6. Which statement is true concerning primary flight controls?

A. The effectiveness of each control surface increases with speed because there is more airflow over them.

B. Only when all three primary flight controls move in sequence do the airflow and pressure distribution change over and around the airfoil.

C. Primary flight controls include ailerons, rudder, elevator, and trim systems.

Answer (A) is correct. (PHAK Chap 5)

DISCUSSION: Rudder, aileron, and elevator effectiveness increase with speed because there is more airflow over the surface of the control device. Answer (B) is incorrect. Movement of any primary flight control surface changes the airflow and pressure distribution over and around the airfoil. Answer (C) is incorrect. The primary flight controls do not include trim systems; these are considered secondary flight controls.

Study Unit 2 – Airplane Instruments, Engines, and Systems

Page 56, Subunit 2.8, Question 52: This FAA question was removed from our database because none of the answers is clearly correct.

52. The heading indicator operates off of

A. DC voltage.

B. AC voltage.

C. Vacuum.

Answer (C) is correct. (PHAK Chap 7)

DISCUSSION: The heading indicator operates off of vacuum from the engine-driven vacuum pump (also known as a suction pump). Answer (A) is incorrect. The turn coordinator requires DC voltage. Answer (B) is incorrect. AC voltage is found on larger aircraft, not on small airplanes. The heading indicator illustrated operates off of the aircraft’s engine-driven vacuum pump.
Study Unit 3 – Airports, Air Traffic Control, and Airspace

Page 84, Subunit 3.2, Question 12: This edit updates the source material for the correct answer.

12. The ‘yellow demarcation bar’ marking indicates
   A. runway with a displaced threshold that precedes the runway.
   B. a hold line from a taxiway to a runway.
   C. the beginning of available runway for landing on the approach side.

Answer (A) is correct. *(AIM Para 2-3-63, AIM Fig 2-3-6)*

**DISCUSSION:** A demarcation bar is a 3-ft.-wide yellow stripe that separates a runway with a displaced threshold from a blast pad, stopway, or taxiway that precedes the runway.

Answer (B) is incorrect. A set of solid yellow and dashed yellow lines represents the hold lines between a taxiway and runway. Answer (C) is incorrect. The yellow demarcation bar delineates the beginning of the displaced threshold, which is not a landing surface.

Page 101, Subunit 3.10, Question 82: This edit updates the source material for the correct answer.

82. The radius of the procedural outer area of Class C airspace is normally
   A. 10 NM.
   B. 20 NM.
   C. 30 NM.

Answer (B) is correct. *(AIM Chap 3 Para 3-2-4)*

**DISCUSSION:** A 20-NM radius procedural outer area surrounds the primary airport in Class C airspace. This area is not charted and generally does not require action from the pilot.

Answer (A) is incorrect. Each Class C airspace is individually tailored to the specific area; however, most Class C airspace consists of a charted 5-NM radius core area that extends from the surface to 4,000 ft. AGL and a charted 10-NM radius shelf that extends from 1,200 ft. AGL to 4,000 ft. AGL. Answer (C) is incorrect. A 30-NM outer area does not surround Class C airspace; however, a 30-NM Mode C veil does surround Class B airspace.

Study Unit 4 – Federal Aviation Regulations

Page 126, Subunit 4.1, Question 1: This edit reflects changes in a recently released FAA sample exam.

1. With respect to the certification of airmen, which is a category of aircraft?
   A. Gyroplane, helicopter, airship, free balloon.
   B. Airplane, rotorcraft, glider, light-than-air.

Answer (B) is correct. *(14 CFR 1.1)*

**DISCUSSION:** Category of aircraft, as used with respect to the certification, ratings, privileges, and limitations of airmen, means a broad classification of aircraft. Examples include airplane, rotorcraft, glider, and lighter-than-air.

Answer (A) is incorrect. Gyroplane, helicopter, airship, and free balloon are classes (not categories) used with respect to the certification of airmen. Answer (C) is incorrect. Single-engine land and sea and multiengine land and sea are classes (not categories) used with respect to the certification of airmen.
185. A 100-hour inspection was due at 3302.5 hours. The 100-hour inspection was actually done at 3309.5 hours. When is the next 100-hour inspection due?

A. 3312.5 hours.
B. 3402.5 hours.
C. 3395.5 hours.

Answer (B) is correct. (14 CFR 91.409)

DISCUSSION: Since the 100-hr. inspection was due at 3302.5 hr., the next 100-hr. inspection is due at 3402.5 hr. (3302.5 + 100). The 100-hr. limitation may be exceeded by not more than 10 hr. while en route to reach a place where the inspection can be done; the excess time used before the 100-hr. inspection was done must be included in computing the next 100 hr. of time in service.

Answer (A) is incorrect. This is the latest time on the tachometer the last 100-hr. inspection could have been completed, not when the next 100-hr. inspection is due. Answer (C) is incorrect. This is only 86 hours. There are still 14 hours left before the 100-hour inspection is to be done. Adding the remaining 93 hr. to when the last 100-hour inspection was due at 3302.5 hr. (3302.5 + 93 = 3395.5) is incorrect. The next 100-hr. inspection is due at 3402.5 hr. (3302.5 + 100 = 3402.5).

Study Unit 5 – Airplane Performance and Weight and Balance

Page 208, Subunit 5.9, Question 53: This edit corrects a mathematical error.

53. (Refer to Figure 35 on page 209.) Calculate the moment of the airplane and determine which category is applicable.

<table>
<thead>
<tr>
<th>WEIGHT (LB)</th>
<th>MOM/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empty weight</td>
<td>1,350</td>
</tr>
<tr>
<td>Pilot and front passenger</td>
<td>310</td>
</tr>
<tr>
<td>Rear passengers</td>
<td>96</td>
</tr>
<tr>
<td>Fuel, 38 gal.</td>
<td>---</td>
</tr>
<tr>
<td>Oil, 8 qt.</td>
<td>---</td>
</tr>
</tbody>
</table>

A. 79.2, utility category.
B. 80.8, utility category.
C. 81.2, normal category.

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

DISCUSSION: First, total the weight and get 1,999 lb. Note that the 38 gal. of fuel weights 228 lb. (38 gal. × 6 lb./gallon).

Find the moments for the pilot and front seat passengers, rear passengers, and fuel by using the loading graph in Fig. 35. Find the oil weight and moment by consulting Note 2 on Fig. 35. It is 15 lb. and −0.2 moments. Total the moments as shown in the schedule below.

Now refer to the center of gravity moment envelope. Find the gross weight of 1,999 on the vertical scale, and move horizontally across the chart until intersecting the vertical line that represents the 80.8 moment. Note that a moment of 80.8 lb.-in. falls into the utility category envelope.

<table>
<thead>
<tr>
<th>Weight (lb.)</th>
<th>Moment/1000 (lb.-in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empty weight</td>
<td>1,350</td>
</tr>
<tr>
<td>Pilot and front passenger</td>
<td>310</td>
</tr>
<tr>
<td>Rear passengers</td>
<td>96</td>
</tr>
<tr>
<td>Fuel (38 gal. × 6 lb./gal.)</td>
<td>228</td>
</tr>
<tr>
<td>Oil</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>1,999</td>
</tr>
</tbody>
</table>

Answer (A) is incorrect. A moment of 79.2 is 1.6 less than the correct moment of 80.8 pound-inches. Answer (C) is incorrect. The moment of the oil must be subtracted, not added.
61. (Refer to Figure 33 on page 217 and Figure 34 on page 217.)

With the airplane loaded as follows, what action can be taken to balance the airplane?

- Front seat occupants: 411 lb
- Rear seat occupants: 100 lb
- Main wing tanks: 44 gal

A. Fill the auxiliary wing tanks.
B. Add a 100-pound weight to the baggage compartment.
C. Transfer 10 gallons of fuel from the main tanks to the auxiliary tanks.

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

**DISCUSSION:**
You need to calculate the weight and moment of the loaded airplane. The weight of the empty plane, including oil, is 2,015 lb, with a moment of 1,554. The 411 lb. in the front seats has a total moment of 349.35 \[11 \times 35 (ARM) = 34,935 \div 100 = 349.35\]. The rear seat occupants have a weight of 100 lb. and a moment of 121.0 \[100 \times 121 (ARM) = 12,100 \div 100 = 121.0\]. The fuel weight is given on the chart as 264 lb. with a moment of 198.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Moment/100</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb.</td>
<td>lb.-in.</td>
</tr>
<tr>
<td>Empty weight</td>
<td>2,015</td>
</tr>
<tr>
<td>Front seat</td>
<td>411</td>
</tr>
<tr>
<td>Rear seat</td>
<td>100</td>
</tr>
<tr>
<td>Fuel</td>
<td>264</td>
</tr>
<tr>
<td>Loaded Airplane</td>
<td>2,790</td>
</tr>
</tbody>
</table>

On the Fig. 34 chart, the minimum acceptable moment/100 range for 2,790 lb. is 2,243 to 2,374. Thus, the CG of 2,222.35 is forward. Evaluate A, B, and C to see which puts the CG within limits of the acceptable moment/100 range.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Moment/100</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb.</td>
<td>lb.-in.</td>
</tr>
<tr>
<td>A Loaded airplane</td>
<td>+114</td>
</tr>
<tr>
<td>B Baggage</td>
<td>+100</td>
</tr>
<tr>
<td>C New loaded airplane</td>
<td>+60</td>
</tr>
<tr>
<td></td>
<td>-45</td>
</tr>
</tbody>
</table>

This answer is correct because at 2,890 lb. (2,790 + 100), and a moment/100 of 2,362.35 (2,222.35 + 140), the new loaded airplane is over the minimum within the acceptable moment/100 range of 2,354 to 2,452.

Answer (A) is incorrect. At 2,904 lb. (2,790 + 114), the calculated and a moment/100 of 2,329.35 (2,222.35 + 107), does not reach the minimum required the new loaded airplane is forward of the acceptable moment/100 of 2,370 for that weight range of 2,370 to 2,463.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Moment/100</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb.</td>
<td>lb.-in.</td>
</tr>
<tr>
<td>Loaded airplane</td>
<td>2,790</td>
</tr>
<tr>
<td>Fill aux wing tanks</td>
<td>114</td>
</tr>
<tr>
<td>New loaded airplane</td>
<td>2,904</td>
</tr>
</tbody>
</table>

Answer (C) is incorrect. At 2,790 lb., an increase of 11 (2,790 + 0) and a moment/100 does not reach the minimum of 2,243 of 2,233.35 (2,222.35 + 11), the new loaded airplane is forward of the acceptable moment/100 range of 2,243 to 2,374.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Moment/100</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb.</td>
<td>lb.-in.</td>
</tr>
<tr>
<td>Loaded airplane</td>
<td>2,790</td>
</tr>
<tr>
<td>Transfer 10 gallons</td>
<td>0</td>
</tr>
<tr>
<td>New loaded airplane</td>
<td>2,790</td>
</tr>
</tbody>
</table>
Study Unit 8 – Aviation Weather Services

Page 256, Subunit 8.8: These edits remove references to the discontinued Flight Watch frequency, 122.0 MHz.

8.8 **FLIGHT WATCH IN-FLIGHT WEATHER**

1. Flight Watch Service Stations (FSSs) provide weather advisories on 122.02 MHz below FL 180.
   a. Generally, service is available from 6 a.m. to 10 p.m. local time.
   b. Flight Watch FSS provides information regarding actual weather and thunderstorm activity along a proposed route.

Page 270, Subunit 8.8, Questions 46, 47, and 48: These edits remove references to the discontinued Flight Watch frequency, 122.0 MHz.

8.8 **Flight Watch In-Flight Weather**

46. How should contact be established with a Flight Watch Service Station, and what service would be expected?

   A. Call Flight Watch Service on 122.2 for routine weather, current reports on hazardous weather, and altimeter settings.

   B. Call flight assistance on 122.5 for advisory service pertaining to severe weather.

   C. Call Flight Watch Service on 122.0 for information regarding actual weather and thunderstorm activity along proposed route.

   **Answer (C) is correct. (AIM Para 7-1-5)**

   **DISCUSSION:** The frequency designed for en route flight advisories calling Flight Watch is 122.0 MHz. It is designed to provide en route aircraft with timely and meaningful weather advisories during the route. It is not for complete briefings or random weather reports. You would call FSS on 122.2 MHz for routine weather, current reports on hazardous weather, and altimeter settings.

   Answer (A) is incorrect. You would call FSS (not Flight Watch) on 122.2 MHz for routine weather, current reports on hazardous weather, and altimeter settings.

   Answer (B) is incorrect. Answer (C) is incorrect. You would possibly call FSS (not Flight Watch) on 122.52 MHz for advisory service pertaining to severe weather. Answer (C) is incorrect. You would call FSS on 122.2 MHz, not 122.0 MHz.

47. What service should a pilot normally expect from Flight Watch Service?

   A. Actual weather information and thunderstorm activity along the route.

   B. Preferential routing and radar vectoring to circumnavigate severe weather.

   C. Severe weather information, changes to flight plans, and receipt of routine position reports. Local information about restaurants, hotels, and rental car services.

   **Answer (A) is correct. (AIM Para 7-1-5)**

   **DISCUSSION:** Flight Watch Service is designed to provide en route traffic with timely and meaningful weather advisories pertinent to the type of flight intended. It is designed to be a continuous exchange of information on winds, turbulence, visibility, icing, etc., between pilots and Flight Watch Service specialists on the ground.

   Answer (B) is incorrect. Preferential routing and radar vectoring is provided by approach control and ATC center.

   Answer (C) is incorrect. Changes to flight plans and routine position reports should be given to an FSS. Local information can be obtained from a Fixed Base Operator (FBO) or various online and directory services.

48. Below FL 180, en route weather advisories should be obtained from an FSS on

   A. 122.02 MHz.

   B. 122.1 MHz.

   C. 123.6 MHz.

   **Answer (A) is correct. (AIM Para 7-1-5)**

   **DISCUSSION:** Below FL 180, to receive weather advisories along your route, you should contact Flight Watch Service on 122.02 MHz.

   Answer (B) is incorrect. This is the pilot-to-FSS frequency used on duplex remote communication facilities.

   Answer (C) is incorrect. This is the common FSS frequency for airport advisory service.
Page 272, Subunit 8.10, Question 58: This edit clarifies the correct answer explanation.

58. (Refer to Figure 20 on page 273.) At what altitude is the freezing level over the middle of Florida on the 12-hour Significant weather prognostic chart?

A. 4,000 feet.
B. 8,000 feet.
C. 12,000 feet.

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

DISCUSSION: Refer to the upper left panel of the Significant weather prognostic chart in Fig. 20. On prog charts, the freezing level is indicated by a dashed line, with the height given in hundreds of feet MSL. In Fig. 20, there is a dashed line across the middle of Florida, marked with "120" just off the coast. This signifies that the freezing level is 12,000 ft. MSL.

Answer (A) is incorrect. The freezing level is at 4,000 ft. MSL across the northern U.S. and Canada, not over the middle of Florida. Answer (B) is incorrect. The freezing level is at 8,000 ft. MSL extending from southern California, upward and across the northern U.S., and into New Jersey, not over the middle of Florida.

Study Unit 9 – Navigation: Charts and Publications

Page 284, Subunit 9.4, 2.: These edits remove references to the discontinued Flight Watch frequency, 122.0 MHz.

2. Flight Watch Service Stations (FSSs) specifically provide en route aircraft with current weather along their route of flight.
   a. Flight Watch Service is available throughout the country on 122.0 between 5,000 ft. MSL and 18,000 ft. MSL 122.2 MHz or the frequencies listed on aeronautical charts and the Airport/Facility Directory.
   b. The name of the nearest Flight Watch FSS facility is sometimes indicated in communications boxes.

Page 312, Subunit 9.2, Question 19: This edit clarifies the question to better match Figure 22.

19. (Refer to Figure 22 on page 313.) The terrain elevation of the light tan (light colored) area between Minot (area 1) and Audubon Lake (area 2) varies from

A. sea level to 2,000 feet MSL.
B. 2,000 feet to 2,500 feet MSL.
C. 2,000 feet to 2,700 feet MSL.

Answer (B) is correct. (ACL)

DISCUSSION: The requirement is the terrain elevation in the tan area between 1 and 2 in Fig. 22. The tan area indicates terrain between 2,000 ft. and 3,000 ft. The elevation contours on sectionals vary by 500 ft. increments. The 2,000 ft. contour line is located where the color changes from light green to light tan. Since there is no other contour line in the light tan area, the terrain elevation is between 2,000 ft. and 2,500 ft. MSL. Also, Poleschook Airport (halfway between 1 and 2) indicates an elevation above MSL of 2,245.

Answer (A) is incorrect. The light tan area indicates terrain elevation from 2,000 ft. to 3,000 ft. MSL, not from sea level to 2,000 ft. MSL. Answer (C) is incorrect. Elevation contours vary by 500 ft., not 700 ft.
Page 346, Subunit 9.4, Question 67: These edits remove references to the discontinued Flight Watch frequency, 122.0 MHz.

67. (Refer to Figure 22 on page 347.) On what frequency can a pilot receive Hazardous Inflight Weather Advisory Service (HIWAS) in the vicinity of area 1?

A. 117.1 MHz.
B. 118.0 MHz.
C. 122.0 MHz.

Answer (A) is correct. (ACL)

DISCUSSION: On Fig. 22, 1 is on the upper left and the Minot VORTAC information box is 1 in. below 1. Availability of Hazardous Inflight Weather Advisory Service (HIWAS) will be indicated by a circle which contains an "H," found in the upper right corner of a navigation frequency box. Note that the Minot VORTAC information box has such a symbol. Accordingly, a HIWAS can be obtained on the VOR frequency of 117.1. Notice the 1 before 17.1 is truncated by the excerpt. VOR frequencies all begin with a 1, so a 1 can be inferred.

Answer (B) is incorrect. "Ch 118" in the Minot VORTAC information box refers to the TACAN channel (the military equivalent of VOR/DME). Answer (C) is incorrect. The universal frequency for Flight Watch Service is 122.02.

Page 354, Subunit 9.4, Questions 77 and 78: These edits remove references to the discontinued Flight Watch frequency, 122.0 MHz.

77. (Refer to Figure 27 on page 355.) (Refer to area 4.) The CTAF/UNICOM frequency at Jamestown Airport is

A. 122.02 MHz.
B. 123.0 MHz.
C. 123.6 MHz.

Answer (B) is correct. (ACL)

DISCUSSION: The UNICOM frequency is printed in bold italics in the airport identifier. At Jamestown it is 123.0 MHz. The C next to it indicates it as the CTAF.

Answer (A) is incorrect. This is Flight Watch Service frequency, not UNICOM. Answer (C) is incorrect. This is an FSS frequency, not UNICOM.

78. (Refer to Figure 27 on page 355.) (Refer to area 5.) What is the CTAF/UNICOM frequency at Barnes County Airport?

A. 122.02 MHz.
B. 122.8 MHz.
C. 123.6 MHz.

Answer (B) is correct. (ACL)

DISCUSSION: In Fig. 27, Barnes County Airport is to the west of area 5. The CTAF at Barnes County Airport is marked as the UNICOM frequency for the airport, i.e., 122.8.

Answer (A) is incorrect. This is Flight Watch Service. Answer (C) is incorrect. This is an FSS frequency.
Study Unit 11 – Cross-Country Flight Planning

Page 408, Subunit 11.6, Question 31: This edit corrects the magnetic course in the correct answer explanation.

31. (Refer to Figure 23 on page 409.) What is the magnetic heading for a flight from Priest River Airport (area 1) to Shoshone County Airport (area 3)? The wind is from 030° at 12 knots and the true airspeed is 95 knots.

A. 121°.
B. 143°.
C. 136°.

Answer (A) is correct. (PHAK Chap 15)

**DISCUSSION:** On Fig. 23, begin by computing the true course from Priest River Airport (upper left corner) to Shoshone County Airport (just below 3) by laying a flight plotter between the two airports. The grommet should coincide with the meridian (vertical line with cross-hatchings). Note the 143° true course on the edge of the protractor.

Next, find the magnetic variation that is given by the dashed line marked 15°E, slanting in a northeasterly fashion just south of Carlin Bay Private Airport. Subtract the 15°E variation from TC to obtain a magnetic course of 128°. Since the wind is given true, reduce the true wind direction of 030° by the magnetic variation of 15°E to a magnetic wind direction of 15°.

Now use the wind side of your computer. Turning the inner circle to 15° under the true index, mark 12 kt. above the grommet. Set the magnetic course of 128° under the true index. Slide the grid so the pencil mark is on 95 kt. TAS. Note that the pencil mark is 7° left of the center line, requiring you to adjust the magnetic course to a 121° magnetic heading (128° - 7°). Subtract left, add right. That is, if you are on an easterly flight and the wind is from the north, you will want to correct to the left.

Answer (B) is incorrect. This is the true course, not the magnetic heading. Answer (C) is incorrect. This would be the magnetic heading if the wind was from 215° at 19 kt., not 030° at 12 kt.

Appendix A – Private Pilot Practice Test

Page 434, Question 45: This edit reflects changes in a recently released FAA sample exam.

45. With respect to the certification of airmen, which is a category of aircraft?

A—Gyroplane, helicopter, airship, free balloon.
B—Airplane, rotorcraft, glider, light-than-air.