NOTE: Text that should be deleted is displayed with a line through it. New text is shown with a blue background.

If you see any additional content on your knowledge test not represented in our materials or this update, please share this information with Gleim so we can continue to provide the most complete knowledge test preparation experience possible. You can submit feedback at www.gleim.com/AviationQuestions. Thank you in advance for your help!

Study Unit 3: Navigation Systems

Page 91, Subunit 3.4, Question 44: These edits clarify the calculations in the answer explanation.

44. Determine the approximate time and distance to a station if a 5° wingtip bearing change occurs in 1.5 minutes with a true airspeed of 95 knots.

    A. 16 minutes and 14.3 NM.
    B. 18 minutes and 28.5 NM.
    C. 18 minutes and 33.0 NM.

    Answer (B) is correct. (IFH Chap 9)

    DISCUSSION: Use the following formulas to compute the time to station:

    Time-Distance Check

    Time Min. to station = \( \frac{60 \times \text{Min. Time (sec.) between bearings}}{\text{Degrees (°) of bearing change}} \)

    \[ 18 \text{ min. to station} = \frac{(60 \times 1.5)}{5} = 18 \text{ min.} 90 \text{ sec.} \]

    Distance from a Station

    \[ \text{TAS (NM/min.)} \times \text{Time (min.)} = \text{Distance to station (NM)} \]

    \[ 95 \text{ kt.} \times 18 \text{ min} = 28.5 \text{ NM from station} \]

    Thus, it is 18 min. to the station, which is less than 1/3 of an hour. One third of 95 is less than 33, and thus must be 28.5 rather than 33.0. On the computer side of your flight computer, put 95 kt. on the outer scale over 60 on the inner scale. Find 18 min. on the inner scale; 28.5 NM is on the outer scale.

    Answer (A) is incorrect. The time is 18 min., not 16 min.
    Answer (C) is incorrect. Eighteen minutes is less than 1/3 hr., and 1/3 of 95 kt. is less than 33 NM.
Study Unit 6: Holding and Instrument Approaches

Page 224, Subunit 6.7, Question 39: These edits improve the answer explanations.

39. If the ILS outer marker is inoperative, you may substitute

A. a compass locator or precision radar.
B. VOR radials that identify the location.
C. Distant Measuring Equipment (DME).

Answer (A) is correct. (14 CFR 91.175)

**DISCUSSION:** A compass locator or precision radar may be substituted for an inoperative outer or middle marker. Compass locators, precision radar, DME, VOR, or nondirectional fixes authorized in the standard instrument approach procedure or surveillance radar may be substituted for an inoperative outer marker.

Answer (B) is incorrect. VOR radials can be substituted for the outer marker but not the middle marker. Answer (C) is incorrect. DME can be substituted for the outer marker, but not the middle marker only if DME is authorized in the standard instrument approach procedure.

Page 226, Subunit 6.8, Question 53: This question was removed because it does not provide enough information to answer the question.

53. (Refer to Figure 133 on page 227.) During a stabilized IMC approach, the pilot should have the aircraft in a landing configuration

A. with engines spooled up before descending below 1,261 ft. MSL.
B. established on the glide slope before descending below 1,791 ft. MSL.
C. descending no greater than 1,000 feet per minute below 1,591 ft. MSL and making bank angles not exceeding 15° below 500 ft. AGL.

Answer (B) is correct. (IPH Chap 4, AC 120-71A)

**DISCUSSION:** An approach should be stabilized before descending below 1,000 feet above the airport of TDZE. Fig. 133 shows a TDZE of 791, meaning you should be configured, stabilized, and established on the glide slope before descending below 1,791 ft. MSL.

Answer (A) is incorrect. There is no requirement to have engines spooled up during an approach, and, in this case, 1,260 units is the decision altitude (DA) for the approach. You should be stabilized and in the landing configuration well before you reach DA on an ILS approach in IMC. Answer (C) is incorrect. Although it is good advice to limit your descent rate and bank angles during an approach, 1,591 ft. MSL is an arbitrary number that has no relevance to this question.

Page 274, Subunit 6.13, Question 152: This question was removed because it does not provide enough information to answer the question.

152. (Refer to Figure 152 on page 275.) You are 27 NM out at 7,000 feet on heading 300° on the RNAV (GPS) RWY 30 approach to LBF approaching AJCIZ. You are cleared for the approach. You should

A. descend to 4,800 feet inbound to AJCIZ, descend to 4,600 feet in the procedure turn, descend to 4,400 feet at BEMXI, and complete the approach.
B. descend to 4,600 feet in the procedure turn at AJCIZ, descend to 4,400 feet at BEMXI, and complete the approach.
C. descend to 4,600 feet, do not perform the procedure turn at AJCIZ, descend to 4,400 feet at BEMXI, and complete the approach.

Answer (C) is correct. (IPH Chap 5)

**DISCUSSION:** Fig. 152 indicates you may descend below 4,800 feet within 30 NM of AJCIZ with no procedure turn when on a heading of 300°. Although there is a possibility you may be asked to hold at AJCIZ, this allows you to descend to 4,600 feet to AJCIZ, then descend to 4,400 feet at BEMXI and complete the approach.

Answer (A) is incorrect. The “NoPT” notation of Fig. 152 translates to “no procedure turn” when arriving on a course between 027° and 207°, which you are. It also notes in the profile that you can descend to 4,600 feet, not 4,800 feet, when inside 30 NM of AJCIZ. Answer (B) is incorrect. The “NoPT” notation of Fig. 152 translates to “no procedure turn” when arriving on a course between 027° and 207°. You are arriving on a course of 300°.
Page 284, Subunit 6.13, Question 164: These edits were made to reflect sample exams released by the FAA.

164. (See Figure 230 below.) The minimum safe altitude (MSA) for the VOR/DME or GPS-A at 7D3 is geographically centered at **on** what position?

A. **DEANI** intersection.
B. **WHITE CLOUD** VOR/DME.
C. **MAJUB** intersection Baldwin Municipal Airport.

Answer (B) is correct. *(AIM Para 5-4-5)*

**DISCUSSION:** Minimum safe altitudes provide obstacle clearance within 25 NM of the specified navigational facility. In Fig. 230, the MSA circle specifies WHITE CLOUD VOR/DME.

Answer (A) is incorrect. **DEANI** intersection is the point of descent to the final approach fix. Answer (C) is incorrect. An MSA will **always normally** be based on a navigation facility or a waypoint (GPS or RNAV approach), not an intersection the airport.

Page 308, Subunit 6.15, Question 205: This edit corrects the question source.

205. (Refer to Figure 249 on page 309.) Which type of waypoint is the AGHAN fix?

A. Computer navigation fix (CNF).
B. Fly-over waypoint.
C. Fly-by waypoint.

Answer (C) is correct. *(AIM Para 1-1-18 1-2-1)*

**DISCUSSION:** The AGHAN waypoint is not contained within a circle. This indicates a fly-by waypoint.

Answer (A) is incorrect. CNFs are points used to define the navigational track for an airborne computer system. These include unnamed DME fixes, beginning and ending points of DME arcs, and sensor final approach fixes on some GPS overlay approaches. Answer (B) is incorrect. A fly-over waypoint is symbolized by a waypoint symbol contained within a circle. RW30 is a fly-over waypoint. AGHAN’s symbology does not include that circle, so it is a fly-by waypoint.

**Study Unit 8: Aviation Weather**

Page 347, Subunit 8.7, Question 104: These edits improve the question and better reflect AC 91-74B.

104. On the initial climbout after takeoff with the autopilot engaged, you encounter icing conditions. In this situation, it is recommended that

A. the airspeed mode be disconnected you trust that the autopilot will safely handle the icing situation.
B. the vertical speed mode be disconnected.
C. the autopilot be set to maintain a specific attitude the vertical speed mode remain engaged.

Answer (B) is the best answer. *(AC 91-74A B)*

**DISCUSSION:** While the pilot should strongly consider disengaging the autopilot altogether, workload permitting, the vertical speed mode should definitely be disconnected to prevent stalls due to ice accumulation. Extreme vigilance should be exercised while climbing with the autopilot engaged. Climbing in vertical speed (VS) mode in icing conditions is highly discouraged. When climbing with the autopilot engaged in the vertical speed mode, ice accretion will result in a loss of climb performance. If the vertical speed is not reduced, the autopilot will maintain the rate until stall. It is critical that the pilot monitor airspeed to assure that the aircraft maintains at least the minimum flight speed for the configuration and environmental conditions.

Answer (A) is incorrect. While most general aviation autopilots do not feature an airspeed hold mode, this mode is less dangerous than vertical speed hold. However, operation in airspeed hold mode should also be discontinued in icing conditions. **Extreme vigilance should be exercised while climbing with the autopilot engaged.** Answer (C) is incorrect. It is not safe to stop a climb during takeoff, especially considering obstacles and terrain. In addition, there is less chance of exiting the icing conditions at an altitude where there is known ice accumulation. Climbing in vertical speed (VS) mode in icing conditions is highly discouraged. When climbing with the autopilot engaged in the vertical speed mode, ice accretion will result in a loss of climb performance. If the vertical speed is not reduced, the autopilot will maintain the rate until stall.
Please change all AC 91-74A sources to AC 91-74B (Questions 77, 78, 81, 90, 91, 92, 93, 96, and 98 through 115).

Study Unit 9: Aviation Weather Services

Page 373, Subunit 9.6, Question 27: These edits were made to reflect sample exams released by the FAA.

27. "WND" in the categorical outlook in the Aviation Area Forecast means that the __surface wind speed__ during that period is forecast to be

   A. Sustained surface wind speed of 6 at 25 knots or greater.
   B. Sustained surface wind speed of 15 gusting at 20 knots or greater.
   C. Sustained surface wind speed of at 20 knots or greater.

   Answer (C) is correct. (AWS Sect 7)

   DISCUSSION: WND in the categorical outlook in the aviation area forecast (FA) means that the winds, sustained or gusty, are expected to be 20 kt. or greater during that period. The contraction "WND" is appended to any category if the sustained surface wind is expected to be 20 kt. or more or surface wind gusts are expected to be 25 kt. or more during the majority of the 6-hr. outlook period.

   Answer (A) is incorrect. WND means the winds are expected to be at least 20 kt., not 6kt., or stronger. "WND" means the winds are expected to be at least 20 kt. or greater, not 25 kt. or greater. Answer (B) is incorrect. WND means the winds are expected to be at least 20 kt., not 15 kt., or stronger. "WND" means the surface wind gusts are expected to be 25 kt. or greater, not gusting at 20 kt or greater.

Page 388, Subunit 9.11, Question 70: This edit removes an incorrect figure reference.

70. (Refer to Figure 12 below, and Figure 20 on page 389.) What is the height of the tropopause over Kentucky?

   A. FL 300 sloping to FL400 feet MSL.
   B. FL 340.
   C. FL 390.

   Answer (B) is correct. (AWS Sect 8)

   DISCUSSION: Over the state of Kentucky is a five-sided polygon which has 340 over a letter "L." This indicates a low tropopause height of 34,000 ft. The chart legend states "All heights in flight level."

   Answer (A) is incorrect. The area enclosed by a dashed line centered over Virginia, not Kentucky, is forecasting an area of moderate clear air turbulence (CAT) from FL 300 to FL 400, not a sloping tropopause. Answer (C) is incorrect. FL 390 is the height of the tropopause surrounding Kentucky (indicated by numerous occurrences of "FL 390" inside rectangles), not over Kentucky, where a low tropopause height of FL 340 is indicated by "FL 340 L" inside a five-sided polygon.

Study Unit 10: IFR En Route

Page 407, Subunit 10.3, Question 49: This edit makes the correct answer choice more accurate.

49. (Refer to Figure 89 on page 425.) What VHF frequencies are available for communications with Cedar City FSS?

   A. 123.6, 121.5, 108.6, and 112.8.
   B. 122.2, 121.5, 122.6, and 112.1.
   C. 122.2, 121.5, 122.0, and 123.6.

   Answer (B) is correct. (ACL)

   DISCUSSION: Cedar City communication box (left center of Fig. 89) is a shadow box, which indicates an FSS. On top of the box is frequency 122.6. Additionally, VHF frequencies 122.2 and 121.5 are available at all FSSs.

   Frequency 122.1 is used by pilots to contact Cedar City FSS in the vicinity of Milford (MLF), and the FSS would transmit (pilots receive) on the MLF VORTAC frequency 112.1.

   Answer (A) is incorrect. The figure of 123.6 is not listed above any communication boxes controlled by Cedar City FSS and both CDC and BCE VORTACs are underlined, which means there is no voice on that frequency. Answer (C) is incorrect. The figures of 122.0 and 123.6 are not listed above any communication boxes controlled by Cedar City FSS.
Study Unit 11: IFR Flights

Page 456, Subunit 11.3, Question 36: This edit improves and clarifies the correct answer explanation with step-by-step math.

36. (Refer to Figure 188 on page 457.) With a ground speed of 120 knots, approximately what minimum rate of descent will be required between I-GPO 7.3 DME fix (HUDUT) and the I-GPO 4.1 DME fix?

A. 320 fpm.
B. 740 fpm.
C. 510 fpm.

Answer (B) is correct. *(IPH Chap 3)*

**DISCUSSION:** To solve this problem, you need to know the distance to be traveled between the two fixes and the amount of altitude that must be lost. You also need to know how long it will take your aircraft to cover that distance. The distance to be traveled is 3.2 NM (7.3 – 4.1 = 3.2). The amount of altitude that must be lost is 1180 feet, descending from 2,300 feet at 7.3 DME to 1,120 feet at 4.1 DME (2,300 – 1,120 = 1,180 feet). With a ground speed of 120 knots, you can calculate the time available. 3.2 NM ÷ 120 knots = 0.026 hours, which you can round to 1.6 minutes. 0.026 hours × 60 (minutes per hour) = 1.5999 minutes, which you can round to 1.6 minutes. 1180 feet ÷ 1.6 minutes = 737.5 feet per minute. The closest available answer is 740 feet per minute.

Answer (A) is incorrect. The descent rate of 320 feet per minute is less than half of what you would need to reach the 4.1 DME fix at the correct altitude. Answer (C) is incorrect. A descent rate of 510 feet per minute is insufficient to reach the 4.1 DME fix at the correct altitude.
52. (Refer to Figure 32 on page 469, Figure 33 on page 468, Figure 34 on page 416, Figure 35 on page 472, Figure 35A on page 473, and Figure 36 on page 468.) (Refer to the FD excerpt below, and use the wind entry closest to the flight planned altitude.) Determine the time to be entered in block 10 of the flight plan.

Route of flight .......... Figures 32, 33, 34, 35, 35A, & 36
Flight log & MAG VAR .............................................. Figure 33
RNAV RWY 33 & Excerpt from AFD ..... Figs. 36A & 36

<table>
<thead>
<tr>
<th>FT</th>
<th>3000</th>
<th>6000</th>
<th>9000</th>
<th>12000</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAL</td>
<td>2027</td>
<td>2239+13</td>
<td>2240+08</td>
<td>2248+05</td>
</tr>
</tbody>
</table>

A. 1 hour 35 minutes.
B. 1 hour 41 minutes.
C. 1 hour 46 minutes.

Answer (C) is correct. (IFH Chap 10)

**DISCUSSION:** To determine the estimated time en route to be entered in block 10, you must complete the flight planning log in Fig. 33. As you compare the flight log with the en route and arrival charts (Figs. 34, 35, and 35A), it will become apparent to you that some alterations of the flight log are necessary. On V573 (Fig. 34), there is a bend in the airway (COP) 10 NM southwest of MARKI INT., so an additional leg is required to accurately compute groundspeeds. Also, the check points in the STAR (Figs. 35 and 35A) are not labeled well in the flight log.

Having corrected the flight log as shown below, use the wind side of your flight computer to determine groundspeeds as shown. Remember that winds are given in true direction and must be converted to magnetic. Fig. 33 shows a variation of 4°E. Use the wind at 9,000 ft. (which is closest to the planned altitude of 8,000 ft.): 220° – 4°E var. = 216° at 40 kt.

<table>
<thead>
<tr>
<th>Distance</th>
<th>MC</th>
<th>Wind (Mag)</th>
<th>Ground-speed</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARKI INT.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>:12:00G</td>
</tr>
<tr>
<td>VOR COP</td>
<td>10</td>
<td>221°</td>
<td>216/40</td>
<td>140</td>
</tr>
<tr>
<td>TXK VORTAC</td>
<td>45</td>
<td>210°</td>
<td>216/40</td>
<td>140</td>
</tr>
<tr>
<td>CONNY INT</td>
<td>61</td>
<td>272°</td>
<td>216/40</td>
<td>154</td>
</tr>
<tr>
<td>BUJ VORTAC</td>
<td>59</td>
<td>239°</td>
<td>216/40</td>
<td>142</td>
</tr>
<tr>
<td>WEDER INT</td>
<td>24</td>
<td>215°</td>
<td>216/40</td>
<td>140</td>
</tr>
<tr>
<td>Approach and Landing</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>:10:00G</td>
</tr>
</tbody>
</table>

G = Given

Answer (A) is incorrect. An ETE of 1 hr. 35 min. does not take into account the flight time from the BUJ VORTAC to WEDER INT as explained in the STAR (Figs. 35 and 35A). Answer (B) is incorrect. An ETE of 1 hr. 41 min. requires a TAS of approximately 165 kt., not 180 kt.