STUDY GUIDE

1976

UNITED STATES ARMY AVIATION
ANNUAL WRITTEN EXAMINATION

STUDY GUIDE

1976

Army Aviation Annual Written Examination

1. PURPOSE. This study guide has been designed and written to -

a. Refresh and reinforce the aviator's knowledge of important policies, regulations, and procedures, and to insure that major changes in these areas are brought directly to the attention of each aviator.

b. Assist aviators in performing their aviation duties and maintaining their aviation skills at the highest possible level.

c. Assist aviators in preparing for the Annual Aviation Written Examination required by AR 95-63.

2. SCOPE.

a. This study guide is composed of questions on a variety of aviation and related subjects designed to accomplish the purpose stated above.

b. The reporting of errors, omissions, and recommendations for improving this study guide by the individual user is encouraged. Reports and recommendations should be forwarded direct to Commander, US Army Aviation Center, ATTN: Deputy for Training Developments, ATZQ-TD-TAD, Fort Rucker, Alabama 36362.

3. USE. Although this study guide is presented as a series of questions, it has been written to teach - not test. Each question has space provided for a written answer. Questions should be completed without referring to the answer and reference found on the reverse side of each page. The answers should be used as an immediate check on your own response either by individual question, page, or section. In using this study guide, emphasis should be placed on where information is found rather than memorization. To this end, the study guide has been arranged into sections according to <u>type</u> of publication. This arrangement may also assist users in cases where access to a complete set of references at any one time is difficult.

4. REFERENCES. The following references are to be used with this study guide and the 1976 Army Aviation Annual Written Examination.

a. Items furnished with study guide.

(1) FLIP Enroute Low Altitude Charts L-21 and L-22.

(2) 1976 Reference Data Booklet, Volumes I and II.

b. AR 95-1, Army Aviation: General Provisions and Flight Regulations, October 1973

c. AR 95-5, Aircraft Accident Prevention, Investigation, and Reporting, July 1975

d. AR 95-63, Army Aviation Standardization and Instrument Program, July 1973

e. FM 21-26, Map Reading, January 1969

f. E6B or MB4 computer.

TABLE OF CONTENTS

AR 95-1

1. Army aviators may deviate from flight regulations contained in AR 95-1 and parts of pertinent FAR when written Army directives are issued that specify the extent of deviation authorized.

2. Flying time for an aerial flight starts when an airplane begins to move forward on the takeoff run or when a helicopter lifts off the ground.

   Flying time ends when the aircraft has landed and the -

   1. Engines have stopped.

   2. A/C remains stationary, with engines operating for a period in excess of 5 mins.

   3. Flying crew changes.

3. When departing from a non-military airfield, it is the pilot's responsibility to insure that the flight plan has been activated through the control tower or the appropriate area flight service station.

4. An IFR clearance may not be requested unless the predominant weather at the destination is forecast on arrival to be -

   Ceiling - at or greater than the published MDA or DH for the approved approach.

   Visibility - equal to or greater than the authorized minimum visibility or RVR

1. ANSWER: written Army directives REFERENCE: AR 95-1, page 1-1, para 1-4b.

2. ANSWER: 5 minutes REFERENCE: AR 95-1, page 3-6, para 3-26d.

3. ANSWER: departure field control tower REFERENCE: AR 95-1, page 4-2, para 4-6c.

4. ANSWER: Ceiling - equal to or greater than the lowest appropriate DH or MDA for the anticipated approach.

Visibility - equal to or greater than the appropriate authorized minimum visibility or RVR equivalent. REFERENCE: AR 95-1, para 4-23a.

5. An alternate airfield is required if the weather at the destination is forecast to be less than -

Ceiling - 400 feet above the published ceiling.

Visibility - 1½ miles above that required.

6. An alternate airfield will be designated regardless of forecast weather when filing IFR to a destination where radar serves as the sole approach aid.

7. An airfield with authorized procedures other than US Army or FAA may not be listed as an alternate unless current weather forecasts indicate that the ceiling and visibility will be at or greater than 400 feet above published and ½ mile greater than published from 1 hour before through 1 hour after ETA.

8. Takeoff minima for aviators operating a helicopter and possessing an instrument rating are - ceiling 100, visibility ½, or RVR 1600 (less than 50 hours AI).

9. A circling approach may be initiated if the ceiling and visibility are reported equal to or higher than the published circling approach minima.

5. ANSWER: ceiling - 400 feet above the ceiling required for the approach procedure to be flown.

Visibility - 1 1/2 miles greater than the visibility required for the approach to be flown.

REFERENCE: AR 95-1, para 4-23b.

6. ANSWER: radar

REFERENCE: AR 95-1, para 4-23b.

7. ANSWER: 400 feet above and visibility 1 1/2 miles greater than the authorized approach minimums

REFERENCE: AR 95-1, para 4-24.

8. ANSWER: 100 feet
1/4 mile
1600 feet

REFERENCE: AR 95-1, para 4-25b(2).

9. ANSWER: the MDA and the minimum visibility authorized under circling landing minima for that airfield

REFERENCE: AR 95-1, para 4-26f.

10. A straight-in approach may be initiated if the visibility or RVR is reported to be at or greater than Published minima.

11. The weather forecaster will enter in the "Briefing Void After" block of the DD 175 the current GMT time, plus 1 1/2 hours and sign the form.

10. ANSWER: that authorized for procedure to be flown

NOTE: Ceiling is not a consideration.

REFERENCE: AR 95-1, para 4-26f.

11. ANSWER: (1+30) One hour and thirty minutes

REFERENCE: AR 95-1, page 4-1, para 4-3b.

FLIGHT INFORMATION PUBLICATIONS (FLIP)

1. Decode the following NOTAM's:

   a. QEEIF _____.

   b. QAHAL _____.

   c. QAHES1 _____.

2. If you are filing a composite flight plan, you should check which block(s) under "Type of Flight Plan" on the DD Form 175?
   IFR & VFR.

3. On an IFR stopover flight plan, the alternate for the second leg of the flight (if required) would be entered on the DD Form 175 in the Route of flight following the full entry.

4. For an IFR flight, the time shown in the "ETE" block on your DD Form 175 would be the time flown from Origin to the FAF.

5. When filling out DD Form 175, distance to destination will be computed as follows:

   VFR - the distance from the base of departure to Destination.

   IFR - The distance (including the SID if applicable) from the base of departure to the IAF or facility intended to be used for penetration and/or approach to the destination.

FLIGHT INFORMATION PUBLICATIONS (FLIP)

1. ANSWER: a. GCA flight checked and found reliable
   b. NDB operating on reduced power
   c. NDB out of service until further notice

   REFERENCE: General Planning. (RDB I, p 31 thru 34).

2. ANSWER: Check both VFR and IFR
   NOTE: Do not combine "IFR" and "VFR" route segments on the same line entry.

   REFERENCE: General Planning. (RDB I, p. 39.)

3. ANSWER: "Route of Flight" section, following the fuel entry

   REFERENCE: General Planning. (RDB I, p. 40.)

4. ANSWER: takeoff
   last fix shown

   REFERENCE: General Planning. (RDB I, p. 40.)

5. ANSWER: VFR - the base of destination
   IFR - initial approach fix

   REFERENCE: General Planning (RDB I, p. 42.)

6. Should a pilot for any reason be incapable of complying with any provision of an issued ATC clearance or restriction added thereto, he is expected to immediately advise ATC.

7. When may IFR position reports over compulsory reporting points be ommitted? when informed by ATC "radar contact"

8. "Copter" instrument approaches, depicted in FLIP Low Altitude Instrument Approach Procedures, are restricted to 90K IAS.

9. US military helicopters may utilize the aircraft approach category A minimums.

10. Five approach categories (A through E) control landing minima for different types of aircraft. Except for certain military aircraft, aircraft are categorized on the basis of weight and speed.

11. Aerodrome elevation is the highest point on the landing surface expressed in feet above sea level.

6. ANSWER: immediately advise ATC REFERENCE: General Planning. (RDB I, p. 50).

7. ANSWER: When informed by ATC that the aircraft is in "radar contact." REFERENCE: General Planning, (RDB I, p. 52).

8. ANSWER: 90 knots REFERENCE: General Planning, (RDB I, p. 72).

9. ANSWER: Category A REFERENCE: General Planning, (RDB I, p. 72).

10. ANSWER: speed and weight REFERENCE: General Planning. (RDB I, p. 72.)

11. ANSWER: feet above MSL REFERENCE: IFR Supplement, (RDB I, p. 91).

12. All US ATC facilities recognize Mode 3, Code 3100 series as meaning A/C is being hijacked/forced to a new destination.

13. Should the pilot of an aircraft equipped with a coded radar beacon transponder experience a loss of 2-way radio capability, he should adjust his transponder to reply on emergency and Mode 3, Code 7700 for approximately 1 minute, then change to Code 7600 and repeat every 15 minutes.

14. A visual light signal from a control tower to an aircraft consisting of a series of red and green flashes means proceed with caution.

15. What is the magnetic course, MEA, and distance from Barkley Intersection to the Fort Campbell NDB, (Panel C, En Route Low Altitude Chart L-21)? _____.

12. ANSWER: 3100 REFERENCE: IFR Supplement. (RDB I, p. 122.), or General Planning (RDB I, page 54).

13. ANSWER: 7700 REFERENCE: IFR Supplement. (RDB, p. 126.)

14. ANSWER: general warning signal
exercise extreme
caution REFERENCE: IFR Supplement, (RDB I, p. 129).

15. ANSWER: 101°
2500
19.8 REFERENCE: Low Altitude Approach Chart, (RDB I, p. 161).

SAMPLE FLIGHT PLANNING PROBLEMS

GENERAL: This section contains questions which require you to apply AR 95-1 rules against specific airfields and circumstances. For purposes of these questions, assume your aircraft is equipped with full ILS, VOR, and ADF capability. For fixed wing, all questions pertain to category A aircraft.

1. What is the minimum weather condition that can be forecast for you to request IFR clearance to Nashville Metropolitan Airport in a fixed wing aircraft? In a rotary wing aircraft?

2. What is the minimum weather condition that could be forecast for Nashville Metropolitan that would not require an alternate airfield for fixed wing? Rotary wing?

3. What is the minimum weather condition required to designate Godman Army Airfield as an alternate airfield for an IFR flight in a fixed wing aircraft? In rotary wing?

4. What is the minimum weather condition required to designate Campbell Army Airfield as an alternate airfield for an IFR flight in a fixed wing aircraft? In rotary wing? (Assume the ILS RWY 22 approach is not in service.)

1. ANSWER: FW - 200' ceiling and 1/2 mile visibility
FW - 200' ceiling and 1/4 mile visibility

REFERENCE: AR 95-1, para 4-23b and 4-26, RDB I, p. 174.

2. ANSWER: FW - 600' ceiling and 2 miles visibility
RW - 600' ceiling and 1-3/4 miles visibility

REFERENCE: AR 95-1, para 4-23b and 4-26d, RDB I, p. 174.

3. ANSWER: FW - 600' ceiling and 2 miles visibility
RW - 600' ceiling and 1 mile visibility

REFERENCE: AR 95-1, para 4-24c(1) and (3), RDB I, page 150.

4. ANSWER: FW - 900' ceiling and 2-1/4 miles visibility
RW - 900' ceiling and 1-1/8 miles visibility.

REFERENCE: AR 95-1, para 4-24c(2) and (3), RDB I, page 161.

SITUATION: At Nashville Metorpolitan, you receive the following clearance: "Cleared for the ILS runway 2L approach, circle to land runway 31."

5. What is the minimum reported weather condition that will allow you to begin this approach in a fixed wing aircraft? Rotary wing?

SITUATION: At Godman AAF, you receive the following clearance: "Cleared for the NDB approach, landing runway 17."

6. What is the minimum reported weather condtion that will allow you to begin this approach in a fixed wing aircraft? Rotary wing?

5. ANSWER: FW - 500' ceiling and 1 mile visibility
RW - 500' ceiling and 1/2 mile visibility

REFERENCE: AR 95-1, para 4-26f(2), RDB I, page 174.

6. ANSWER: FW - 1 mile visibility
RW - 1/2 mile visibility

REFERENCE: AR 95-1, para 4-26f(1). RDB I, page 164.

NOTE: Ceiling is not a consideration for beginning approaches to straight-in landings.

AR 95-5

1. DA Form 2696, Operational Hazard Report (OHR), provides commanders, and safety councils with immediate notification of any _____ that affects or may affect the safety of Army aircraft or associated personnel and equipment.

2. An Operational Hazard Report will be submitted to _____ _____ _____.

3. A current pre-accident plan must be developed and maintained for each _____.

4. The accident report is a privileged document and therefore, must have _____ protective markings.

AR 95-5

1. ANSWER: condition or act REFERENCE: AR 95-1, page 5-1, para 5-5.

2. ANSWER: unit aviation safety officer or airfield operations officer REFERENCE: AR 95-5, para 5-5h.

3. ANSWER: operational Army airfield REFERENCE: AR 95-5, para 8-2.

4. ANSWER: FOR OFFICIAL USE ONLY REFERENCE: AR 95-5, para 7-3.

AR 95-63

1. An aviator who does not successfully complete the required instrument examination (checkride) will have his instrument qualification invalidated. How long does he/she have to successfully complete a reexamination? _____ _____.

2. The minimum altitude for hooded approaches (fixed wing) when the observer is not proficient in the aircraft is _____ _____.

3. The minimum altitude for hooded approaches (rotary wing) when the observer is currently proficient in the mission type, design, and series helicopter being flown is _____ _____.

AR 95-63

1. ANSWER: 60 days from date of initial failure REFERENCE: AR 95-63, para 2-8c(2).

2. ANSWER: 500 feet AGL REFERENCE: AR 95-63, para 2-22c(2).

3. ANSWER: 100 feet AGL REFERENCE: AR 95-63, para 2-22d(1).

FM 21-26

1. There are several ways of indicating elevation and relief on maps. The most common way is by _____.

2. The spacing of the contour lines indicates the _____ of the slope.

3. Refer to the map on pages 2 and 3, RDB I. A grid azimuth of 330° on this map converts to a magnetic azimuth of _____.

4. A point on the map may be determined or plotted from a known point by giving a direction and a distance along that direction line. This method of point location uses _____ _____.

5. The method of locating one's unknown position by sighting on two or three known features is called _____.

1. ANSWER: contour lines REFERENCE: FM 21-26, para 6-2.

2. ANSWER: nature REFERENCE: FM 21-26, para 6-2.

3. ANSWER: 322° REFERENCE: RDB I, p. 3.
FM 21-26, para 5-4.

4. ANSWER: polar coordinates REFERENCE: FM 21-26, par 5-14.

5. ANSWER: resection REFERENCE: FM 21-26, para 5-10.

AIRCRAFT PERFORMANCE CHARTS

The study material in this section pertains to the sample performance charts on pages 183 thru 192 of RDB I. The first six problems provide step-by-step instructions on how the answer was obtained; the remainder give only the answer.

SITUATION: You are the pilot of UH-1H and have been assigned a mission requiring nap-of-the-earth flight for a portion of the route. The following information is provided for mission planning:

OAT = + 25°C
Pressure Altitude = 2500 feet
Gross Weight = 9500 pounds
Calibration factor - 56

1. What is the maximum calibrated torque available (30-minute limit)?

2. What is the maximum indicated torque available (30-minute limit) for your specific aircraft?

3. What is the maximum skid height at which your helicopter will hover with the maximum calibrated torque computed (47.5) in problem number 1?

1. ANSWER: 47.5 psi.

To determine the maximum calibrated torque available for the given conditions, refer to figure 14-4 (RDB, page 185). Enter pressure altitude 2500 feet; move right to OAT 25 degrees centigrade; then move straight down through the entire chart and read calibrated torque = 47.5.

2. ANSWER: 43 psi.

To determine the maximum indicated torque available for your aircraft refer to figure 14-4 (RDB, page 185). Enter pressure altitude 2500 feet; move right to OAT 25 degrees centigrade, then move down to calibration factor 56; move left and read indicated torque 43 psi.

3. ANSWER: 20 feet.

To determine the maximum hover skid height for the conditions specified in the situation given, refer to figure 14-5, HOVER. Enter pressure altitude 2500 feet; move right to OAT 25 degrees centigrade; move down to gross weight 9500 pounds; move left to the 47.5 psi line and read skid height = 20 feet.

4. **What is the maximum gross weight at which your helicopter will hover out of ground effect with the maximum calibrated torque computed from problem 1 (47.5 psi)?**

SITUATION: For an instrument flight in a UH-1H the following information is provided:

Gross weight - 9500 pounds.

Cruise altitude = 4000-foot pressure altitude.

OAT = 0 degrees centigrade.

Roof mounted pitot tube.

5. **What is the maximum range airspeed (indicated and true), fuel flow (bleed air ON), and torque required for the flight?**

4. ANSWER: 9250 pounds.

To determine the maximum gross weight for OGE hover at the conditions specified in the situation given, refer to figure 14-5 (RDB, page 187) HOVER. Enter pressure altitude 2500 feet; move right to OAT 25 degrees centigrade; move down to the gross weight scale. Enter calibrated torque 47.5; move up to skid height OGE line and move right to intersect the vertical line previously extended from OAT. At the intersection, read gross weight = 9250 pounds. It must be recognized that if the aircraft is hovered OGE at 9250 pounds using 47.5 psi calibrated torque, there is no reserve power for turns.

5. ANSWER: TAS 106 knots.

IAS 104 knots.

Fuel Flow 655 pounds/hour.

Torque 39 psi.

To determine the desired information, refer to figure 14-7, (CRUISE (page 192 RDB I), and select the chart for 0 degrees centigrade at 4000 feet. Maximum range airspeed is determined from the intersection of the 9500-pound line and the maximum range line. From that point, move left to read TAS = 106 knots; move right to read IAS 104 knots; move up to read fuel flow 655 pounds/hour; and move down to read torque 39 psi.

6. Because of the mission (problem 5) you elect to fly at a true airspeed of 90 knots; what is the indicated airspeed, fuel flow (bleed air ON), and torque required for the flight?

SITUATION: You are the pilot of a UH-1H. You are planning a mission in which a portion of a flight will be conducted NOE.

Planning Information:

Pressure Altitude	2000 feet.
OAT	+20°C.
Engine Calibrated Factor	60.

7. What is the maximum torque available (calibrated and indicated), 30 minute limit), for your aircraft using the information provided above?

Calibrated _____.
Indicated _____.

6. ANSWER: IAS 89 knots.
Fuel flow 555 pounds/hour.
Torque 31 psi.

To determine the desired information, refer to figure 14-7 (RDB, page 192), and select the chart for 0 degrees centigrade at 4000 feet. Enter the chart at 90 knots TAS: move right to intersect the 9500-pound gross weight line. From that point, move right to read IAS 89 knots; move up to read fule flow 555 pounds/hours; move down to read torque 31 psi. Other information that is available from the chart and should be considered is -

a. Maximum endurance and rate-of-climb airspeeds are determined from the intersection of the 9500-pound line and the maximum endurance and R/C line. From that point, move left to read TAS = 63 knots. Note, too, that at this point the torque required is the minimum amount for flight at any airspeed at 9500 pounds gross weight. This indicates that the engine/rotor efficiency is at the optimum at that airspeed.

b. VNE at 9500 pounds is 112 knots TAS (110 knots IAS). Remember that the redline on the airspeed indicator (120 knots for the UH-1H) is not always the airspeed limit. For example, 10,000 feet pressure altitude at 10 degrees centigrade, the aircraft is further restricted to 70 knots IAS when operating with the bleed air on for a continuous period. This is indicated by the line marked CT/BA ON.

c. Note, too, that with the conditions in "b" above, the maximum torque available is 41 psi.

7. ANSWER: calibrated 49
indicated 48

REFERENCE: RDB I, page 185.

8. Using the following information, what is the maximum gross weight (pounds) at which your aircraft will hover out-of-ground effect?

Pressure altitude	1000 feet
OAT	+35 degrees Celsius
Maximum torque available	45 (calibrated)
Wind	Calm

9. On one leg of the flight, you are required to stay on station for 30 minutes as a command-and-control aircraft. Using the following information, what is the best indicated airspeed for maximum endurance; and what is the corresponding fuel flow?

Gross weight	8500 pounds
OAT	0 degrees Celsius
Pressure altitude	4000 feet
Pitot tube	Roof mounted

MAXIMUM ENDURANCE AIRSPEED INDICATED	FUEL FLOW (BLEED AIR ON)
_____	_____

8. ANSWER: 8900 pounds

REFERENCE: RDB I, page 187.

9. ANSWER: 60 KIAS
470 PPH

REFERENCE: RDB I, page 192.

10. Using the following information in planning a flight under instrument conditions in a UH-1H, what is the maximum range indicated airspeed and calibrated torque required for that airspeed?

Pressure altitude	10,000 feet
OAT	-10 degrees Celsius
Pitot tube	Nose-mounted
Gross weight	8000 pounds

MAXIMUM RANGE AIRSPEED (INDICATED)	CALIBRATED TORQUE
_____	_____

10. ANSWER: 83
34

REFERENCE: RDB I, page 192.

FM 1-1

1. Terrain flying of necessity involves flight close to the earth's surface and includes the tactical application of low level, contour and NOE flight techniques as appropriate to the enemy's capability to acquire, track, and engage the aircraft.

2. NOE flight is flight as close to the earth's surface as vegetation or obstacles will permit, while generally following the contours of the earth. airspeed & altitude are varied as influenced by the terrain, weather, ambient light, and enemy situation.

3. Contour flight is characterized by a varying airspeed and a varying altitude as vegetation and obstacles dictate.

4. Low level flight is conducted at a selected altitude. The route is preselected and conforms generally to a straight line and a constant airspeed and indicated altitude.

5. The choice of whether low level, contour, or NOE flight will be used at a specific time and place will be determined primarily by the threat.

FM 1-1

1. ANSWER: engage the aircraft REFERENCE: FM 1-1 (RDB VOL II, page 7.)

2. ANSWER: Airspeed and altitude REFERENCE: FM 1-1 (RDB, VOL II, p. 8.)

3. ANSWER: varying REFERENCE: FM 1-1 (RDB, VOL II, p. 8).

4. ANSWER: indicated altitude REFERENCE: FM 1-1 (RDB, VOL II, p. 8).

5. ANSWER: the threat REFERENCE: FM 1-1 (RDB, VOL II, p. 9.)

6. Time considerations influence the selection of flight techniques. When masking exists which allows contour or low level flight to be flown, either is usually preferable to NOE because more terrain can be flown or greater distance can be covered due to the high speed characteristics of low level and contour flight.

7. It is critical that aviation missions be coordinated with friendly ADA units. Each aviator should be cognizant of the location of ADA units, know ADA criteria for identifying and engagement of targets and insure that onboard IFF equipment is functioning and properly coded.

8. In a high threat environment, a formation's specific shape is defined by terrain, situation and desired degree of control.

9. Light signals and code words should be used to assist in reducing radio communication and in the event of lost communications or radio jamming by the enemy.

10. When moving, a small team of two or three helicopters should normally maintain visual contact so as to return an adequate volume of fire if attacked.

11. To minimize the danger of wire strikes, each aviator should make a detailed map study prior to each flight, specifically to identify and mark wire hazards.

6. ANSWER: sorties can be flown greater distances covered REFERENCE: FM 1-1, (RDB, VOL II, p. 9).

7. ANSWER: IFF equipment REFERENCE: FM 1-1, (RDB, VOL II, p. 15).

8. ANSWER: desired degree of control REFERENCE: FM 1-1, (RDB, VOL II, p. 16).

9. ANSWER: lost communications REFERENCE: FM 1-1, (RDB, VOL II, p. 16).

10. ANSWER: maintain its integrity REFERENCE: FM 1-1, (RDB, VOL II, p. 16).

11. ANSWER: detailed map study REFERENCE: FM 1-1, (RDB, VOL II, p. 30).

12. During post flight inspections, special emphasis should be placed on inspection of rotor blades, bottom fuselage, tail boom and tail rotor for tree strike damage.

13. The highest point of most helicopters is at the rear of the main rotor tip path plane, or the high point of the tail rotor arc.

14. The safest way to cross wires is by overflying them at a pole.

15. In combat, it may be necessary to underfly wires to prevent exposing himself to enemy visual or electronic detection.

16. Minimum clearance requirements for underflying wires for an OH-58 is 20 feet + rotor height.

12. ANSWER: tree strike damage REFERENCE: FM 1-1, (RDB, VOL II, p. 32).

13. ANSWER: tail rotor arc REFERENCE: FM 1-1, (RDB, VOL II, p. 33).

14. ANSWER: overflying REFERENCE: FM 1-1, (RDB, VOL II, p. 32).

15. ANSWER: underfly REFERENCE: FM 1-1, (RDB, VOL II, p. 33).

16. ANSWER: 20 feet + hover height REFERENCE: FM 1-1, RDB, II, p. 33).

FM 1-5

1. Tactical instrument flight is defined as flight under IMC conditions in an area directly affected by the heat.

2. When flying at altitudes of 500 feet or higher above the highest obstacle (AHO), the range of the AN/TRN-30 in the tactical mode with a sixty-foot mast antenna is 85 Km.

3. The first step in planning for a tactical instrument flight is to analyze in order to determine all the requirements that are inherent in it.

4. Elevation data obtained from a map will be the primary input for altimeter setting whenever up-to-date barometric pressure information is not available.

5. To determine the correct compass heading required to maintain the desired true course, use the following formula:

TC ± VAR = MC
MC ± wind draft = MH
MH + DEV = CH

6. Whenever possible, a tactical instrument takeoff should be made on the heading that will maintain the desired course.

FM 1-5

1. ANSWER: directly affected by the threat — REFERENCE: FM 1-5, RDB, II, page 111.

2. ANSWER: 85 km — REFERENCE: FM 1-5, (RDB II, p. 121).

3. ANSWER: analyze the mission — REFERENCE: FM 1-5, (RDB II, p. 123).

4. ANSWER: altimeter settings — REFERENCE: FM 1-5, (RDB, II, p. 124).

5. ANSWER: wind drift — REFERENCE: FM 1-5, (RDB II, p. 125).

6. ANSWER: maintain the desired course — REFERENCE: FM 1-5, (RDB II, p. 132).

7. The approach clearance zone for a spiraling approach should be a square with sides of 4 km when the en route altitude is 600 above highest obstacle.

8. The spiraling approach may be made using FM Homing when either the navaid or onboard ADF becomes unreliable.

7. ANSWER: 600 feet AHO REFERENCE: FM 1-5, (RDB II, p. 141).

8. ANSWER: FM homing REFERENCE: FM 1-5, (RDB II, p. 142).

FM 1-5

PRACTICE PROBLEMS

1. Convert 145 kilometers to nautical miles. _____.

2. What is your groundspeed if you fly a distance of 27 nautical miles in 17 minutes? _____

3. What is the time required to fly 27 nautical miles at a groundspeed of 108 knots? _____

4. What is the time required to fly 4.9 nautical miles at a groundspeed of 80 knots? _____

5. How much fuel is required to fly 2 hours 20 minutes at a consumption rate of 520 pounds per hour? _____

6. Find TAS when CAS is 100 knots at an altitude of 5500 feet and temperature is -5°C. _____

7. When pressure altitude is 4000 feet and temperature is 20°C, what is the density altitude? _____

8. Find true (corrected) altitude when pressure altitude is 6000 feet and temperature is -10°C. _____

9. Given: Course 170°, Wind 050°/20 knots, TAS 105 knots
   Find: Heading _____, Groundspeed _____

10. Given: Course 310°, Wind 280°/15 knots, Groundspeed 95 knots
    Find: Heading _____, TAS _____

11. Given: Track 200°, Groundspeed 95 knots, Heading 210°, TAS 105 knots
    Find: Wind _____

12. Given: Course 150°, Distance 150 nautical miles, Wind 220°/10 knots, Altitude 8000 feet, Temperature -10°C, CAS 95 knots
    Find: ETE _____

ANSWERS:

1. 78
2. 95
3. 15
4. 3 minutes 40 seconds
5. 1210 pounds
6. 107 knots
7. 5500
8. 5725
9. 160° - 114 knots
10. 306° - 108 knots
11. 266°/20 knots
12. 1 hour 27 minutes

IF YOU MISSED ANY OF THESE QUESTIONS OR DESIRE MORE INFORMATION, REFER TO FM 1-5, (RDB II, p. 63-107).

FM 1-30

1. Sequence reports contain the height of the base of each cloud layer measured in hundreds of feet AGL that is indicated by a sky condition contraction.

2. The ceiling is the lowest condition reported as BKN, OVC, or X that is not prefixed by a (—).

3. Visibility is reported in statute miles after the sky condition contraction.

FM 1-30

1. ANSWER: hundreds of feet AGL REFERENCE: FM 1-30, (RDB II, p. 147).

2. ANSWER: minus (-) REFERENCE: FM 1-30, (RDB II, p. 149).

3. ANSWER: statute REFERENCE: FM 1-30, (RDB II, p. 150).

FM 90-1

1. Degrading the effectiveness of enemy combat power for a given period of time defines the principle of combat suppression

2. The use of chaff and smoke will degrade the enemy's capability to optically or electronically acquire your aircraft.

3. For the maximum firepower advantage, the attack helicopter should be integrated into the fire support and battle plan of the combined arms team.

4. Because helicopters have a marked mobility differential over other members of the combined arms team, they provide a means for the commander to rapidly apply troop leverage combat power.

5. Army combat aircraft in forward battle areas must use terrain flying in order to survive.

FM 90-1

1. ANSWER: suppression REFERENCE: FM 90-1, (RDB II, p. 164).

2. ANSWER: optically
electronically REFERENCE: FM 90-1, (RDB II, p. 165).

3. ANSWER: combined arms team REFERENCE: FM 90-1, (RDB II, p. 166).

4. ANSWER: heavy, decisive combat power REFERENCE: FM 90-1, (RDB II, p. 166).

5. ANSWER: terrain flying REFERENCE: FM 90-1, (RDB II, p. 169).

1. Exposure to a flare or a searchlight beam which would normally be for a period in excess of one second could seriously impair the aviator's night vision.

2. A decrease in photopic visual sensitivity, which can persist for as long as 5 hours, will result when an aviator is exposed to intense sunlight for 2 to 5 hours.

3. The wearing of red-lens goggles does not provide as good dark adaption as does complete darkness for 30 - 45 mins.

4. Red lights should be the only source of lighting in the cockpit. The intensity of the cockpit lights should be adjusted to the lowest level which will allow the pilot to interpret the instruments.

5. To insure a better operating environment for aircrew proficiency night missions, the following precautionary measures should be implemented:

   1. Aircraft scheduled for night flight should be positioned on the airfield where [illegible].

   2. Airfield lighting should be reduced to the lowest intensity or turned off.

   3. Departure routes should be selected to avoid highways and residential areas.

TC 1-28

1. ANSWER: 1 second REFERENCE: TC 1-28, (RDB II, p. 192).

2. ANSWER: 2 to 5 hours REFERENCE: TC 1-28, (RDB II, p. 193).

3. ANSWER: complete darkness for 30-45 minutes REFERENCE: TC 1-28, (RDB II, p. 193).

4. ANSWER: allow the pilot to interpret the instruments REFERENCE: TC 1-28, (RDB II, p. 193).

5. ANSWER: the least amount of light exists REFERENCE: TC 1-28, (RDB II, p. 194).

6. If a flash of high intensity light is expected from a specific direction, crewmembers should turn the head away from _____ to minimize exposure to the light source.

7. Without supplemental O2 a measurable decline in night vision is evident at all pressure altitudes in excess of 4000 feet.

8. Aircrews who are exposed to weapon flashes fired from the helicopter can avoid loss of night vision by limiting the duration of time during which the ordinance is expended.

9. The physiological effect of smoking three cigarettes in rapid succession is that the smoker has effectively lost 20% of his night vision capability at sea level.

10. To scan effectively, the aviator must scan from side to side and from top to bottom of the field of view in 10° overlapping movements.

11. Even though off-center vision is practiced, if an object is viewed for a period of time in excess of 2 to 3 sec, the images tend to bleach out and become one solid tone.

6. ANSWER: turn the helicopter

REFERENCE: TC 1-28, (RDB II, p. 194).

7. ANSWER: supplemental oxygen

REFERENCE: TC 1-28, (RDB II, p. 195).

8. ANSWER: ordinance is expended

REFERENCE: TC 1-28, (RDB II, p. 195).

9. ANSWER: 20%

REFERENCE: TC 1-28, (RDB II, p. 196).

10. ANSWER: right to left
top to bottom

REFERENCE: TC 1-28, (RDB II, p. 198).

11. ANSWER: 2 to 3 seconds

REFERENCE: TC 1-28, (RDB II, p. 198).

12. The halo effect that is observed around artificial lights indicates the presence of moisture or other small particles.

13. When hovering with the aid of position lights, a common error is to stare at one point, which tends to induce autokinesis or disorientation.

12. ANSWER: moisture REFERENCE: TC 1-28, (RDB II, p. 213).

13. ANSWER: stare at a single reference on the ground REFERENCE: TC 1-28, (RDB II, p. 225).