . . 3,100 lbs.
Headwind . . . . . 20 knots

Using the chart on page 117, determine the TOTAL LANDING DISTANCE required to land over a 50-foot obstacle.

Q06
1- 492 feet.
2- 558 feet.
3- 1,050 feet.
4- 1,608 feet.

714. GIVEN:

Ambient temperature . . . 85° F.
Pressure altitude . . . . 4,000 feet
Landing weight . . . . . 3,200 lbs.
Headwind . . . . . 25 knots

Using the chart on page 117, the GROUND ROLL required after landing over a 50-foot obstacle is determined to be approximately

Q06
1- 438 feet.
2- 537 feet.
3- 975 feet.
4- 1,512 feet.

715. GIVEN:

Ambient temperature . . . 90° F.
Pressure altitude . . . . 3,000 feet
Landing weight . . . . . 3,300 lbs.
Headwind . . . . . 30 knots

Using the chart on page 117, the TOTAL LANDING DISTANCE required to land over a 50-foot obstacle is determined to be

Q06
1- 427 feet.
2- 523 feet.
3- 950 feet.
4- 1,473 feet.

716. GIVEN:

Ambient temperature . . . 95° F.
Pressure altitude . . . . 2,000 feet
Landing weight . . . . . 3,400 lbs.
Headwind . . . . . Calm

Using the chart on page 117, the GROUND ROLL required after landing over a 50-foot obstacle is determined to be approximately

Q06
1- 585 feet.
2- 715 feet.
3- 1,300 feet.
4- 2,015 feet.

OBSTACLE LANDING

ASSOCIATED CONDITIONS:

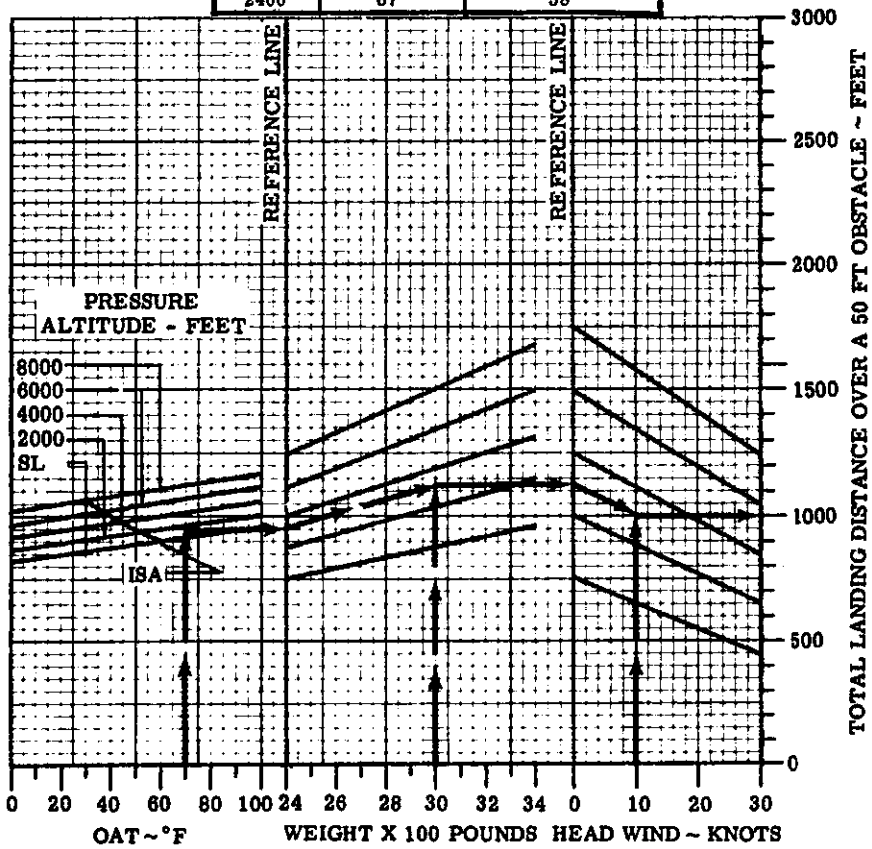
POWER	AS REQUIRED TO MAINTAIN 800 FT/MIN DESCENT ON APPROACH
FLAPS	DOWN
GEAR	DOWN
RUNWAY	PAVED, LEVEL, DRY SURFACE
APPROACH SPEED	IAS AS TABULATED
BRAKING	MAXIMUM

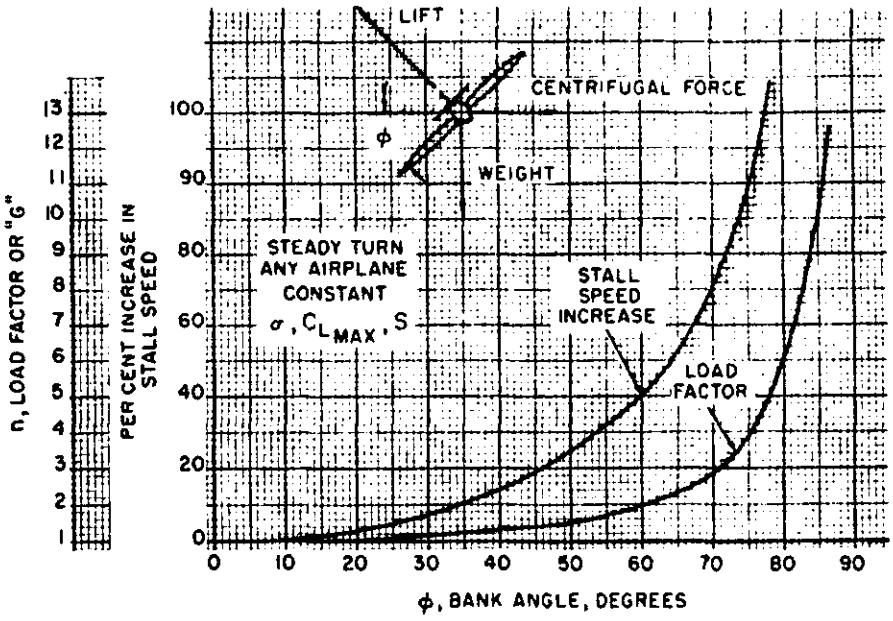
NOTE: GROUND ROLL IS APPROX. 55% OF TOTAL LANDING DISTANCE OVER A 50 FT OBSTACLE.

EXAMPLE:

OAT	70° F.
PRESSURE ALTITUDE	2000 FT
LANDING WEIGHT	3000 LBS
HEAD WIND	10 KNOTS
TOTAL LANDING DISTANCE OVER A 50 FT OBSTACLE	1000 FT
GROUND ROLL (55% OF 1000)	550 FT
IAS APPROACH SPEED	76 MPH

WEIGHT POUNDS	IAS APPROACH SPEED (ASSUMES ZERO INSTR. ERROR)	
	MPH	KNOTS
3400	80	76
3200	78	68
3000	76	66
2800	73	63
2600	70	61
2400	67	58





717. Refer to the chart above. What is the stall speed of an airplane in a steady turn with a load factor of 2 if the unaccelerated stall speed is 70 knots?

Q08
1- 70 knots.
2- 77 knots.
3- 84 knots.
4- 98 knots.

718. Refer to the chart above. At what speed would the airplane stall in a steady turn using a 40° bank if the unaccelerated stall speed is 65 knots?

Q08
1- 68 knots.
2- 71 knots.
3- 75 knots.
4- 78 knots.

719. Refer to the chart above. At what speed would the airplane stall in a steady turn using a 60° bank if the unaccelerated stall speed is 65 knots?

Q08
1- 65 knots.
2- 71 knots.
3- 81 knots.
4- 91 knots.

720. Refer to the chart above. If during a steady turn with a 50° bank a load factor of 1.5 were imposed on an airplane which has an unaccelerated stall speed of 60 knots, at what speed would the airplane first stall?

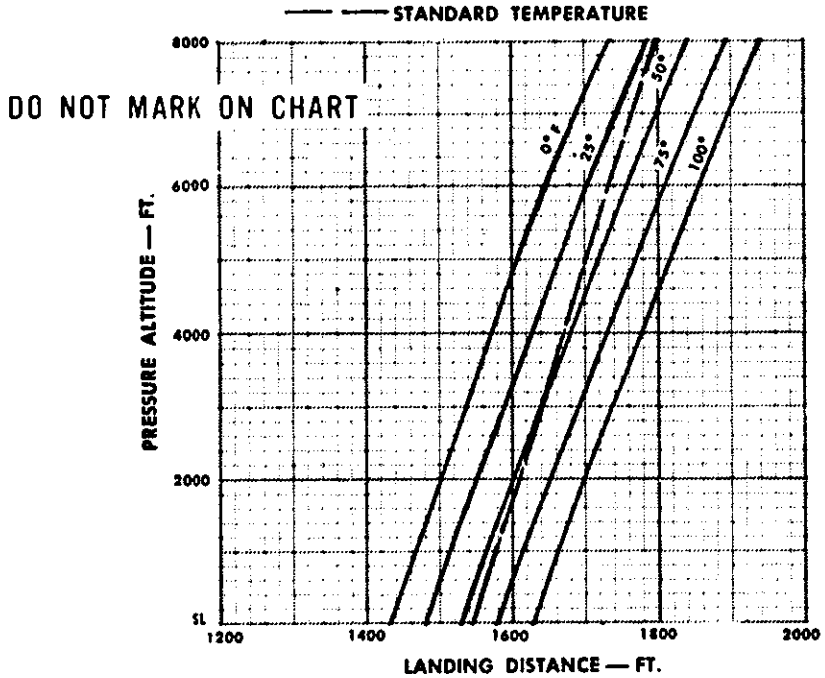
Q08
1- 60 knots.
2- 68 knots.
3- 75 knots.
4- 82 knots.

721. Refer to the chart above. If you were flying in an airplane which has a maximum load factor of 3.8 and an unaccelerated stall speed of 60 knots, which of these events would occur if you rolled into a 60° bank?

Q08
1- The load factor imposed would be 5.0.
2- The maximum load factor would be exceeded.
3- The airplane would stall at 84 knots.
4- The airplane would continue flying at a load factor of 3.8.

NORMAL LANDING

LANDING DISTANCE OVER 50 FT.
POWER OFF APPROACH
FLAPS — 30°, ZERO WIND
GROSS WEIGHT = 2900 LB.
PAVED LEVEL RUNWAY



722. Use the above chart. If the pressure altitude is 4,200 feet and the ambient temperature is standard, the landing distance with the given conditions would be approximately

Q06
1- 1,575 feet.
2- 1,675 feet.
3- 1,750 feet.
4- 1,800 feet.

723. Using the above chart, determine the landing distance under the following conditions:

Pressure altitude . . . 5,800 feet
Ambient temperature . . 100° F.

The landing distance with the given conditions would be approximately

Q06
1- 1,625 feet.
2- 1,700 feet.
3- 1,850 feet.
4- 1,940 feet.

724. Use the above chart. Suppose the ambient temperature is 63° F. and the pressure altitude is 2,800 feet. The landing distance with the given conditions would be approximately

Q06
1- 1,425 feet.
2- 1,560 feet.
3- 1,650 feet.
4- 1,840 feet.

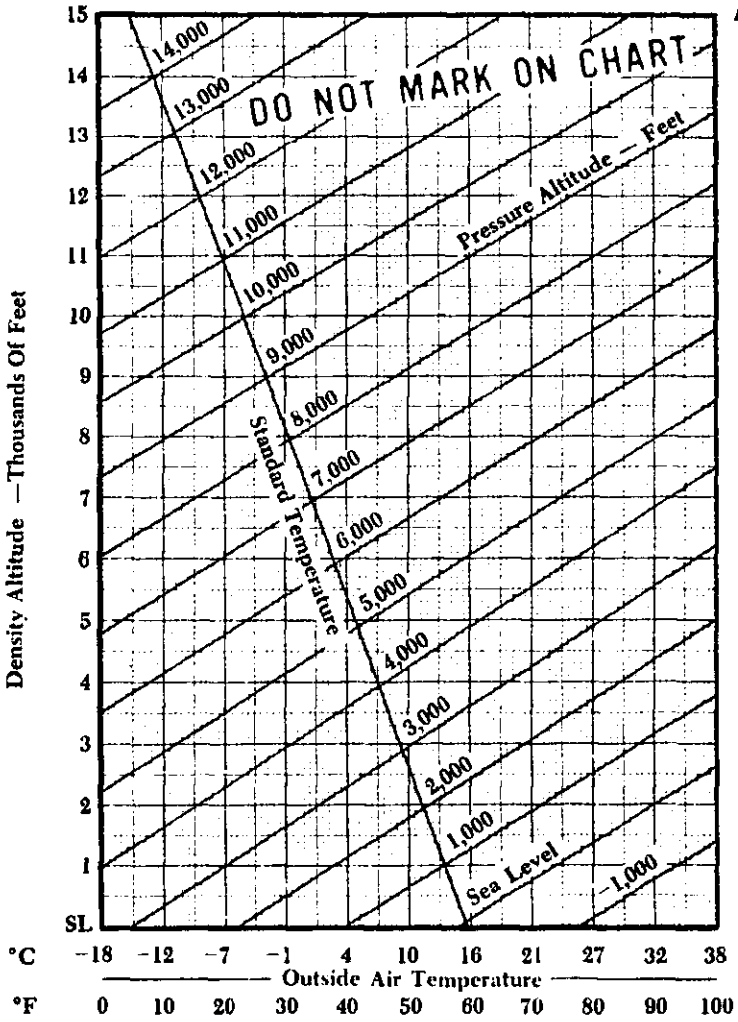
725. Using the above chart, what is the approximate landing distance with the given conditions when the wind is zero, pressure altitude is 3,000 feet, and the temperature is 87° F.?

Q06
1- 1,615 feet.
2- 1,715 feet.
3- 1,755 feet.
4- 1,800 feet.

726. Refer to the above chart. What is the approximate landing distance with the given conditions when the wind is zero, pressure altitude is 3,200 feet, and the temperature is 100° F.?

Q06
1- 1,800 feet.
2- 1,750 feet.
3- 1,710 feet.
4- 1,610 feet.

PRESSURE ALTITUDE AND DENSITY CHART



Altimeter Setting in Hg.	Altitude Addition For Obtaining Pressure Altitude
28.0	1,825
28.1	1,725
28.2	1,630
28.3	1,535
28.4	1,435
28.5	1,340
28.6	1,245
28.7	1,150
28.8	1,050
28.9	955
29.0	865
29.1	770
29.2	675
29.3	580
29.4	485
29.5	390
29.6	300
29.7	205
29.8	110
29.9	20
29.92	0
30.0	-75
30.1	-165
30.2	-257
30.3	-350
30.4	-440
30.5	-530
30.6	-620
30.7	-710
30.8	-805
30.9	-895
31.0	-965

727. Refer to the above chart. When the altimeter setting is 30.10 and the temperature is 100° F. at an elevation of 2,595 feet, the density altitude is approximately

Q12
1- 5,400 feet.
2- 6,100 feet.
3- 3,200 feet.
4- 2,200 feet.

728. Refer to the above chart. If, during takeoff at an airport having an elevation of 2,223 feet, a temperature of 95° F., and an altimeter setting of 28.90, the airplane would perform as though it were at

Q12
1- 6,064 feet MSL.
2- 4,700 feet MSL.
3- 3,200 feet MSL.
4- 2,223 feet MSL.

729. Refer to the above chart. If the ambient temperature and altimeter setting are 95° F. and 29.85, respectively, at an airport having an elevation of 4,695 feet, the density altitude at that airport would be approximately

Q12
1- 4,695 feet.
2- 6,250 feet.
3- 4,760 feet.
4- 7,800 feet.

730. Refer to the above chart. If the ambient temperature and altimeter setting are 75° F. and 29.85, respectively, at an airport having an elevation of 4,695 feet, the density altitude at that airport would be approximately

Q12
1- 1,800 feet.
2- 4,600 feet.
3- 4,760 feet.
4- 6,600 feet.

STALL SPEED CHART
MPH - CAS
4990 POUNDS GROSS WEIGHT

CONFIGURATION	ANGLE OF BANK			
	0°	20°	40°	60°
Gear and Flaps Up	64	67	87	110
Gear Down and Flaps 15°	60	63	93	113
Gear Down and Flaps 45°	76	79	97	106

AIRSPEED CORRECTION TABLE

Flaps 0°		Flaps 15°*		Flaps 45°**	
IAS, MPH	CAS, MPH	IAS, MPH	CAS, MPH	IAS, MPH	CAS, MPH
90	94	70	79	70	76
100	102	80	88	80	84
120	122	90	84	80	83
140	141	100	103	100	102
160	161	110	112	110	111
180	181	120	121	120	120
200	201	130	131	130	129
220	221	140	141	140	138
240	242	150	151		
		160	161		

* Maximum Flap Speed 160 MPH ** Maximum Flap Speed 140 MPH

Note: CAS is identical to TIAS.

731. Refer to the above charts. With the gear down and flaps set at 45°, what would be the indicated stall speed if the angle of bank is 40°?

Q08
1- 80 MPH.
2- 83 MPH.
3- 87 MPH.
4- 90 MPH.

732. Refer to the above charts. With the gear and flaps up, what would be the indicated stall speed, if the angle of bank is 20°?

Q08
1- 70 MPH.
2- 83 MPH.
3- 87 MPH.
4- 102 MPH.

733. Refer to the above charts. Suppose the gear is down and the flaps are set at 15°. If the angle of bank is 0°, what would be the indicated stall speed?

Q08
1- 71 MPH.
2- 80 MPH.
3- 84 MPH.
4- 88 MPH.

734 Refer to the above charts. If the bank angle is 60°, the gear is down, and the flaps are set at 45°, what would be the indicated stall speed?

Q08
1- 84 MPH.
2- 93 MPH.
3- 106 MPH.
4- 110 MPH.

735. Refer to the above charts. What would be the approximate indicated stall speed during a 40° bank with the gear down and flaps set at 15°?

Q08
1- 92 MPH.
2- 90 MPH.
3- 88 MPH.
4- 80 MPH.

736. What is calibrated airspeed?

Q10
1- Indicated airspeed corrected for instrument and installation error.
2- Indicated airspeed corrected for air temperature.
3- Indicated airspeed corrected for pressure altitude.
4- Indicated airspeed corrected for density altitude.

737. Under standard atmospheric conditions, which statement is true regarding pressure altitude (PA) and density altitude (DA)?

Q12
1- PA is equal to DA.
2- PA is lower than DA.
3- PA is greater than DA.
4- PA increases with an increase in pressure, while DA decreases as pressure increases.

738. Of the following factors, which would increase the density altitude of a given airport?

Q12
1- An increase in atmospheric pressure.
2- An increase in air temperature.
3- A decrease in relative humidity.
4- An increase in altimeter setting.

739. Which of these procedures could be used to determine density altitude while on the ground?

Q12
1- Set the altimeter to field elevation and then by means of a density altitude chart apply temperature to the indicated altitude.
2- Set the altimeter to 29.92" Hg and then by means of a computer apply temperature to the indicated altitude.
3- Set the altimeter to the reported altimeter setting and then by means of a density altitude chart apply temperature to the indicated altitude.
4- Set the altimeter to the current altimeter setting and then apply the standard temperature lapse rate to the indicated altitude.

740. Suppose the FSS reports an altimeter setting of 29.25. If the airport elevation is 4,207 feet, the pressure altitude at that airport would be approximately

Q12
1- 3,480 feet.
2- 4,170 feet.
3- 4,830 feet.
4- 7,525 feet.

741. Suppose at an altitude of 7,500 feet MSL, the nearest FSS reports a current altimeter setting of 30.42. The pressure altitude would be approximately

Q12
1- 6,000 feet.
2- 6,500 feet.
3- 7,000 feet.
4- 7,500 feet.

742. Suppose at an altitude of 6,500 feet MSL, the current altimeter setting is 30.42. The pressure altitude would be approximately

Q12
1- 7,000 feet.
2- 7,500 feet.
3- 6,000 feet.
4- 6,500 feet.

743. Suppose the FSS reports an altimeter setting of 29.75. If the airport elevation is 3,657 feet, the pressure altitude would be approximately

Q12
1- 3,480 feet.
2- 3,820 feet.
3- 6,330 feet.
4- 6,670 feet.

744. As the density altitude increases, which of these will occur if the indicated airspeed is maintained constant in a no-wind condition?

Q13
1- True airspeed increases; groundspeed increases.
2- True airspeed increases; groundspeed decreases.
3- True airspeed decreases; groundspeed decreases.
4- True airspeed decreases; groundspeed increases.

745. What is the primary reason for computing density altitude?

Q13
1- To establish flight levels (FLs) above 18,000 feet MSL.
2- To determine aircraft performance.
3- To ensure safe cruising altitude over mountainous terrain.
4- To determine pressure altitude.

746. Which statement is true regarding takeoff performance with high density altitude conditions?

Q13
1- A higher than normal indicated airspeed is required to produce sufficient lift since the air is less dense.
2- The acceleration rate will increase since the lighter air creates less drag.
3- The acceleration rate is slower because the engine and propeller efficiency is reduced.
4- A shorter distance is required to accelerate to lift-off speed due to the reduced drag of the lighter air.

747. Which statement is true regarding the relationship of true airspeed and indicated airspeed as altitude increases?

Q13
1- For a given true airspeed, indicated airspeed decreases.
2- For a given true airspeed, indicated airspeed increases.
3- For a given indicated airspeed, true airspeed decreases.
4- For a given indicated airspeed, true airspeed remains unaffected.

748. Assume that an airplane is flying at a constant indicated altitude and a constant power setting. As a result of an increase in the outside air temperature, the true airspeed will

Q13
1- increase and the true altitude will decrease.
2- increase and the true altitude will increase.
3- decrease and the true altitude will decrease.
4- decrease and the true altitude will increase.

749. For each 1,000-foot increase in altitude, the true airspeed increases approximately

Q13
1- 10% of the indicated airspeed.
2- 2% of the indicated airspeed.
3- 5% of the indicated airspeed.
4- 3.5% of the indicated airspeed.

750. Assume that an airplane is flying at a constant power setting and constant indicated altitude. As a result of a decrease in the outside air temperature, the true airspeed will

Q13
1- decrease and the true altitude will increase.
2- decrease and the true altitude will decrease.
3- increase and the true altitude will increase.
4- increase and the true altitude will decrease.

751. Which statement is true regarding the maximum glide distance for a given airplane in a no-wind condition?

Q14
1- A lighter gross weight requires a slower glide speed.
2- A lighter gross weight requires a faster glide speed.
3- The gross weight has no effect on the proper glide speed.
4- A heavier gross weight will require a decrease in glide speed.

752. The stalling speed of an airplane will be highest when the airplane is loaded with a

Q14
1- high gross weight and aft CG.
2- low gross weight and forward CG.
3- low gross weight and aft CG.
4- high gross weight and forward CG.

753. If the CG of an airplane is moved from the aft limit to beyond the forward limit, how will it affect the cruising speed and the stalling speed?

Q14
1- Increase the cruising speed and decrease the stalling speed.
2- Decrease the cruising speed and increase the stalling speed.
3- Increase both the cruising speed and stalling speed.
4- Decrease both the cruising speed and stalling speed.

754. Which symbol means "maximum flap extended speed"?

Q15
1- Vfe.
2- Vle.
3- Vlof.
4- Vfc.

755. Which of the following airspeeds is identified by color coding on an airspeed indicator?

Q15
1- The maximum gear operating or extended speed.
2- The maximum structural cruising speed.
3- The design maneuvering speed.
4- The stalling speed for all altitudes and configurations.

756. Which symbol designates the airspeed that should not be exceeded after a retractable landing gear is in the down and locked position?

Q15
1- Vfe.
2- Vle.
3- Vlo.
4- Vlof.

757. Which symbol designates the airspeed that should not be exceeded while the retractable landing gear is being extended?

Q15
1- Vfe.
2- Vle.
3- Vlo.
4- Vlof.

758. Which airspeed symbol means "design maneuvering speed"?

Q15
1- Vd.
2- Vc.
3- Vmc.
4- Va.

759. "Maximum landing gear extended speed" is represented by which symbol?

Q15
1- Vlo.
2- Vle.
3- Vlof.
4- Vfe.

760. The symbol which means the stalling speed or the minimum steady flight speed in a specified configuration is

Q15
1- Vso.
2- Va.
3- Vs.
4- Vsl.

761. Operation in excess of an airplane's Vne should be avoided because

Q15
1- flutter or excessive load factors could be induced.
2- excessive induced drag could cause structural failure.
3- control effectiveness would be impaired to the point that the airplane would be uncontrollable.
4- the stalling speed would increase to the point that normal maneuvers could not be performed without stalling.

762. Which statement concerning airplane speed symbols is true?

Q15
1- Vx means the best rate-of-climb speed.
2- Vle means the maximum landing safety speed.
3- Vfe means the maximum flap extended speed.
4- Vso means the power-on stalling speed with the gear and flaps retracted.

763. In regard to the climb angle, the airplane will climb at

Q16
1- a shallower angle while flying downwind than when flying into the wind.
2- the same angle whether flying downwind or upwind.
3- a steeper angle when flying downwind than when flying into the wind.
4- a lesser rate when flying downwind than when flying into the wind.

764. Whenever climbing or descending through an inversion or wind shear zone, the pilot should be alert for which of the following changes in airplane performance?

Q16
1- A sudden loss of airspeed.
2- A fast rate of climb and a slow rate of descent.
3- A sudden surge of thrust.
4- A sudden decrease in power.

765. When turbulence is encountered during the approach to a landing, what action is recommended and for what primary reason?

Q16
1- Increase the airspeed slightly above normal approach speed to prevent a possible stall.
2- Increase the airspeed slightly above normal approach speed to penetrate the turbulence as quickly as possible.
3- Decrease the airspeed slightly below normal approach speed to prevent overshooting the landing area.
4- Decrease the airspeed slightly below normal approach speed to avoid overstressing the airplane.

766. According to the airspeed indicator illustration above, the maximum speed for normal operation is

Q15
1- 150 MPH.
2- 185 MPH.
3- 215 MPH.
4- 250 MPH.

767. Which airspeed on the illustration above represents "Vne"?

Q15
1- 150 MPH.
2- 210 MPH.
3- 215 MPH.
4- 272 MPH.

768. Which statement is true regarding the airspeed indicator illustration above?

Q15
1- Maneuvering speed is <u>not</u> marked on the face of the instrument.
2- Best angle-of-climb speed is represented by the blue line (110 MPH).
3- Maximum landing gear operating speed is represented by the "top" of the white arc (210 MPH).
4- Maximum structural cruising speed is represented by the "top" of the yellow arc (272 MPH).

769. Refer to the airspeed illustration above. "Vfe" is represented by which airspeed?

Q15
1- 50 MPH.
2- 80 MPH.
3- 150 MPH.
4- 215 MPH.

770. Refer to the airspeed illustration above. "Vsl" is represented by which airspeed?

Q15
1- 70 MPH.
2- 80 MPH.
3- 85 MPH.
4- 110 MPH.

771. Refer to the airspeed illustration above. "Vso" is represented by which airspeed?

Q15
1- 50 MPH.
2- 70 MPH.
3- 85 MPH.
4- 110 MPH.

772. Suppose while flying in a steady wind of 25 knots, the airplane is turned from a direct headwind to a direct tailwind. The indicated airspeed would

Q16
1- remain the same but the groundspeed would increase 50 knots.
2- increase 25 knots and the groundspeed would increase 25 knots.
3- decrease 25 knots and the groundspeed would increase 25 knots.
4- increase 50 knots and the groundspeed would increase 25 knots.

773. During a level turn, increasing the airspeed while maintaining a constant load factor would result in

Q17
1- an increase in the radius of turn.
2- a decrease in radius of turn.
3- the same radius of turn.
4- an increase in centrifugal force.

774. Using the chart on page 127, what indicated airspeed would result in the greatest increase in altitude in a minimum amount of time at 7,400 feet?

Q21
1- 93 MPH.
2- 96 MPH.
3- 108 MPH.
4- 115 MPH.

775. Using the chart on page 127, what indicated airspeed would result in the greatest increase in altitude in a unit of time at 9,800 feet?

Q21
1- 93 MPH.
2- 96 MPH.
3- 107 MPH.
4- 115 MPH.

776. Using the chart on page 127, the indicated airspeed that would give the greatest gain in altitude in a unit of time at 3,200 feet is determined to be

Q21
1- 93 MPH.
2- 94 MPH.
3- 113 MPH.
4- 115 MPH.

777. Using the chart on page 127, determine the indicated airspeed that would result in the greatest increase in altitude in a unit of time at 8,800 feet?

Q21
1- 93 MPH.
2- 96 MPH.
3- 108 MPH.
4- 115 MPH.

778. Refer to the chart on page 127. What indicated airspeed would result in the greatest increase in altitude for a given distance at 5,600 feet?

Q21
1- 93 MPH.
2- 95 MPH.
3- 111 MPH.
4- 115 MPH.

779. Refer to page 127. What indicated airspeed at 6,200 feet would result in the greatest increase in altitude for a given distance?

Q21
1- 93 MPH.
2- 95 MPH.
3- 110 MPH.
4- 115 MPH.

780. Refer to page 127. What indicated airspeed at 3,800 feet would result in the greatest increase in altitude for a given distance?

Q21
1- 94 MPH.
2- 113 MPH.
3- 117 MPH.
4- 122 MPH.

781. Refer to page 127. What indicated airspeed at 3,000 feet would result in the greatest increase in altitude for a given distance?

Q21
1- 94 MPH.
2- 113 MPH.
3- 115 MPH.
4- 119 MPH.

782. Refer to the chart on page 127. To maintain the best rate-of-climb, the indicated speed for best rate should be

Q21
1- reduced approximately .8 MPH per 1,000 feet of altitude.
2- increased at least 1 MPH per 1,000 feet of altitude.
3- maintained at a constant value during the climb.
4- adjusted to maintain the specified rate of climb.

783. Refer to the chart on page 127. During a climb under the given conditions, an indicated airspeed of 95 MPH at 6,000 feet will provide the

Q21
1- greatest gain of altitude in a one-minute period.
2- greatest gain of altitude for each mile of forward travel.
3- fastest gain of altitude in a given time period.
4- steepest climb angle from that altitude upward.

784. Suppose the nosewheel of an airplane moves forward upon gear retraction. Would this forward movement affect the CG location of that airplane?

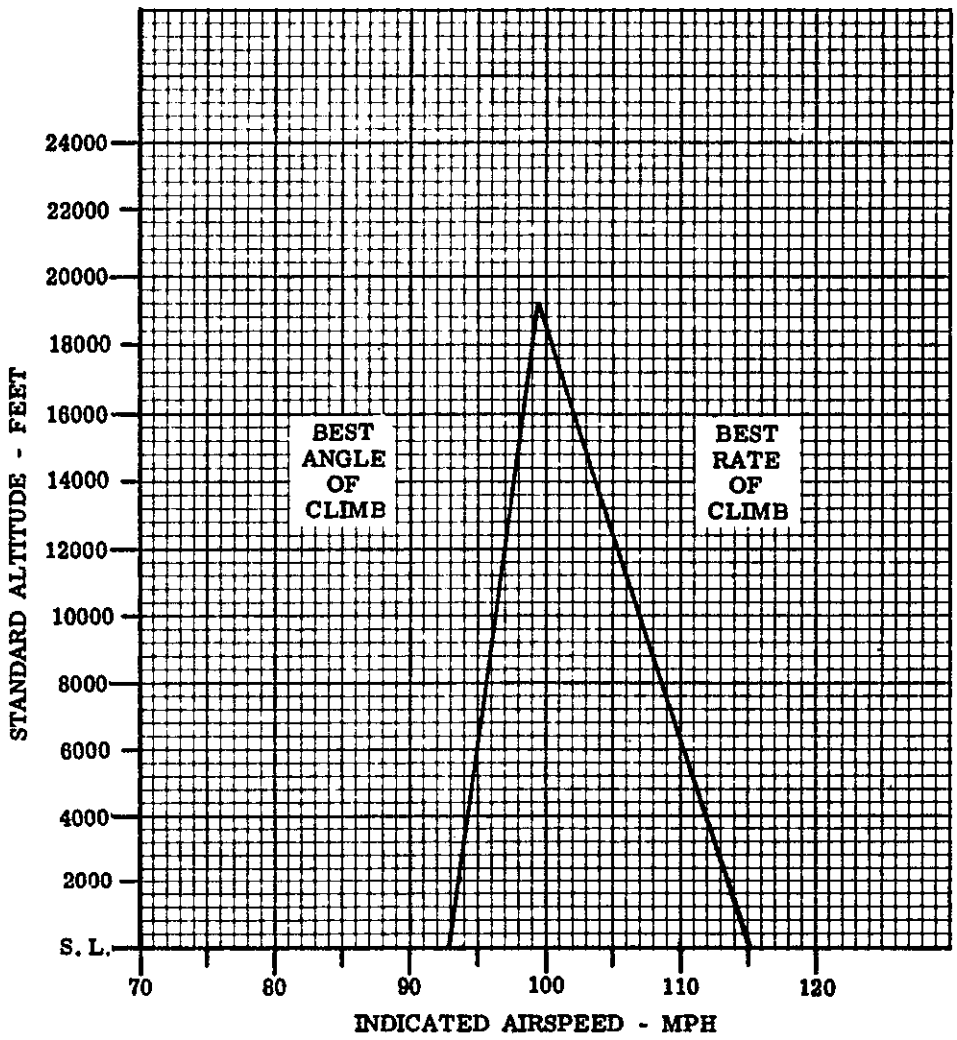
Q23
1- Yes; the CG would move aft.
2- Yes, but the CG movement would be unpredictable.
3- No; the CG would not move.
4- Yes; the CG would move forward.

MAXIMUM CLIMB

CLIMB SPEED

ASSOCIATED CONDITIONS:

POWER	MAXIMUM CONTINUOUS
WEIGHT	3400 POUNDS
GEAR	UP
FLAPS	UP



785. Assume this load:

Front seat - pilot & passenger . 340 lbs.
Rear seat - (fwd position)
- passengers . . . . 370 lbs.
Baggage . . . . . 130 lbs.
Fuel . . . . . 80 gals.

Using the data on page 129, the airplane is determined to be

Q23
1- 7 lbs. over allowable gross weight; the CG is located at 86.15" aft of datum.
2- 30 lbs. over allowable gross weight; the CG is located aft of the aft limit.
3- 53 lbs. over allowable gross weight; the CG is located aft of the aft limit.
4- 456 lbs. under allowable gross weight; the CG is located within limits.

786. Assume this load:

Front seat - pilot & passenger . 400 lbs.
Rear seat - (aft position)
- passengers . . . . 240 lbs.
Baggage . . . . . 20 lbs.
Fuel . . . . . 75 gals.

Using the data on page 129, the airplane is determined to be

Q23
1- 157 lbs. under allowable gross weight, but the CG is located aft of the aft limit.
2- 157 lbs. under allowable gross weight; the CG is located within limits.
3- 180 lbs. under allowable gross weight; the CG is located within limits.
4- 180 lbs. under allowable gross weight, but the CG is located aft of the aft limit.

787. Assume this load:

Front seat - pilot & passenger . 375 lbs.
Rear seat - (aft position)
- passengers . . . . 245 lbs.
Baggage . . . . . 65 lbs.
Fuel . . . . . 70 gals.

Using the data on page 129, the airplane is determined to be

Q23
1- 185 lbs. under allowable gross weight; the CG is located within limits.
2- 162 lbs. under allowable gross weight; the CG is located within limits.
3- 162 lbs. under allowable gross weight; the CG is located aft of aft limit.
4- 692 lbs. under allowable gross weight; the CG is located within limits.

788. Assume the following load:

Front seat - pilot . . . . . 155 lbs.
- passenger . . . . . 150 lbs.
Rear seat - (fwd position)
- 1st person . . . . 175 lbs.
- 2nd person . . . . 180 lbs.
Baggage . . . . . 120 lbs.
Fuel . . . . . 80 gals.

Using the data on page 129, the airplane is determined to be

Q23
1- 7 lbs. under allowable gross weight; the CG is located forward of the forward limit.
2- 20 lbs. under allowable gross weight; the CG is located within limits.
3- 30 lbs. under allowable gross weight; the CG is located aft of the aft limit.
4- 490 lbs. under allowable gross weight; the CG is located within limits.

789. Suppose the nosewheel of an airplane moves aft during gear retraction. How would this aft movement affect the CG location of that airplane?

Q23
1- It would have no effect on the CG location.
2- It would cause the CG location to move aft.
3- It would cause the CG location to move forward.
4- It would cause the CG location to move, but the direction of movement would be unpredictable.

790. GIVEN:

Total weight . . . . 4,385 lbs.
CG location . . . . Station 90.0

If 115 lbs. were added at Station 115.0, where would the new CG be located?

Q23
1- Station 89.4.
2- Station 90.6.
3- Station 95.8.
4- Station 108.7.

791. The center of gravity of an airplane can be determined by which of the following methods?

Q23
1- Multiplying total weight by total moments.
2- Dividing total arms by total moments.
3- Dividing total moments by total weight.
4- Multiplying total arms by total weight.

USEFUL LOAD WEIGHTS AND MOMENTS

FUEL LEADING EDGE TANKS ARM 75					
Gallons	Weight	Moment	Gallons	Weight	Moment
5	30	23	45	270	203
10	60	45	49	294	221
15	90	68	55	330	248
20	120	90	60	360	270
25	150	113	65	390	293
30	180	135	70	420	315
35	210	158	75	450	338
40	240	180	80	480	360

OCCUPANTS				
Front Seats ARM 85		Rear Seats		
			Fwd. Position ARM 121	Aft Position ARM 136
Weight	Moment	Weight	Moment	Moment
120	102	120	145	163
130	111	130	157	177
140	119	140	169	190
150	128	150	182	204
160	136	160	194	218
170	145	170	206	231
180	153	180	218	245
190	162	190	230	258
200	170	200	242	273

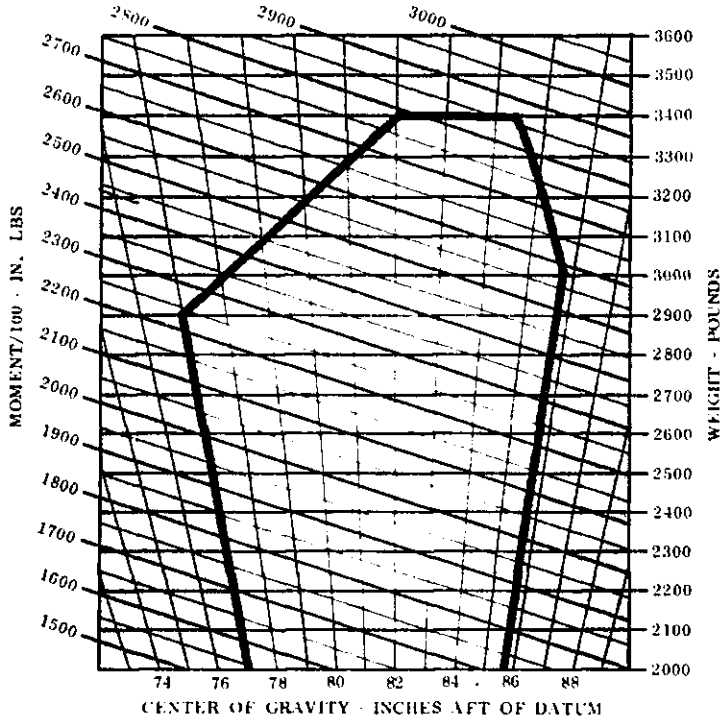
OIL ARM 25		
Quarts	Weight	Moment
12	23	6

BAGGAGE ARM 150	
Weight	Moment
10	15
20	30
30	45
40	60
50	75
60	90
70	105
80	120
90	135
100	150
110	165
120	180
130	195
140	210
150	225
160	240
170	255
180	270
190	285
200	300
210	315
220	330
230	345
240	360
250	375
260	390
270	405

EMPTY WEIGHT DATA		
*Oil is included in empty weight	Empty Weight (Lbs.)	Empty Weight Moment (/100)
Certificated Weight	2110	1652

NOTE: All moments are equal to $\frac{\text{weight X arm}}{100}$

GROSS WEIGHT MOMENT LIMITS



792. GIVEN: (Use charts on page 131.)

Empty weight . . . . . 2,340 lbs.
(oil is included)
Empty weight moment . . . 92.5 lb.-in.
Pilot & front seat
passenger . . . . . 390 lbs.
Center passengers . . . . 260 lbs.
Aft passengers . . . . . 240 lbs.
Baggage . . . . . 110 lbs.
Fuel . . . . . 85 gals.

If the airplane were loaded before take-off as shown above, what would the total weight and moment be after 65 gallons of fuel are consumed during flight?

Q23
1- 3,445 lbs. and 182.2 lb.-in.
2- 3,445 lbs. and 187.3 lb.-in.
3- 3,475 lbs. and 170.2 lb.-in.
4- 3,460 lbs. and 170.4 lb.-in.

793. GIVEN:

Empty weight . . . . . 2,276.0 lbs.
(oil is included)
Empty weight moment . . . 90.2 lb.-in.
Pilot & front seat
passenger . . . . . 400 lbs.
Center passengers . . . . 200 lbs.
Aft passengers . . . . . 175 lbs.
Baggage . . . . . 35 lbs.
Fuel . . . . . 80 gals.

If the airplane were loaded before take-off as shown above, what would the total weight and moment be after 70.0 gallons of fuel have been used during flight (use the charts on page 131)?

Q23
1- 3,131 lbs. and 144.5 lb.-in.
2- 3,146 lbs. and 144.7 lb.-in.
3- 3,566 lbs. and 162.7 lb.-in.
4- 3,986 lbs. and 180.7 lb.-in.

794. GIVEN:

Empty weight . . . . . 2,340 lbs.
(oil is included)
Empty weight moment . . . 92.5 lb.-in.
Pilot & front seat
passenger . . . . . 400 lbs.
Fuel . . . . . 89 gals.

Use the charts on page 131. Will the CG remain within limits after 79 gallons of fuel have been used in flight?

Q23
1- Yes, but the CG will be located in the shaded area of the CG envelope.
2- Yes, the CG will remain within limits.
3- No, the CG will be located aft of the aft CG limit.
4- No, the CG will be located forward of the forward CG limit.

795. GIVEN:

Empty weight . . . . . 2,260.0 lbs.
(oil is included)
Empty weight moment . . . 93.2 lb.-in.
Pilot & front seat
passenger . . . . . 400 lbs.
Center passengers . . . . 400 lbs.
Aft passengers . . . . . 340 lbs.
Baggage . . . . . 120 lbs.
Fuel . . . . . 89 gals.

Use the charts on page 131. Is the airplane loaded within limits?

Q23
1- No, the weight exceeds the maximum allowable by 254 lbs., and the CG is aft of the aft limit.
2- No, the weight is acceptable, but the CG is aft of the aft limit.
3- Yes, the weight and CG would be within limits after 254 lbs. of fuel were consumed.
4- Yes, the weight and CG location is acceptable.

796. GIVEN:

Empty weight . . . . . 2,260.0 lbs.
(oil is included)
Empty weight moment . . . 93.2 lb.-in.
Pilot & front seat
passenger . . . . . 380.0 lbs.
Center passengers . . . . 240.0 lbs.
Aft passengers . . . . . 220.0 lbs.
Baggage . . . . . 120 lbs.
Fuel . . . . . 75 gals.

Under the conditions listed above and using the charts on page 131, the center of gravity is determined to be located

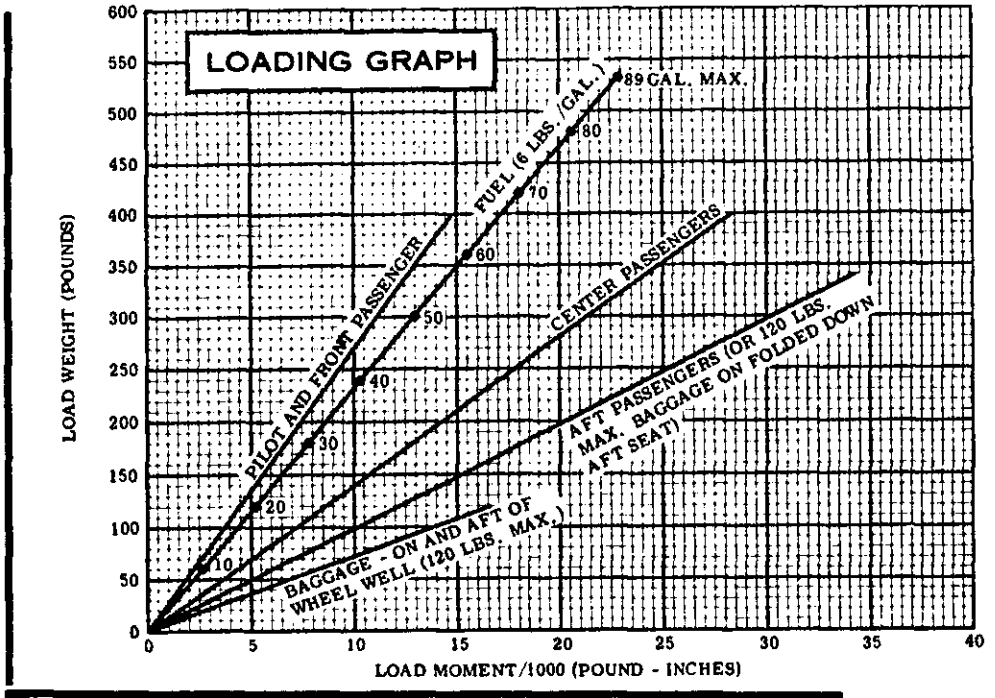
Q23
1- within the CG envelope.
2- on the forward limit of the CG envelope.
3- on the aft limit of the CG envelope.
4- within the shaded area of the CG envelope.

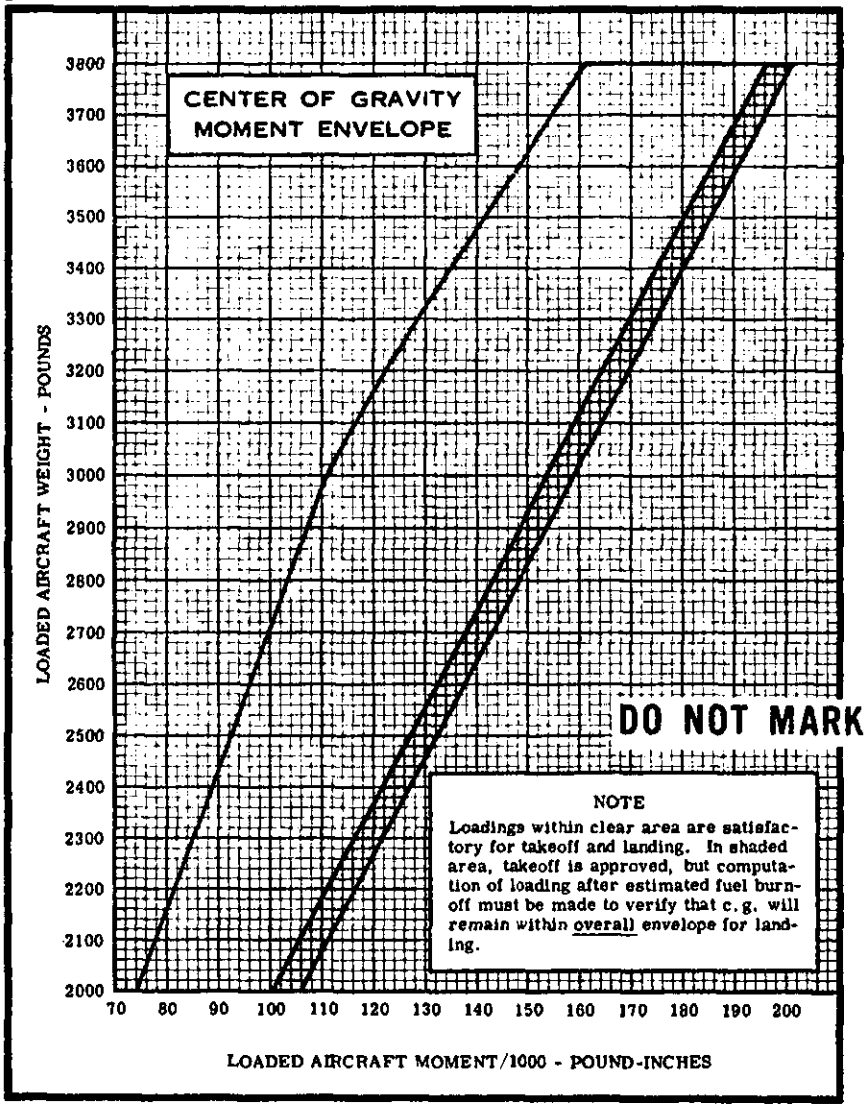
797. GIVEN:

Empty weight . . . . . 2,276.0 lbs.
(oil is included)
Empty weight moment . . . 90.2 lb.-in.
Pilot & front seat
passenger . . . . . 400 lbs.
Center passengers . . . . 200 lbs.
Fuel . . . . . 89 gals.

Using the charts on page 131, determine the total weight and moment after 79 gallons of fuel have been used during flight.

Q23
1- 2,936 lbs. and 121.9 lb.-in.
2- 3,395 lbs. and 142.1 lb.-in.
3- 3,410 lbs. and 142.3 lb.-in.
4- 3,884 lbs. and 162.7 lb.-in.





DO NOT MARK ON CHARTS

CLIMB SPEEDS

Cruising Climb Speed—Normal rate of power, full throttle with Gear and Flaps Up . . . . . 130 mph

At 5000 ft. Altitude	GEAR & FLAP UP	GEAR DOWN	GEAR & FLAP DOWN
Best rate of climb speed	102 mph	86 mph	67 mph
Best angle of climb speed	84 mph	75 mph	64 mph

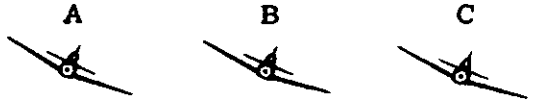
STALL SPEEDS

CONFIGURATION	ANGLE OF BANK 0°	20°	40°	60°
Gear and Flaps Up Power Off	71.0 mph	73.2 mph	81.1 mph	100.4 mph
Gear and Flaps Up Power On	63.0 mph	65.0 mph	72.0 mph	89.2 mph
Gear and Flaps Down Power Off	60.0 mph	61.9 mph	68.6 mph	84.9 mph
Gear and Flaps Down Power On	54.0 mph	55.7 mph	61.7 mph	76.5 mph

798. Suppose the airplane's maximum glide ratio in calm air is obtained at an airspeed of 80 knots. To obtain the maximum glide when flying into a 40 knot headwind, it would be best to

Q16
1- use an airspeed less than 80 knots.
2- maintain an airspeed greater than 80 knots.
3- glide at 80 knots in spite of the wind.
4- extend 10° of flaps and increase the airspeed.

799. Note the angle of bank and airspeed of the airplanes illustrated and compare the turn rates and radii.



Bank 20° TAS 100 knots | Bank 20° TAS 150 knots | Bank 20° TAS 200 knots

Which statement is true?

Q17
1- "A" has the fastest turn rate and "C" has the greatest turn radius.
2- All airplanes are turning at the same rate, but "C" has the greatest turn radius.
3- "A" has the slowest turn rate and "C" has the smallest turn radius.
4- "A" has the slowest turn rate but all are turning in the same radius.

800. Refer to the illustration above. If "Vx" is maintained during a straight climb with gear and flaps down, how much margin of safety will there be above stalling speed?

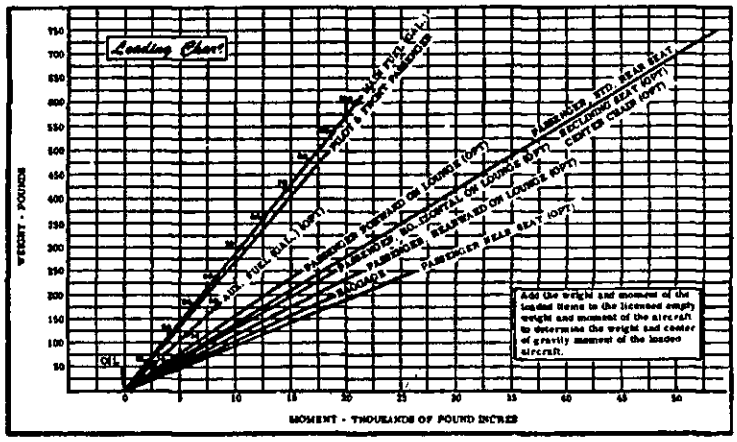
Q20
1- 5 MPH.
2- 10 MPH.
3- 15 MPH.
4- 20 MPH.

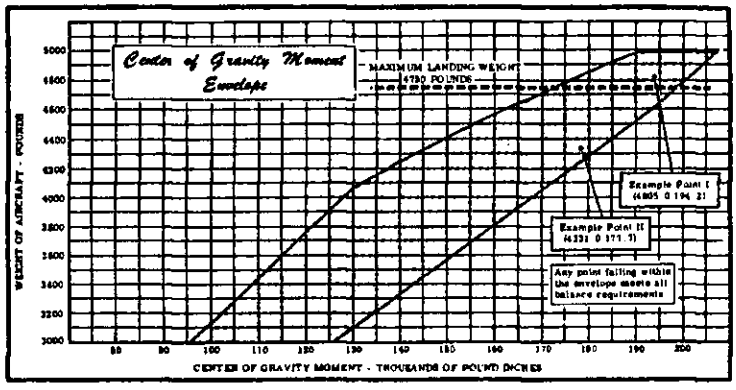
801. Using the above information, determine the airspeed that is recommended by FAA when none is specified by the airplane manufacturer for a short field approach. The proper approach speed is

Q20
1- 55-59 MPH.
2- 64-68 MPH.
3- 70-74 MPH.
4- 78-84 MPH.

802. As altitude increases, the IAS at which a given airplane stalls in a particular configuration will

Q19
1- increase because the air density becomes less.
2- remain the same as at low altitude.
3- decrease as the TAS decreases.
4- decrease as the TAS increases.





803. GIVEN:

Airplane empty weight (oil not included in empty weight)	3,130 lbs.
Empty weight moment	106.7 (in. lbs./ 1000)
Front seat	410 lbs.
Fuel (main tanks)	100 gals.
Fuel (auxiliary tanks)	30 gals.
Oil	6 gals.

Based on this information and using the above charts, the CG is determined to be located

Q23
1- well forward of the forward CG limit; the weight should be adjusted as necessary prior to flight.
2- near the aft CG limit; the weight should be adjusted as necessary prior to flight.
3- well aft of the aft CG limit; the weight should be adjusted as necessary prior to flight.
4- within the CG envelope; no weight adjustment is necessary.

804. GIVEN:

Airplane empty weight (oil not included in empty weight)	3,065 lbs.
Empty weight moment	117.0 (in.lbs./ 1000)
Front seat	410 lbs.
Rear seat (std)	400 lbs.
Fuel (main tanks)	100 gals.
Fuel (auxiliary tanks))	30 gals.
Oil	6 gals.
Baggage	200 lbs.

Based on this information and using the above charts, the CG is determined to be located

Q23
1- well forward of the forward CG limit; the weight should be adjusted as necessary prior to flight.
2- near the aft CG limit; the weight should be adjusted as necessary prior to flight.
3- outside the CG limit; the weight should be adjusted as necessary prior to flight.
4- within the CG envelope; no weight adjustment is necessary.

805. GIVEN:

Total weight . . . . . 4,750 lbs.
CG location . . . . . Station 115.8
Aft CG limit . . . . . Station 118.0

Could 100 lbs. of baggage be shifted from Station 30.0 to Station 120.0 without exceeding the aft CG limit?

Q23
1- Yes, the CG would remain at Station 117.69.
2- Yes, the new CG would be located at Station 117.69.
3- No, the new CG would be located at Station 118.15.
4- No, the new CG would be located at Station 118.25.

806. GIVEN:

Total weight . . . . . 3,650 lbs.
CG location . . . . . Station 87.5
Forward CG limit . . . Station 85.5

Could you shift 50 lbs. of baggage from Station 120.0 to Station 30.0 without exceeding the forward CG limit?

Q23
1- No, the new CG location would be at Station 85.41.
2- No, the new CG location would be at Station 86.1.
3- Yes, the new CG location would be at Station 86.26.
4- Yes, the CG location would remain at Station 87.5.

807. GIVEN:

Total weight . . . . . 2,800 lbs.
CG location . . . . . Station 120.0
Forward CG limit . . . Station 117.0

Could 100 lbs. of baggage be shifted from Station 130.0 to Station 30.0 without exceeding the forward CG limit?

Q23
1- No, the new CG would be located at Station 116.42.
2- No, the new CG would be located at Station 116.89.
3- Yes, the new CG would be located at Station 117.89.
4- Yes, the CG would remain at Station 120.0.

808. GIVEN:

Total weight . . . . . 3,650 lbs.
CG location . . . . . Station 84.5
Aft CG limit . . . . . Station 85.0

The maximum weight that could be added at Station 115.0 without exceeding the aft CG limit would be

Q23
1- 60 lbs.
2- 65 lbs.
3- 71 lbs.
4- 75 lbs.

809. GIVEN:

Aircraft total weight . 7,500 lbs.
CG location . . . . . Station 80.5
Aft CG limit . . . . . Station 79.5

How much cargo (weight) must be shifted from the aft cargo compartment at Station 150.0 to the forward cargo compartment at Station 30.0 to move the CG to exactly the aft CG limit?

Q23
1- 62.5 lbs.
2- 65.8 lbs.
3- 68.9 lbs.
4- 73.5 lbs.

810. GIVEN:

Total weight . . . . . 4,037 lbs.
CG location . . . . . Station 67.8
Fuel consumption . . . 14.7 GPH
Fuel CG . . . . . Station 68.0

After 1 hour 45 minutes of flight time, the CG would be located at Station

Q23
1- 67.79.
2- 68.79.
3- 69.78.
4- 70.78.

811. Suppose a flight is made from an area of high pressure into an area of lower pressure without the altimeter setting being adjusted. If a constant indicated altitude is maintained, the altimeter would indicate

R04
1- lower than the actual altitude above sea level.
2- higher than the actual altitude above sea level.
3- the actual altitude above ground level.
4- the actual altitude above sea level.

812. GIVEN:

Weight "A" - 120 lbs. @ 15" aft of datum
Weight "B" - 200 lbs. @ 117" aft of datum
Weight "C" - 75 lbs. @ 195" aft of datum

Based on this information, the center of gravity would be located how far aft of datum?

Q23
1- 82".
2- 109.0".
3- 121.7".
4- 100.8".

813. GIVEN:

Weight "D" - 160 lbs. @ 45" aft of datum
Weight "E" - 170 lbs. @ 145" aft of datum
Weight "F" - 105 lbs. @ 185" aft of datum

Based on this information, where would the center of gravity be located?

Q23
1- .86" aft of datum.
2- 117.8" aft of datum.
3- 125.0" aft of datum.
4- 136.7" aft of datum.

814. GIVEN:

Weight "X" - 130 lbs. @ 17" aft of datum
Weight "Y" - 110 lbs. @ 110" aft of datum
Weight "Z" - 75 lbs. @ 210" aft of datum

Based on this information, the center of gravity would be located how far aft of datum?

Q23
1- 89.1".
2- 95.4".
3- 106.9".
4- 112.3".

815. GIVEN:

Total weight . . . . . 4,950 lbs.
CG location . . . . . Station 88.5
Aft CG limit . . . . . Station 90.0

The maximum weight that could be added to Station 128.0 without exceeding the aft CG limit would be

Q23
1- 187 lbs.
2- 195 lbs.
3- 200 lbs.
4- 211 lbs.

816. GIVEN:

Total weight . . . . . 4,700 lbs.
CG location . . . . . Station 95.0

If 75 lbs. were added at Station 115.0, the new CG would be located at Station

Q23
1- 95.31.
2- 105.81.
3- 115.44.
4- 214.88.

817. GIVEN:

Total weight . . . . . 9,135 lbs.
CG location . . . . . Station 110.0

If 165 lbs. were added at Station 137.5, the new CG would be located at Station

Q23
1- 110.48.
2- 123.75.
3- 137.76.
4- 147.57.

818. GIVEN:

Total weight . . . . . 2,942 lbs.
Center of gravity . . 29.75" aft of datum

If 58 lbs. of baggage were added at 99.75" aft of datum, the new CG would be located at

Q23
1- 23.16" aft of datum.
2- 28.40" aft of datum.
3- 31.10" aft of datum.
4- 57.85" aft of datum.

819. GIVEN:

Total weight . . . . . 2,850 lbs.
CG location . . . . . Station 77.3
Forward CG limit . . . Station 75.0

How much weight could be added at Station 25.0 without exceeding the forward CG limit?

Q23
1- 131 lbs.
2- 143 lbs.
3- 155 lbs.
4- 174 lbs.

820. GIVEN:

Total weight . . . . . 6,100 lbs.
CG location . . . . . Station 96.0
Forward CG limit . . . Station 94.0

The maximum weight that could be added to Station 30.0 without exceeding the forward CG limit would be

Q23
1- 136 lbs.
2- 177 lbs.
3- 190 lbs.
4- 205 lbs.

821. GIVEN:

Total weight . . . . . 3,350 lbs.
CG location . . . . . Station 88.0

If 120 lbs. were added at Station 120.0, where would the new CG be located?

Q23
1- Station 80.80.
2- Station 86.90.
3- Station 89.10.
4- Station 104.00.

822. Which of the following is the cause of Northerly Turning Error in a conventional magnetic compass?

R09
1- The vertical component of the earth's magnetic field.
2- The balancing weights on one end of the steel magnetic needles.
3- Centrifugal force that is created during a turn.
4- Centripetal force that is created during a turn.

823. Deviation error of the magnetic compass is caused by

R09
1- certain metals and electrical systems within the airplane.
2- the difference in location of true north and magnetic north.
3- acceleration and deceleration.
4- magnetic dip.

824. To appreciate the significance of pressure altitude, it must be understood that it is

R11
1- the height above a standard datum plane.
2- the height above sea level.
3- the height above the terrain.
4- the elevation of an airport.

825. If the altimeter indicates 1,380 feet when set to 29.92, what is the pressure altitude?

R11
1- 1,280 feet.
2- 1,380 feet.
3- 1,480 feet.
4- 1,580 feet.

826. The pressure altitude at a given location is indicated by the altimeter after it is set to

R11
1- the field elevation.
2- the density altitude.
3- 29.92.
4- the current altimeter setting.

827. The design maneuvering speed of an airplane should be explained as that at which

U04
1- turbulence will cause structural damage to the airplane.
2- unanticipated stalls, resulting from gusts, will be averted.
3- an airplane should be maneuvered in the traffic pattern.
4- full, sudden deflection of the flight controls will not cause structural damage.

828. At or below what speed will the airplane stall before the maximum load factor is exceeded?

U04
1- maximum structural cruise speed.
2- maximum flaps extended speed.
3- design maneuvering speed.
4- never exceed speed.

829. If severe turbulence is encountered during flight, the pilot should reduce the airspeed to

U04
1- design maneuvering speed.
2- minimum control speed.
3- never exceed speed.
4- maximum structural cruising speed.

830. Generally, when severe turbulence is encountered the airspeed should be reduced to or slightly below the design maneuvering speed, because at that speed the

U04
1- effectiveness of the controls is increased.
2- airplane will stall before an excessive load factor occurs.
3- margin of safety above stall speed is increased.
4- angle of the relative wind resulting from vertical gusts will be less and thus prevent a stall.

831. In the event severe turbulence is encountered in flight, the airplane should be slowed to which of these airspeeds?

U04
1- Va.
2- Vfe.
3- Vle.
4- Vsl.

841. To obtain best efficiency on constant-speed propellers, which of the following would be an appropriate setting for the given airspeeds?

U08
1- A high pitch setting when at slow airspeeds.
2- A low RPM setting when at high airspeeds.
3- A high RPM setting when at slow airspeeds.
4- A low pitch setting when at high airspeeds.

842. What is the primary advantage of a constant-speed propeller?

U08
1- To obtain a pitch setting that is suitable for each flight situation and power setting.
2- To maintain a specific engine speed.
3- To control the power output developed by the engine.
4- To obtain and maintain a selected pitch angle of the blades regardless of the flight situation or power setting.

843. Which one of the following would result in increased efficiency for a controllable propeller?

U08
1- Increasing propeller pitch with no increase in engine power.
2- Decreasing propeller pitch with no increase in engine power.
3- Increasing propeller pitch and increasing engine power.
4- Decreasing propeller pitch and increasing engine power.

844. During climb after takeoff in an airplane equipped with a constant-speed propeller, the power output of the engine should be reduced to climb power by decreasing manifold pressure and

U08
1- increasing the RPM by increasing the propeller blade angle.
2- decreasing the RPM by increasing the propeller blade angle.
3- increasing the RPM by decreasing the propeller blade angle.
4- decreasing the RPM by decreasing the propeller blade angle.

845. When the throttle is advanced during cruise on an airplane that is equipped with a constant-speed propeller, the propeller pitch angle automatically

U08
1- increases; the engine RPM remains the same.
2- increases; the engine RPM also increases.
3- decreases; the engine RPM remains the same.
4- decreases; the engine RPM increases.

846. During cruising flight, when the throttle setting is decreased on an airplane equipped with a constant-speed propeller, the propeller pitch automatically

U08
1- increases and the RPM increases.
2- decreases and the RPM remains the same.
3- increases and the RPM remains the same.
4- decreases and the RPM decreases.

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832. Which statement is true regarding the effect of temperature changes on the indications of a sensitive altimeter?

R04
1- Colder-than-standard temperatures will place the airplane lower than the altimeter indicates.
2- Warmer-than-standard temperatures will place the airplane lower than the altimeter indicates.
3- Colder-than-standard temperatures will place the airplane higher than the altimeter indicates.
4- Temperature changes, unlike pressure changes, have no effect on the altimeter indications.

833. The reported altimeter setting of a given station is the

R04
1- actual barometric pressure measured at the station.
2- actual barometric pressure measured at sea level.
3- station's barometric pressure converted to mean sea level pressure.
4- station's pressure altitude adjusted for existing temperature.

834. The different colored radials and arcs on an airspeed indicator represent

R06
1- indicated or true airspeeds.
2- equivalent airspeeds.
3- true airspeeds.
4- calibrated or indicated airspeeds.

835. Which instrument would be affected by excessively low pressure in the airplane's vacuum system?

R08
1- Vertical velocity indicator.
2- Airspeed indicator.
3- Pressure altimeter.
4- Heading indicator.

836. If the pitot head were clogged or iced over and the power and pitch were held constant, the indicated airspeed would

R08
1- increase as altitude is increased.
2- decrease as altitude is increased.
3- increase as altitude is decreased.
4- be unaffected by altitude changes.

837. A possible result of using the emergency alternate source of static pressure in an unpressurized airplane is that the

R08
1- altimeter may indicate an altitude lower than the actual altitude being flown.
2- vertical velocity indicator may indicate a continuous descent.
3- altimeter may indicate an altitude higher than the actual altitude being flown.
4- airspeed indicator may indicate less than normal.

838. If the ram air and the drain hole of the pitot system becomes blocked, trapping the pressure in the system, the indicated airspeed will generally

R08
1- vary excessively during level flight when the actual airspeed is changed.
2- decrease during climbs.
3- remain unchanged during level flight, even if the actual airspeed is varied by large power changes.
4- increase during descents.

839. Which statement is true about magnetic deviation of a compass?

R09
1- Deviation is the same for all airplanes in the same locality.
2- Deviation is different on various headings of a given airplane.
3- Deviation is the same for all airplanes on various headings.
4- Deviation is different in a given airplane in different localities.

840. Which of the following statements is true regarding a magnetic compass?

R09
1- Compass deviation is the angular difference between true north and magnetic north.
2- Magnetic variation is the deflection of the compass needles which is caused by magnetic attractions in the airplane.
3- Magnetic dip increases with an increase in latitude.
4- The direction of turn error is the same anywhere in the world.