AC 61-75A

FLIGHT INSTRUCTOR - GLIDER

Written Test Guide

REVISED
1980

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

PREFACE

This written test guide was prepared by the Office of Flight Operations of the Federal Aviation Administration to help applicants meet the knowledge requirements for the Flight Instructor Certificate with a Glider Rating. It supersedes AC 61-75, Flight Instructor--Glider--Written Test Guide, dated 1974.

This guide briefly explains the need for comprehensive instruction and describes the knowledge requirements for certification as a glider 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 the instructions for taking the official FAA written test, as well as test items representative of those used in the glider flight instructor written tests. 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.

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.

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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 piloting 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 substitutes 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 a glider flight instructor certificate, a person must hold a commercial pilot certificate with a glider 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 Glider 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 glider pilot certificate. To ensure that adequate knowledge of those subjects has been acquird, the instructor applicant must pass the FAA's Flight Instructor--Glider--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--Glider--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 written tests were passed.

Written tests are administered by FAA General Aviation District Offices, Flight Standards District Offices, and certain Air Carrier District Offices. In addition, officially designated individuals have been given the authority to administer certain FAA written tests. The practical test can be administered by an FAA Inspector or a designated Flight Instructor Examiner (FIE) with Glider Authorization.

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--Glider--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--Glider--Written Test include all subjects in which ground instruction is required for private and commercial glider pilot ratings.

The test items deal with specific subjects such as basic navigation, radio navigation, radio communications, meteorology, aerodynamics, glider performance, Federal Aviation Regulations, and glider 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.

Sample test items representative of those in the Flight Instructor--Glider--Written Tests are included in this study guide. It must be re-emphasized, 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--Glider--Written Tests contain 80 test items and 4 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 matter, 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.

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 or final glide 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 calculators is subject to the following limitations: (1) prior to, and on completion of the written test, the applicant must actuate the "on/off" switch to ensure erasure of any data stored in memory circuits; (2) the use of electronic calculators incorporating permanent or continuous type memory circuits without erasure capability is not authorized; (3) tape printout of data must be surrendered at the completion of the written test, if the calculator incorporates this design feature; and (4) the use of magnetic cards, tapes, modules, or any other device upon which prewritten programs or information related to the written test can be stored and retrieved, is prohibited.

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--Glider--Written Tests, samples of the actual General Instructions, Written Test Application 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. 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 correctly. 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

Professionalism in flight instruction is as important as it is in any field classified as a profession. To enhance professionalism in the field of flight instructing the prospective flight instructor should establish and maintain a current technical library. By obtaining study materials that are beneficial and appropriate to preparation for certification, prospective flight instructors will be starting a personal aeronautical library for use throughout their careers. The following list contains titles of essential reference materials but does not include all the useful material that is available. Many excellent textbooks, audiovisual training aids, and instructional materials produced commercially may be obtained from various bookstores and fixed-base operators engaged in flight training.

1. 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. 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 by the Superintendent of Documents as well as those distributed free of charge by the Department of Transportation. The checklist also gives the addresses and phone numbers of the Superintendent of Documents bookstores throughout the United States.

Request AC 00-2, Advisory Circular Checklist, and other 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 the mailing list to receive free circulars as issued should write to:

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

For those publications sold through Superintendent of Documents, the address is:

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

2. Aviation Instructor's Handbook, AC 60-14, (Supt. Docs.). Designed to provide currently certificated flight and ground instructors and applicants for such certificates with comprehensive, accurate, and easily understood information on learning and teaching, and to relate this information to the aviation instructor's task of conveying aeronautical knowledge and skill to students.

3. Flight Training Handbook, AC 61-21A, (Supt. Docs.). Provides information and direction in the introduction and performance of training maneuvers for pilots who are requalifying or preparing for additional ratings, and for flight instructors. It also contains information relating to aerodynamics and aeromedical aspects of flight. Although written primarily for the airplane pilot, much of it is adaptable to the glider pilot.

4. Pilot's Handbook of Aeronautical Knowledge, AC 61-23B, (Supt. Docs.). Contains essential, authoritative information used in training and guiding applicants for pilot certification, flight instructors, and flying school staffs. This is optional study material that was designed as a text of basic aeronautical knowledge for the airplane pilot. However, most of the chapters are applicable to private and commercial glider pilot applicants.

5. Aviation Weather, AC 00-6A, (Supt. Docs.). Contains information on weather phenomena for pilots and other flight operations personnel.

6. Aviation Weather Services, AC 00-45B, (Supt. Docs.). This is a supplement to AC 00-6A and is periodically updated to reflect changes brought about by the latest technical capabilities and service demands. It not only explains current weather services and the uses of weather charts and printed weather messages, but also is an excellent source of study for pilot certification examinations.

7. Federal Aviation Regulations. Suggested Parts for study are

Part 1--Definitions and Abbreviations (Supt. Docs.).
Part 61--Certification: Pilots and Flight Instructors (Supt. Docs.).
Part 71--Designation of federal Airways, Area Low Routes, Controlled Airspace, and Reporting Points (Supt. Docs.).
Part 91--General Operating and Flight Rules (Supt. Docs.).

8. Airman's Information Manual (AIM): Basic Flight Manual and ATC Procedures. Presents information necessary for planning and conducting flights within the National Airspace System. It includes instructional and procedural information. It is available on a semiannual subscription basis to better serve the needs of the individual pilot.

9. Flight Test Guide--Private and Commercial Pilot Glider, AC 61-61A, (Supt. Docs.). A publication designed to assist the glider pilot applicant in preparing for the Private or Commercial flight test. The glider flight instructor should find this guide helpful in preparing students for either the Private or Commercial Glider flight test.

10. Practical Test Guide--Flight Instructor, AC 61-58A, (Supt. Docs.). A publication which will assist the instructor and applicants in preparing for the practical (oral and flight) test for a Flight Instructor Certificate bearing the ratings specified in Part 61 of the Federal Aviation Regulations. It contains information on the scope, standards, and administration of the instructor practical test.

11. VFR and IFR Exam-O-Gram, (Supt. Docs.). Brief, timely, and graphic articles developed and published on a continuing basis. They are nondirective in nature and are issued as an information service particularly to individuals interested in FAA Airman Written Tests. They relate to concepts, practices, and procedures critical to aviation safety, and assist in giving safety oriented information to airman applicants and practicing airmen. Exam-O-Grams are sold by the Superintendent of documents and may be ordered as described in AC 00-2SS.

12. Soaring Flight Manual. Published by the Soaring Society of America, it is de-

signed to provide ground training for private and commercial glider ratings.

13. The American Soaring Handbook. Published by the Soaring Society of America, this handbook represents the combined efforts of many of the veteran soaring pilots in this country. Each chapter is a separate booklet.

Chapter 2--Training.
Chapter 3--Ground Launch.
Chapter 4--Airplane Tow.
Chapter 5--Meteorology.
Chapter 6--Country and Wave Soaring.
Chapter 7--Equipment I, Instruments and Oxygen.
Chapter 8--Equipment II, Radio, Rope, and Wire.

14. The Joy of Soaring. A training manual published by the Soaring Society of America, designed to promote proficiency and safety in soaring activities by providing a comprehensive and authoritative description of training techniques for the beginner or experienced glider pilot.

15. The American Soaring Handbook, The Joy of Soaring, and Soaring Flight Manual may be obtained from bookstores, sailplane fixed-base operators, or ordered from:

The Soaring Society of America
P.O. Box 66071
Los Angeles, California 90066

16. Glider/Sailplane Flight Manuals and Owner's Manuals. Glider manufacturers issue manuals for each model. They may be obtained from individual glider manufacturing companies or from local glider dealers or distributors.

17. Wake Turbulence, AC 90-23D, (Free). Presents information on the subject of wake turbulence and suggests techniques that may help pilots avoid the hazards associated with wingtip vortex turbulence. Upon request, it is free of charge from the U.S. Department of Transportation, Publications Section, M-443.1, Washington, D.C. 20590.

18. National Transporation Safety Board. NTSB Part 830, Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft, and Preservation of Aircraft Wreckage, Mail, Cargo, and Records. (Free). Deals with notification and reporting procedures relating to accidents and lost or overdue aircraft in the United States, its territories, and possessions. Upon request, it is free of charge from:

National Transportation Safety Board
Printing and Distribution, AD-41
800 Independence Avenue, S.W.
Washington, D.C. 20594

19. Aeronautical 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."

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 an 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.

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.

(c) *Gliders.*

(1) The accident reporting requirements of the National Transportation Safety Board and the Federal Aviation Regulations applicable to glider pilot privileges, limitations, and flight operations;

(2) Glider navigation, including the use of aeronautical charts and the magnetic compass;

(3) Recognition of weather situations of concern to the glider pilot, and the procurement and use of aeronautical weather reports and forecasts; and

(4) The safe and efficient operation of gliders, including ground and aero tow procedures, signals, and safety precautions.

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.

(c) *Gliders.*

(1) The regulations of this chapter pertinent to commercial glider pilot operations, privilege, and limitations, and the accident reporting requirements of the National Transportation Safety Board;

(2) Glider navigation, including the use of aeronautical charts and the magnetic compass, and radio orientation;

(3) The recognition of weather situations of concern to the glider pilot 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 gliders, including ground and aero tow procedures, signals, critical sailplane performance speeds, and safety precautions.

STUDY OUTLINE

The study outline which follows is the framework for basic aeronautical knowledge that the prospective flight instructor should know. Each question on the FAA written test can be directly related to one or more of the topics contained in this outline. This subject matter is based on operationally realistic airman activity and meets the requirements specified in Federal Aviation Regulations, Title 14, Code of Federal Regulations (CFR).

I. THE LEARNING PROCESS

A. Definition of Learning.

B. Characteristics of Learning.

1. Learning is purposeful.
2. Learning comes through experience.
3. Learning is multifaced.
4. Learning is an active process.

C. Laws of Learning.

1. Law of readiness.
2. Law of exercise.
3. Law of effect.
4. Law of primacy.
5. Law of intensity.
6. Law of recency.

D. How People Learn.

1. Perceptions.
2. Factors which affect perception.
3. Insights.
4. Motivation.

E. Levels of Learning.

F. Learning Skills.

1. Physical skills involve more than muscle.
2. Desire to learn.
3. Patterns to follow.
4. Perform the skill.
5. Knowledge of results.
6. Progress follows a pattern.
7. Duration and organization of lesson.
8. Evaluation versus critique.
9. Application of skill.

G. Forgetting and Retention.

1. Theories of forgetting.
2. Retention of learning.

H. Transfer of Learning.

I. Habit Formation.

J. Obstacles to Learning During Flight Instruction.

K. The Instructor's Role in Flight Training.

II. HUMAN BEHAVIOR

A. Control of Human Behavior.

B. Human Needs.

1. Physical needs.
2. Social needs.
3. Egoistic needs.
4. Self-fulfillment needs.

C. Defense Mechanisms.

1. Rationalization.
2. Flight.
3. Aggression.
4. Resignation.

D. The Instructor's Role in Human Relations.

1. Keep students motivated.
2. Keep students informed.
3. Approach students as individuals.
4. Give credit when due.
5. Criticize constructively.
6. Be consistent.
7. Admit errors.

III. EFFECTIVE COMMUNICATION

A. Basic Elements of Communication Process.

1. Source.
2. Symbols.
3. Receiver.

B. Barriers to Effective Communications.

1. Lack of common core of experience.
2. Confusion between the symbol and the thing symbolized.
3. Overuse of abstractions.

IV. THE TEACHING PROCESS

A. Preparation.

B. Presentation.

C. Application.

D. Review and Evaluation.

V. TEACHING METHODS

A. Organizing Material.

1. Introduction.
2. Development.
3. Conclusion.

B. Lecture Method.

1. Types of lectures.
2. Teaching lecture.
3. Preparing the teaching lecture.
4. Suitable language.
5. Types of delivery.
6. Use of notes.
7. Formal versus informal lectures.
8. Advantages and disadvantages of the lecture.

C. Guided Discussion Method.

1. Use of questions in a guided discussion.
2. Planning a guided discussion.
3. Student preparation for a guided discussion.
4. Guiding a discussion-instructor technique.

D. Demonstration-Performance Method.

1. Explanation phase.
2. Demonstration phase.
3. Student performance and instructor supervision phases.
4. Evaluation phase.

E. The "Telling and Doing" Technique in Flight Instruction.

1. Instructor tells-instructor does.
2. Student tells-student does.
3. Student does-instructor evaluates.

F. Programmed Instruction.

1. One method of programing.

VI. THE INSTRUCTOR AS A CRITIC

A. Purpose of a Critique.

B. Characteristics of an Effective Critique.

1. A critique should be objective.
2. A critique should be flexible.
3. A critique should be acceptable.
4. A critique should be comprehensive.
5. A critique should be constructive.
6. A critique should be well organized.
7. A critique should be thoughtful.
8. A critique should be specific.

C. Methods of Conducting Critiques.

1. Instructor-student critique.
2. Student-led critique.
3. Small-group critiques.
4. Individual student critique.
5. Written critique.
6. Self-critique.

D. Ground Rules for Conducting a Critique.

VII. EVALUATION

A. Oral Quizzing.

1. Characteristics of effective questions.
2. Types of questions to avoid.
3. Answering students' questions.

B. Written Tests.

1. Characteristics of a good test.
2. Written test items.
3. Effective item writing.
4. Principles to follow.

C. Performance Tests.

1. Uses of performance testing.
2. Demonstrations of piloting ability.

VII. INSTRUCTIONAL AIDS

A. Theory Behind Use of Instructional Aids.

B. Reasons for Using Instructional Aids.

C. Guidelines for Use of Instructional Aids.

D. Types of Instruction Aids.

1. Chalkboard.
2. Models.
3. Charts.
4. Projected material.

E. Future Developments.

IX. FLIGHT INSTRUCTOR RESPONSIBILITIES

A. Professionalism.

1. Sincerity.
2. Acceptance of the student.
3. Personal appearance and habits.
4. Demeanor.
5. Safety practices and accident prevention.
6. Proper language.
7. Self-improvement.

B. Helping Student Pilots Learn.

1. Providing adequate instruction.
2. Demanding an adequate standard of performance.
3. Emphasizing the "positive."

C. The Flight Instructor as a Practical Psychologist.

1. Anxiety.
2. Normal reactions to stress.
3. Abnormal reaction to stress.
4. Instructor's actions regarding seriously abnormal students.

D. Student Pilot Supervision and Surveillance.

E. Flight Instructor Endorsements.

F. Flight Test Recommendations.

G. Airplane Checkouts.

H. Refresher Training.

X. THE INTEGRATED METHOD OF FLIGHT INSTRUCTION

A. Definition.

B. Objectives.

1. Development of habit patterns.
2. Accuracy of flight control.
3. Operating efficiency.
4. Emergency capability.

C. Procedures.

D. Precautions.

E. Flight Instructor Qualifications.

XI. PLANNING INSTRUCTIONAL ACTIVITY

A. Course of Instruction.

1. Determination of standards and objectives.
2. Identification of blocks of learning.

B. Syllabus.

1. Sample ground training syllabus.
2. Sample flight training syllabus.

C. Lesson Plan.

1. Characteristics of a well-planned lesson.
2. How to use a lesson plan properly.
3. Lesson plan items.

FLIGHT INSTRUCTOR - GLIDER - KNOWLEDGE AREAS

I. FEDERAL AVIATION REGULATIONS

A. Parts 1/7: Definitions/Designation of Federal Airways, Area Low Route, Controlled Airspace, and Reporting Points.

1. Airport traffic area.
2. Ceiling.
3. Flight visibility.
4. Major alteration.
5. Major repair.
6. Pilot-in-command.
7. Federal airway.
8. Control area.
9. Continental control area.
10. Control zone.
11. Terminal control area.
12. Positive control area.

B. 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. Medical certificates.
7. General limitations.
8. Pilot logbooks.
9. Recent experience: Pilot-in-command.
10. Glider towing; experience/ instruction.
11. Private pilot privileges/ limitations.
12. Commercial pilot privileges/ limitations.
13. Flight Instructor: records/ authorizations/limitations.

C. Part 91: General Operating and Flight Rules--Subpart A.

1. Responsibility of pilot-in-command.
2. Pilot-in-command--more than one pilot.
3. Preflight action.
4. Careless or reckless operations.
5. Liquor and drugs.
6. Dropping objects.
7. Fastening of safety belts.
8. Parachutes and parachuting.
9. Towing gliders: safety/links/ waivers.
10. Civil aircraft: certificates required.
11. Aircraft airworthiness.
12. Aircraft operating limitations/ markings.
13. Supplemental oxygen.
14. Limited/restricted aircraft limitations.
15. Emergency locator transmitters.

D. Part 91: General Operating and Flight Rules--Subpart B.

1. Waivers.
2. Operating near other aircraft.
3. Right-of-way rules.
4. Acrobatic flights.
5. Minimum safe altitudes; general.
6. Altimeter settings.
7. Operation--in vicinity of airport.
8. Operation--airport with control tower.
9. Operation--airport without control tower.
10. Flight in terminal control areas.
11. Temporary flight restrictions.
12. Restricted and prohibited areas.
13. Positive control areas.
14. Basic VFR weather minimums.
15. VFR cruising altitude or flight level.

E. 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. Maintenance records/transfer of records.

II. NATIONAL TRANSPORTATION SAFETY BOARD PROCEDURAL REGULATION--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.

1. Preservation.

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

1. Reports and statements to be filed.

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 150--Airports.

IV. AIRMAN'S INFORMATION MANUAL

A. Basic Flight Manual and ATC Procedures.

1. Glossary of aeronautical terms.
2. Airport/marking/aids.
3. Controlled/uncontrolled airspace.
4. Operating at non-tower airports.
5. Special use airspace--prohibited, restricted, alert areas.
6. Aeronautical advisory stations (UNICOM).
7. Radiotelephone phraseology/ technique.
8. Traffic/wind direction indicators.
9. Obtaining weather information/ briefing.
10. Wake turbulence.
11. Medical facts for pilots.
12. Good operating practices.

B. Airport/Facility Directory.

C. Graphic Notices and Supplemental Data.

1. Terminal area graphic notices.
2. Parachuting jumping areas.
3. Heavy wagon and olive branch routes.

V. WEATHER

A. The Earth's Atmosphere.

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

B. Temperature.

1. Temperature measurement.
2. Heat and temperature.
3. Temperature aloft.
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.

D. Wind.

1. Basic theory of general circulation.
2. Convection.
3. Pressure gradient force.
4. Coriolis force.
5. Friction.
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. Condensation and sublimation products.

F. Stability or 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.

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. Structure of fronts.
2. Types of fronts.
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. Structural ice formation.
2. Ice producing cloud types.
3. Accretion rate of in-flight structural icing.
4. Types and intensities of in-flight structural icing.
5. Effects of in-flight structural icing.
6. Structural aircraft icing and frost on the ground.

L. Thunderstorms.

1. Conditions necessary for thunderstorm formation.
2. Thunderstorm structure.
3. Classification of thunderstorms.
4. Thunderstorm hazards.
5. Thunderstorm information from radar.
6. Tornadoes.

M. Obstruction to Vision.

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 System.

O. Weather Observations.

1. Surface weather observations.
2. Pilot weather 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. Adiabatic charts.
9. Stability charts.

Q. Aviation Weather Forecasts.

1. Terminal forecasts.
2. Area forecasts.
3. Route forecasts.
4. Winds aloft forecasts.
5. In-flight weather advisories.
6. Severe weather outlooks.
7. Severe weather forecasts.
8. Surface analyses and prognoses.

R. Services to Pilot.

1. FSS briefing.
2. Transcribed weather broadcasts (TWEB).
3. Pilots automatic telephone weather answering service (PATWAS).

S. Determining Cloud Height from Reports.

T. Information in a Weather Briefing.

U. Mountain Effects.

1. Turbulence.
2. Weather.

V. Soaring Weather.

1. Thermals.
2. Ridge lift.
3. Mountain waves.

VI. NAVIGATION

A. General.

1. Sectional chart interpretation.
2. Relating chart symbols to FAR.
3. Pilotage/recognition of landmarks.

4. Determining courses/distances on charts.
5. Planning traffic pattern.
6. Computing rate-of-climb/descent.
7. Determining go ahead points.

B. Radio Navigation.

1. Characteristics of VOR facilities.
2. Tuning VOR receivers.
3. Identifying VOR stations.
4. VOR interpretation/orientation.

C. Radio Communications.

1. VHF radio communications/ phraseology.

VII. AERODYNAMICS AND PRINCIPLES OF FLIGHT

A. Laws of motion.

B. Functions of the Flight Controls.

C. Principles of Airfoils.

D. Wing planform.

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

E. Forces Acting on the Aircraft.

F. Flight Controls/Axes of the Aircraft.

G. Lift/Drag During Turns.

H. Lift Versus Angle of Attack.

I. Lift Versus Air Density.

J. Types of Flaps, Spoilers, Divebrakes.

K. Effect of Flaps, Spoilers, Divebrakes.

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

M. Aileron Drag.

N. Slipping/Skidding Turns.

O. Types and Effect of Drag/Induced/ Parasite/Profile.

P. Ground Effect.

Q. Loads/Load Factors.

R. Stability/Static and Dynamic/ Longitudinal/Lateral/Directional.

S. Stalls/Spins.

T. Relative Wind/Angle of Attack.

U. Effect of Wind During Turns.

VII. GLIDER/SAILPLANE OPERATION

A. General.

1. Preflight/postflight safety practices.
2. Wake turbulence--causes/ precautions.
3. Crosswind takeoff/landing.
4. Proper loading of the aircraft.
5. Use of oxygen and oxygen equipment.
6. Mid-air collision avoidance precautions.
7. Procedures of assembly and disassembly.
8. Towrope/cable/hooks/releases.
9. Standard visual signals.
10. Aero towing procedures.
11. Ground towing procedures (auto).
12. Ground towing procedures (winch).
13. Traffic pattern/landing.
14. Use of speed limiting devices.
15. Off-field landings.
16. Sharing thermals.
17. Sharing ridge lift.
18. Cross-country procedures.
19. Emergencies--rope break, towplane power failure, etc.
20. Downwind landing.
21. Rate of descent in still air chart.
22. Slack in towline.
23. Accidental stall recoveries.
24. Inspection of launch equipment.
25. Aircraft documents and records.
26. Flaps operation.

B. Performance.

1. Performance charts.
2. Flying through or around the wake.
3. Calculating speeds-to-fly.
4. Tow speeds.
5. Computing density/pressure altitudes.
6. Effect of density altitude on performance.

7. Effect of weight/balance on performance.
8. Critical performance speeds.
9. Effect of wind on aircraft performance.
10. Bank/speed versus rate/radius of turn.
11. Stall speed versus altitude or attitude.
12. Stall speed versus indicated/true airspeed.
13. Computation of gross weight/useful load/ballast.
14. Minimum sink speed.
15. Glide ratio--L/D.
16. Speed-to-fly.
17. Best-glide-speed.
18. Glider performance curves.
19. Airspeed for searching for lift.
20. Flight at critically slow airspeeds.
21. Ridge and mountain soaring/ thermaling.
22. Vg diagram.

IX. INSTRUMENTS AND SYSTEMS.

A. Altimeter Operation/Errors.

B. Altimeter Setting Procedures/ Significance.

C. Pitot-Static Systems/Instruments.

D. Magnetic Compass Operation/Errors.

E. Airspeed Indicator Operation/Errors.

F. Variometer and Audio Device, Function and Adjustment.

G. Oxygen Supply and Pressure Gauge.

H. Turn Indicator/Coordinator.

I. Radio Equipment (Communications/ Navigation).

J. Yaw String.

X. PHYSIOLOGICAL FACTORS RELATED TO FLIGHT

A. Adjustment to the Flight Environment.

1. Ground habits vs. flight habits.
2. Individual differences in pilots.

B. Reaction of the Body to Changes in Atmospheric Pressure.

1. Changes in altitude.
2. Aerosinusitis.

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

1. Hypoxia.
2. Hyperventilation.

D. Self-Imposed Stress.

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

E. Sensations of Flight.

1. Body sensory systems involved in equilibrium.

a. Eyes.
b. Inner ear.
c. Skeletal muscles.

2. Sensory illusions in flight-- vertigo--spatial disorientation.

F. Oxygen Equipment.

1. Requirements.
2. Types of oxygen.
3. Storage of oxygen.
4. Regulators and masks.
5. Use of oxygen equipment.

AIRMAN WRITTEN TEST APPLICATION

SAMPLE

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 FOLLOWING PARAGRAPH CAREFULLY BEFORE COMPLETING THIS APPLICATION:**

  WHOEVER, IN ANY MATTER WITHIN THE JURISDICTION OF ANY DEPARTMENT OR AGENCY OF THE UNITED STATES KNOWINGLY AND WILLFULLY FALSIFIES, CONCEALS OR COVERS UP BY ANY TRICK, SCHEME, OR DEVICE A MATERIAL FACT, OR MAKES ANY FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS 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.**

SAMPLE

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

CATEGORY	TEST NUMBER	TAKE NO.	SECTIONS 1 2 3 4 5 6 7	EXPIRATION MONTH DAY YEAR

CARD B

CERTIFICATED SCHOOL NUMBER	MECH EXP DAYS BY SECTION 1 2 3	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	

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AC FORM 8080-3(12-76)(0052-00-317-2006) Supersedes previous edition

— PAGE 4 —

SAMPLE TEST ITEMS

The following test items are included to familiarize applicants with the type of questions that they may expect to find in the tests required for a Flight Instructor Certificate with a Glider Rating. Keep in mind that these sample items contain only a few of the topics found in the FAA written tests. It is for this reason that concentration of study on the subjects in the study outline "Fundamentals of Instructing" and study outline "Flight Instructor--Glider" should be emphasized. A knowledge of all the topics mentioned in these outlines--not just the mastery of these sample test items--should be used as the criterion for determining that you are properly prepared to take the FAA written tests.

There are two tests involved in the certification process. One test examines basic knowledge in "Fundamentals of Instructing" and the other examines basic knowledge in "Flight Instructor--Glider" subject matter. If the applicant for this certificate and rating already possesses a Flight Instructor Certificate he will not be required to take the "Fundamentals of Instructing" written test.

FUNDAMENTALS OF INSTRUCTING WRITTEN TEST

1. Motivation is a key factor in learning. In properly motivating students, a flight instructor should remember that

   1- students are innately able to evaluate their proficiency and rate of progress and will instinctively tend to arrive at correct self-concepts, if properly motivated.
   2- it is best to emphasize long-range goals more than short-range goals.
   3- positive motivations are characteristically more effective than negative motivations.
   4- all of the above statements are considered true.

2. On which of the following is the teaching success of a flight instructor considered to be most dependent?

   1- Personality of the instructor.
   2- Presentation by the instructor.
   3- Flying ability and flight experience.
   4- Proper planning of lessons.

3. Which of the following is most often the cause of poor student performance in learning to fly a glider?

   1- Negative transfer.
   2- Ignorance of correct procedures.
   3- Fear, anxiety, and phobia.
   4- Faulty habit patterns.

4. When a student cannot accept the real reason for his behavior, he may attempt to alleviate his feeling of guilt by relying on the defense mechanism called

   1- flight.
   2- rationalization.
   3- aggression.
   4- resignation.

5. Which law of learning implies that a student will learn more from the real thing than from a substitute?

   1- Law of effect.
   2- Law of recency.
   3- Law of intensity.
   4- Law of primacy.

6. The largest percentage of a normal person's knowledge is acquired through which of these senses?

   1- Sight.
   2- Smell and taste.
   3- Touch.
   4- Hearing.

7. Although defense mechanisms can serve a useful purpose, they also can be hindrances because they

   1- destroy feelings of failure.
   2- alleviate the causes of problems.
   3- provide feelings of adequacy.
   4- involve self-deception and distortion of reality.

8. Which statement is true regarding effective communication?

   1- To be most effective as a communicator, an instructor should use abstract words as much as possible.
   2- The most effective communicator relies on a single, proven channel to transmit his ideas.
   3- Unless a common core of experience exists between the communicator and the receptor, effective communication will be difficult to achieve.
   4- Effective communication has taken place when the receiver acknowledges receipt of the information.

9. Which of these learning experiences would be the most effective in the learning process?

   1- Those which present a minimum challenge to the student.
   2- Experiences which involve the student's feelings, thoughts, and memories of past experiences.
   3- Experiences which are totally new and unrelated to the learner's previous experiences.
   4- Those in which the student need only commit something to memory.

10. When students display the defense mechanism called aggression, they

    1- attempt to justify actions that otherwise would be unacceptable.
    2- may refuse to participate in the activities of the class.
    3- develop symptoms or ailments that give them satisfactory excuses for removing themselves from frustration.
    4- become so frustrated they lose interest and give up.

11. When students subconsciously use the defense mechanism called rationalization, they

    1- develop symptoms that give them excuses for removing themselves from frustration.
    2- cannot accept the real reasons for their behavior.
    3- become aggressive against something or somebody.
    4- no longer believe it profitable or even possible to work further.

FLIGHT INSTRUCTOR--GLIDER WRITTEN TEST

1. A significant thunderstorm hazard is the rapid change in wind direction and speed which occurs near and at the surface

   1- while the storm is passing.
   2- immediately after the storm has passed.
   3- immediately before the passage of the storm.
   4- as a result of the horizontal spreading out of the storm's updrafts.

2. In using the magnetic compass to establish and maintain your heading, you should know that the normal characteristics of a compass in the Northern Hemisphere will usually cause it to indicate a turn toward the

   1- west as you enter a medium banked left turn from a south heading.
   2- east as you enter a medium banked left turn from a north heading.
   3- south when you accelerate on an east heading.
   4- north when you decelerate on a west heading.

3. Consider the following Aviation Weather Report Prescott, Arizona, where the airport elevation is 5,042 feet:

   PRC 13Ø SCT 45 Ø67/68/31/2728/991

   While flying over this airport you would expect to encounter the base of the clouds at approximately

   1- 18,042 ft. MSL.
   2- 13,000 ft. MSL.
   3- 4,500 ft. MSL.
   4- 7,958 ft. MSL.

4. The most likely error by the glider pilot during airplane tow, while maintaining the "high tow" position, is allowing the glider to get too

   1- low.
   2- far left.
   3- far right.
   4- high.

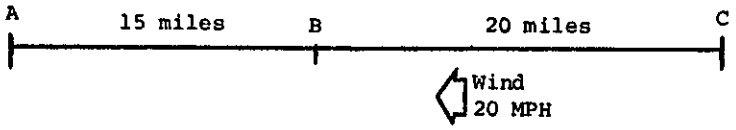


Figure 1

5. Which of the following statements pertaining to angle of attack is correct?

   1- If a constant airspeed can be maintained, the angle of attack will increase as the pitch is increased.
   2- It is possible for the wing of a glider to pass through the air at a high angle of attack even though a constant altitude is maintained.
   3- A glider in a descent will normally have a negative angle of attack.
   4- Regardless of the angle of attack, stalls will occur only at low or comparatively low airspeeds.

6. When a slight upward, or negative, flap deflection is used, the result is

   1- increased drag.
   2- increased lift.
   3- decreased drag.
   4- decreased lift.

7. When the sailplane is turning in flight, the force that opposes the inward turning force is called

   1- counterforce.
   2- adverse yaw.
   3- gravity.
   4- centrifugal force.

8. At what bank angle will the resultant of gravity and centrifugal force equal twice the sailplane's weight?

   1- 15°.
   2- 30°.
   3- 45°.
   4- 60°.

9. A distance of 300 kilometers on a straight line, cross-country flight is the equivalent of approximately

   1- 162 nautical miles.
   2- 186 nautical miles.
   3- 215 nautical miles.
   4- 315 nautical miles.

10. If a knot develops in a towrope which has a normal tensile strength of 1,800 lbs., what would be the approximate strength of the rope?

    1- 575 lbs.
    2- 750 lbs.
    3- 900 lbs.
    4- 1,150 lbs.

11. Refer to Figure 1 and the course for a goal flight from A to C. If the glider has a normal L/D of 23:1 while a constant airspeed of 45 MPH is maintained, what minimum altitude above the ground is needed at point B to arrive over C at 800 feet above the ground with no sinking air?

    1- 9,600 feet AGL.
    2- 10,560 feet AGL.
    3- 11,560 feet AGL.
    4- 7,560 feet AGL.

12. Refer to Figure 2 on page 22. Note that the glider has a normal L/D of 23:1 at an airspeed of 50 MPH. What would be the effective L/D with respect to the ground with a 20 MPH tailwind?

    1- 32:1.
    2- 25:1.
    3- 23:1.
    4- 18:1.

13. Refer to Figure 3 on page 22. Which statement is true when the glider is operated in the high-performance category and the dive brakes/spoilers are in the closed position?

    1- The wings-level stall speed is 45 MPH.
    2- The design dive speed is 150 MPH.
    3- The never-exceed speed is 167 MPH.
    4- The design maneuvering speed is 76 MPH.

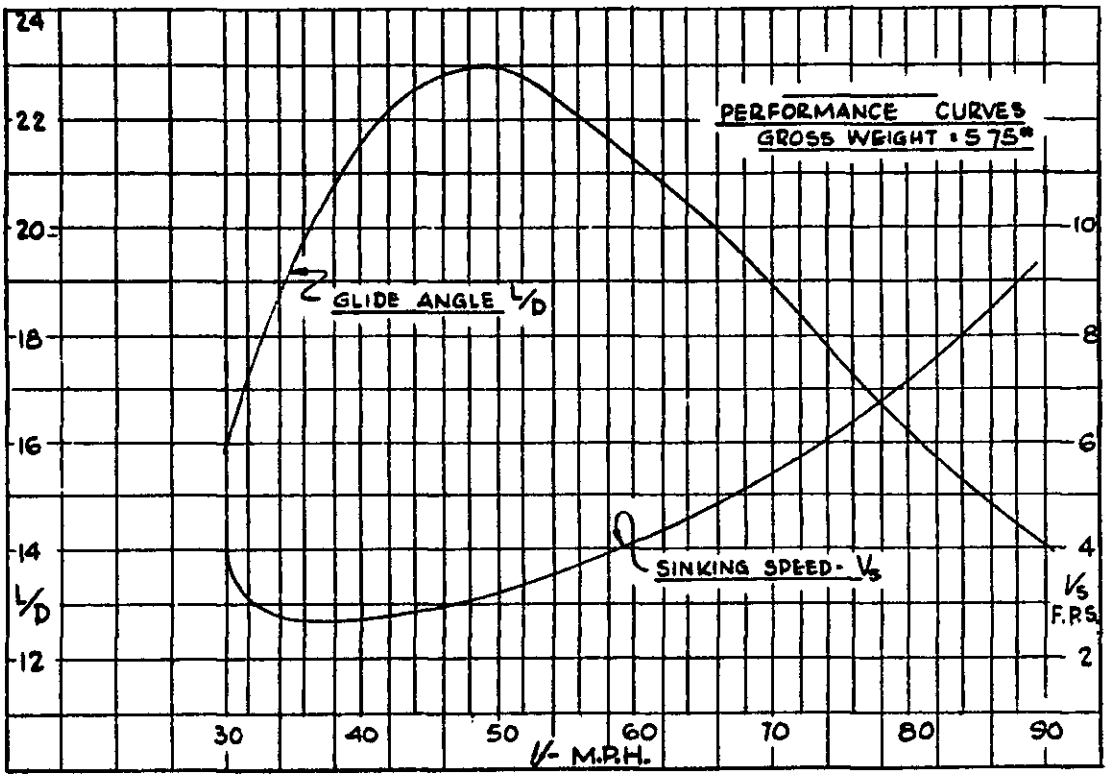


Figure 2

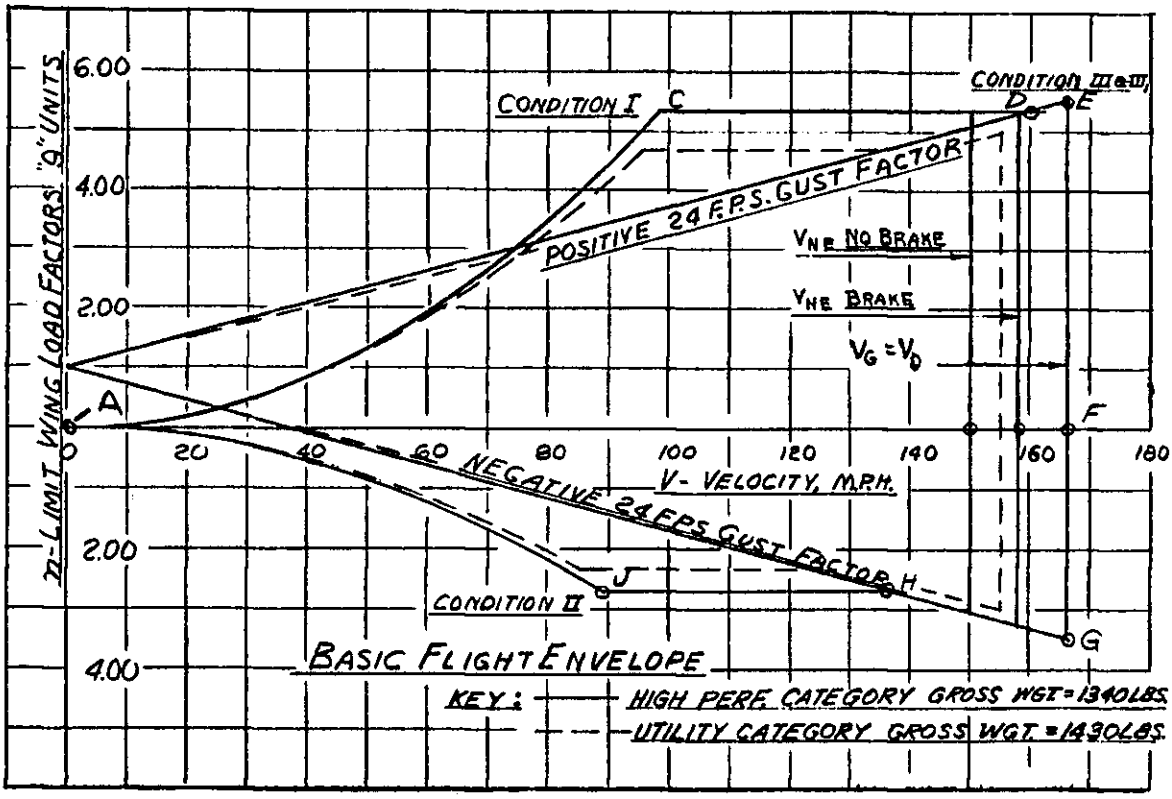


Figure 3

Given:

IAS (MPH)	45	50	55	60	65
Sink rate FPM (glider) . . .	174	192	216	246	282
+100 FPM (sink air)	274	292	316	346	382
Time to fly 1 mile (min.) . .	1.33	1.2	1.09	1.0	0.923
Altitude lost each mile . . .	365	351	344	346	353

14. On the basis of the above computations for various airspeeds derived from the glider's performance curve, what is the appropriate "speed-to-fly" to conserve altitude during interthermal flight in sinking air of 100 feet per minute?

    1- 45 MPH.
    2- 50 MPH.
    3- 55 MPH.
    4- 65 MPH.

15. Refer to Figure 4 on page 24 and the soundings recorded on the Pseudo-Adiabatic Chart. Assume that the surface temperature is expected to reach these values at the specified times:

    68° F. at 0800 local time
    77° F. at 1000 local time
    86° F. at 1200 local time
    91° F. at 1400 local time

    What would be the earliest time at which good thermals up to 13,000 feet can be expected?

    1- 0800 local time.
    2- 1000 local time.
    3- 1200 local time.
    4- 1400 local time.

16. Refer to Figure 5 on page 24. If the rear seat pilot weighs 190 lbs. and the front seat passenger weighs 75 lbs., where would the CG be located and would it be within or outside limits?

    1- Station 87.00 and it would be outside the limits.
    2- Station 66.34 and it would be within the limits.
    3- Station 96.12 and it would be within the limits.
    4- Station 74.70 and it would be outside the limits.

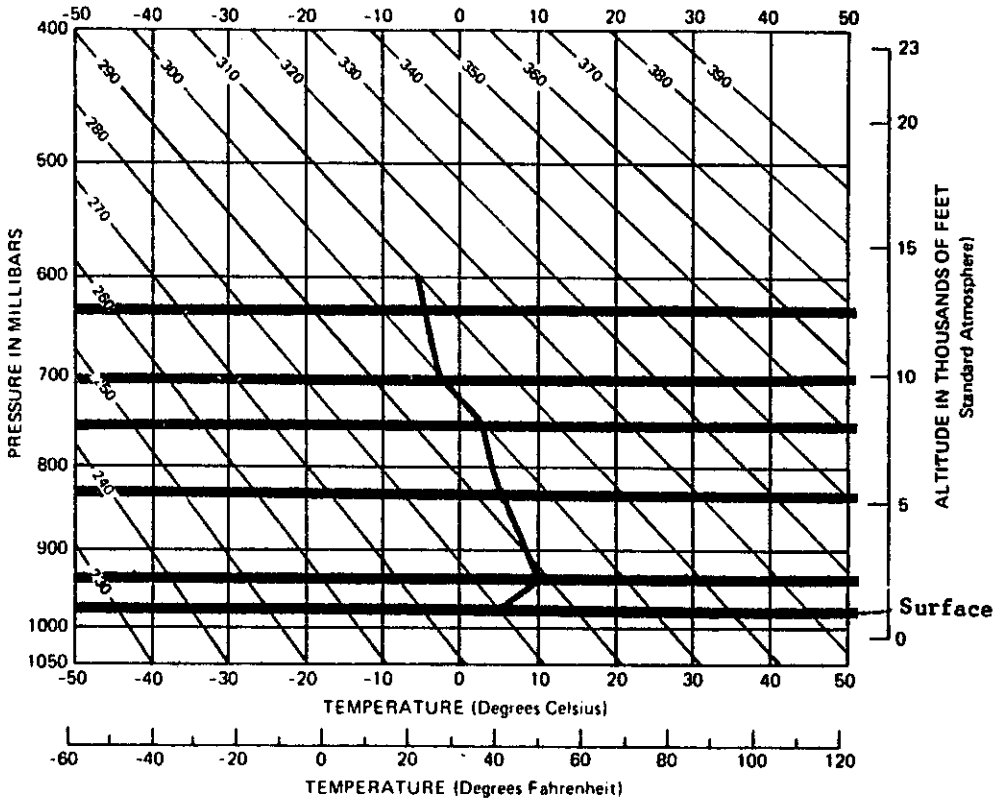
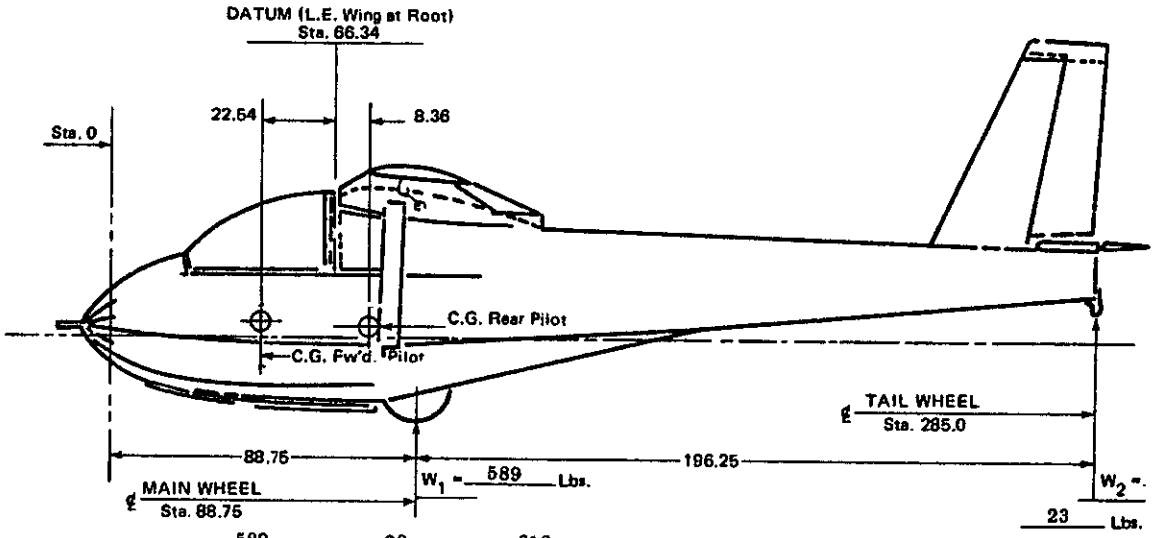


Figure 4



Empty Wt. = $W_1 + W_2$ = 589 + 23 = 612 Lbs.

Empty C.G. (Sta.) = $\frac{W_2 \times 196.25}{W_1 + W_2} + 88.75$ = $\frac{23 \times 196.25}{612} + 88.75$ = Sta. 96.12

CLASS II, UTILITY: C.G. Limits - Sta. 78.20 to Sta. 86.10, or. 11.86" to 19.76" Aft Datum.

Figure 5

ADDITIONAL QUESTIONS FOR STUDY

Answers and explanations are not included with the following questions. These questions are intended to direct study to selected areas, but by no means cover all subject areas found in the Fundamentals of Instructing or Flight Instructor--Glider written tests.

1. What is the meaning of "perceptions"?
2. What are "insights" as applied to learning?
3. How should a glider flight instructor deal with the problem of student airsickness?
4. Can you always expect temporary random plateaus in the learning rate of each student?
5. Should the flight syllabus provide a step-by-step progression of learning with regular review and evaluation?
6. What are the four basic steps in the teaching process?
7. Should a student be kept constantly aware of his progress?
8. What are "blocks of learning"?
9. Does oral quizzing of students reveal the effectiveness of the instructor's training procedures?
10. Will accepting lower standards to please a student effect a genuine improvement in the instructor-student relationship?
11. What are the forces acting on a glider in flight?
12. How does air density affect glider performance?
13. What effect does increasing weight or adding ballast have on glider performance?
14. What is meant by adverse yaw when entering a turn?
15. What is the proper way to recover from a high-speed spiral?
16. Is it considered proper technique to place the "stick fully forward" on stall recoveries?
17. What is the proper technique for removing slack in the towline during an aero tow?
18. What are the standard soaring signals?
19. What are the pilot-in-command recency of experience requirements?
20. Where can the operating limitations for an aircraft be found?
21. How do you determine whether required inspections have been performed on a glider?
22. When is the use of supplemental oxygen required?
23. What are the requirements for acting as pilot-in-command of an aircraft towing a glider?
24. What is the minimum distance from a cloud formation for VFR glider operations outside of controlled airspace?
25. Is a total energy variometer responsive only to a change in total energy of the sailplane?
26. What is the band of clear air which often appears between the mountains and the first lenticular cloud called?
27. When is the intensity of the vortices created by large aircraft the greatest?
28. What radial of a VOR station are you on if you select 240° with the omnibearing selector (OBS), and receive a "FROM" indication with the Course Deviation Indicator needle centered?
29. Should you use the UNICOM frequency 123.0 MHz when landing at airports that are not served by an ATC tower or FSS?
30. In which publication would you expect to find rules pertaining to aircraft accidents, incidents, and overdue aircraft?

*U.S. GOVERNMENT PRINTING OFFICE : 1980 O-333-934/6939