With the following changes, this text provides complete preparation for the computerized FAA Ground, Flight and Sport Instructor, Fundamentals of Instructing, and Designated Pilot Examiner Knowledge Exams. The FAA may rearrange the answer stems to appear in a different order on your test than you see in this book. For this reason, be careful to fully understand the intent of each question and corresponding answer while studying, rather than memorize the A, B, C associated with the correct response. The FAA is expected to release a new test database in February 2009.

Page Number	Question Number	Correct Answer	Explanation
2-3	7283	[A]	*A new question is added to read:* AIR, GLI, LSA, WSC, PPC **7283.** Action of the elevators moves the plane on its A—lateral axis. B—longitudinal axis. C—vertical axis. The elevators rotate the plane about its lateral axis to produce pitch. (PLT095) — FAA-H-8083-25 Answer (B) is incorrect because ailerons move the plane on its longitudinal axis. Answer (C) is incorrect because rudders move the plane on its vertical axis.
2-3	7284	[B]	*A new question is added to read:* AIR, GLI, LSA, WSC, PPC **7284.** Action of the ailerons moves the plane on its A—lateral axis. B—longitudinal axis. C—vertical axis. The ailerons rotate the plane about its longitudinal axis to produce roll. (PLT095) — FAA-H-8083-25 Answer (A) is incorrect because elevators move the plane on its lateral axis. Answer (C) is incorrect because rudders move the plane on its vertical axis.
2-3	7285	[A]	*A new question is added to read:* AIR, LSA **7285.** If the pilot applies right rudder to a stable airplane, the A—tail deflects right and the nose moves right. B—tail deflects left and the nose moves right. C—tail deflects right and the nose moves left. When pressure is applied to the right rudder pedal, the tail deflects right and the airplane's nose moves (yaws) to the right in relation to the pilot. (PLT244) — FAA-H-8083-25
3-7	7282	[A]	*A new question is added to read:* ALL **7282.** What is true altitude? A—The vertical distance of the aircraft above sea level. B—The vertical distance of the aircraft above the surface. C—The height above the standard datum plane. True altitude is the vertical distance of the airplane above sea level — the actual altitude. It is often expressed as feet above mean sea level (MSL). Airport, terrain, and obstacle elevations on aeronautical charts are true altitudes. (PLT023) — FAA-H-8083-25 Answer (B) is incorrect because the vertical distance above the surface is absolute altitude. Answer (C) is incorrect because the height above the standard datum plane is pressure altitude.

Page Number	Question Number	Correct Answer	Explanation
3-7	7288	[B]	*A new question is added to read:* ALL **7288.** What is absolute altitude? A—The altitude read directly from the altimeter. B—The vertical distance of the aircraft above the surface. C—The height above the standard datum plane. Absolute altitude is height above the surface. This height may be indicated directly on a radar altimeter. Absolute altitude may be approximately computed from indicated altitude and chart elevation data. (PLT023) — FAA-H-8083-25 Answer (A) is incorrect because the altitude read from the altimeter is indicated altitude. Answer (C) is incorrect because the height above the standard datum plane is pressure altitude.
3-7	7287	[B]	*A new question is added to read:* ALL **7287.** Under what condition is indicated altitude the same as true altitude? A—If the altimeter has no mechanical error. B—When at sea level under standard conditions. C—When at 18,000 feet MSL with the altimeter set at 29.92. On a standard day (29.92" Hg and +15°C) at sea level, pressure altitude, indicated altitude, and density altitude are all equal. Any variation from standard temperature or pressure will have an effect on the altimeter. (PLT023) — FAA-H-8083-25 Answer (A) is incorrect because mechanical error does not apply to true altitude. Answer (C) is incorrect because when the altimeter is set to 29.92, it indicates pressure altitude.
3-7	7289	[C]	*A new question is added to read:* ALL **7289.** The pitot system provides impact pressure for which instrument? A—Altimeter. B—Vertical-speed indicator. C—Airspeed indicator. The pitot tube provides input for the airspeed indicator only. (PLT337) — FAA-H-8083-25 Answer (A) is incorrect because the altimeter and vertical speed indicator operate off of the static system. Answer (B) is incorrect because the altimeter and vertical speed indicator operate off of the static system.
3-12	6711	[A]	*The question and answer stem A is changed to read:* AIR, RTC, LSA, WSC, PPC **7289.** During preflight in cold weather, crankcase breather lines should receive special attention because they are susceptible to being clogged by A—ice from crankcase vapors that have condensed and subsequently frozen.
3-13	7293	[A]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7293.** What action can a pilot take to aid in cooling an engine that is overheating during a climb? A—Reduce rate of climb and increase airspeed. B—Reduce climb speed and increase RPM. C—Increase climb speed and increase RPM. To avoid excessive cylinder head temperatures, a pilot can open the cowl flaps, increase airspeed, enrich the mixture, or reduce power. Any of these procedures will aid in reducing the engine temperature. Establishing a shallower climb (increasing airspeed) increases the airflow through the cooling system, reducing high engine temperatures. (PLT342) — FAA-H-8083-25 Answer (B) is incorrect because reducing airspeed hinders cooling, and increasing RPM will further increase engine temperature. Answer (C) is incorrect because increasing RPM will increase engine temperature.

Page Number	Question Number	Correct Answer	Explanation
3-13	7299	[A]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7299.** What should be the first action after starting an aircraft engine? A—Adjust for proper RPM and check for desired indications on the engine gauges. B—Place the magneto or ignition switch momentarily in the OFF position to check for proper grounding. C—Test each brake and the parking brake. As soon as the engine starts, check for unintentional movement of the aircraft and set power to the recommended warm-up RPM. The oil pressure should then be checked to determine that the oil system is functioning properly with pressure at recommended levels within the manufacturer's time limit. (PLT479) — FAA-H-8083-25 Answer (B) is incorrect because this is usually done at the end of the flight. Answer (C) is incorrect because brakes are checked when beginning to taxi.
3-13	7300	[C]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7300.** If the ground wire between the magneto and the ignition switch becomes disconnected, the engine A—will not operate on one magneto. B—cannot be started with the switch in the on position. C—could accidentally start if the propeller is moved with fuel in the cylinder. If the magneto switch ground wire is disconnected, the magneto is ON even though the ignition switch is in the OFF position. The engine could fire if the propeller is moved from outside the airplane. (PLT478) — FAA-H-8083-25 Answer (A) is incorrect because both magnetos remain on when the ground wire is disconnected. Answer (B) is incorrect because the engine can still be started, and the magnetos cannot be turned off.
3-13	7306	[B]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7306.** An abnormally high engine oil temperature indication may be caused by A—a defective bearing. B—the oil level being too low. C—operating with an excessively rich mixture. The oil pressure indication varies inversely with the oil temperature. High temperature and low pressure usually indicate low oil level. (PLT342) — FAA-H-8083-25 Answer (A) is incorrect because a defective bearing will increase metal particles in the oil, but will not significantly affect the oil temperature. Answer (C) is incorrect because a rich mixture results in lower engine operating temperatures; therefore, it would not increase engine oil temperature.
3-13	7307	[C]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7307.** For internal cooling, air cooled engines are especially dependent on A—a properly functioning thermostat. B—air flowing over the exhaust manifold. C—the circulation of lubricating oil. Oil, used primarily to lubricate the moving parts of the engine, also cools the internal parts of the engine as it circulates. (PLT324) — FAA-H-8083-25 Answer (A) is incorrect because most air-cooled aircraft engines do not have thermostats. Answer (B) is incorrect because, although air-cooling is important, internal cooling is more reliant on oil circulation. Air cools the cylinders, not the exhaust manifold.

Page Number	Question Number	Correct Answer	Explanation
3-14	7297	[A]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7297.** Fouling of spark plugs is more apt to occur if the aircraft A—gains altitude with no mixture adjustment. B—descends from altitude with no mixture adjustment. C—throttle is advanced very abruptly. If the fuel/air mixture is too rich, excessive fuel consumption, rough engine operation, and appreciable loss of power will occur. Because of excessive fuel, a cooling effect takes place which causes below normal temperatures in the combustion chambers. This cooling results in spark plug fouling. Unless the mixture is leaned with a gain in altitude, the mixture becomes excessively rich. (PLT478) — FAA-H-8083-25 Answer (B) is incorrect because descending without a mixture adjustment (operating with an excessively lean mixture) would result in overheating, rough engine operation, a loss of power, and detonation. Answer (C) is incorrect because advancing the throttle abruptly may cause the engine to hesitate or stop.
3-18	7290	[C]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7290.** Leaving the carburetor heat on during takeoff A—leans the mixture for more power on takeoff. B—will decrease the takeoff distance. C—will increase the ground roll. Use of carburetor heat enriches the mixture, which tends to reduce the output of the engine and also increases the operating temperature. Therefore, the heat should not be used when full power is required (such as during takeoff) or during normal engine operations, except to check for the presence of, or removal of carburetor ice. A decrease in engine output will increase the distance required to reach lift-off speed. Therefore, it will increase ground roll. (PLT189) — FAA-H-8083-25
3-18	7291	[C]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7291.** Which condition is most favorable to the development of carburetor icing? A—Any temperature below freezing and a relative humidity of less than 50 percent. B—Temperature between 32 and 50°F and low humidity. C—Temperature between 20 and 70°F and high humidity. If the temperature is between -7°C (20°F) and 21°C (70°F) with visible moisture or high humidity, the pilot should be constantly on the alert for carburetor ice. (PLT190) — FAA-H-8083-25 Answers (A) and (B) are incorrect because carburetor icing is more likely with high humidity.
3-18	7292	[C]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7292.** In an aircraft equipped with a fixed-pitch propeller and a float-type carburetor, the first indication of carburetor ice would most likely be A—a drop in oil temperature and cylinder head temperature. B—engine roughness. C—loss of RPM. For airplanes with a fixed-pitch propeller, the first indication of carburetor ice is loss of RPM. (PLT190) — FAA-H-8083-25 Answers (A) and (B) are incorrect because these symptoms may develop, but only after a loss of RPM.

Page Number	Question Number	Correct Answer	Explanation
3-20	7294	[B]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7294.** The best power mixture is that fuel/air ratio at which A—cylinder head temperatures are the coolest. B—the most power can be obtained for any given throttle setting. C—a given power can be obtained with the highest manifold pressure or throttle setting. The throttle setting determines the amount of air flowing into the engine. The mixture control is then adjusted to get the best fuel/air ratio, resulting in the best power the engine can develop at this particular throttle setting. (PLT253) — FAA-H-8083-25 Answer (A) is incorrect because the cylinder heads will be the coolest when mixture is richest. Answer (C) is incorrect because this describes the highest power setting.
3-20	7302	[C]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7302.** Unless adjusted, the fuel/air mixture becomes richer with an increase in altitude because the amount of fuel A—decreases while the volume of air decreases. B—remains constant while the volume of air decreases. C—remains constant while the density of air decreases. Fuel flow remains constant if no adjustments are made. The same volume of air goes into the carburetor, but the weight and density of the air is less, causing an excessively rich mixture, which causes spark plug fouling and decreased power. (PLT249) — FAA-H-8083-25
3-20	7303	[A]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7303.** The basic purpose of adjusting the fuel/air mixture control at altitude is to A—decrease the fuel flow to compensate for decreased air density. B—decrease the amount of fuel in the mixture to compensate for increased air density. C—increase the amount of fuel in the mixture to compensate for the decrease in pressure and density of the air. Fuel flow remains constant if no adjustments are made. The same volume of air goes into the carburetor, but the weight and density of the air is less, causing an excessively rich mixture, which causes spark plug fouling and decreased power. (PLT249) — FAA-H-8083-25
3-20	7304	[C]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7304.** The pilot controls the air/fuel ratio with the A—throttle. B—manifold pressure. C—mixture control. The fuel/air ratio of the combustible mixture delivered to the engine is controlled by the mixture control. (PLT249) — FAA-H-8083-25 Answer (A) is incorrect because the throttle regulates the total volume of fuel and air entering the combustion chamber. Answer (B) is incorrect because the manifold pressure indicates the engine's power output.

Page Number	Question Number	Correct Answer	Explanation
3-20	7305	[B]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7305.** At high altitudes, an excessively rich mixture will cause the A—engine to overheat. B—fouling of spark plugs. C—engine to operate smoother even though fuel consumption is increased. Fuel flow remains constant if no adjustments are made. The same volume of air goes into the carburetor, but the weight and density of the air is less, causing an excessively rich mixture, which causes spark plug fouling and decreased power. (PLT253) — FAA-H-8083-25 Answer (A) is incorrect because a lean mixture will cause the engine to overheat. Answer (C) is incorrect because an engine runs smoother when the mixture is adjusted for the altitude.
3-23	7298	[C]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7298.** Detonation can be caused by A—a short ground operation. B—a "rich" mixture. C—using a lower grade of fuel than recommended. Detonation is a sudden explosion or shock to a small area of the piston top, rather than the normal smooth burn in the combustion chamber. It can be caused by low grade fuel or a lean mixture. (PLT115) — FAA-H-8083-25
3-23	7295	[C]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7295.** Detonation occurs in a reciprocating aircraft engine when A—the spark plugs are fouled or shorted out or the wiring is defective. B—hot spots in the combustion chamber ignite the fuel/air mixture in advance of normal ignition. C—the unburned charge in the cylinders explodes instead of burning normally. Detonation is a sudden explosion, or instantaneous combustion, of the fuel/air mixture in the cylinders, producing extreme heat and severe structural stresses on the engine. (PLT115) — FAA-H-8083-25 Answer (A) is incorrect because detonation does not have anything to do with the wiring. Answer (B) is incorrect because this describes preignition, not detonation.
3-23	7296	[B]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7296.** If a pilot suspects that the engine (with a fixed-pitch propeller) is detonating during climb-out after takeoff, the initial corrective action to take would be to A—lean the mixture. B—lower the nose slightly to increase airspeed. C—apply carburetor heat. To prevent detonation, the pilot should use the correct grade of fuel, maintain a sufficiently rich mixture, open the throttle smoothly, and keep the temperature of the engine within recommended operating limits. Some aircraft have an automatically enriched mixture for enhanced cooling in takeoff and climb-out at full throttle. Lowering the nose will allow the aircraft to gain airspeed, which eventually lowers the engine temperature. (PLT115) — FAA-H-8083-25 Answer (A) is incorrect because leaning the mixture increases engine temperatures; detonation results from excessively high engine temperatures. Answer (C) is incorrect because although a richer fuel mixture results from applying carburetor heat, the heat may offset the cooling effect of the mixture change. The most efficient initial action would be to increase airspeed.

Page Number	Question Number	Correct Answer	Explanation
3-23	7301	[C]	*A new question is added to read:* AIR, RTC, WSC, PPC, LSA **7301.** Detonation occurs in a reciprocating aircraft engine when A—there is an explosive increase of fuel caused by too rich a fuel/air mixture. B—the spark plugs receive an electrical jolt caused by a short in the wiring. C—the unburned fuel/air charge in the cylinders is subjected to instantaneous combustion. Detonation is a sudden explosion, or instantaneous combustion, of the fuel/air mixture in the cylinders, producing extreme heat and severe structural stresses on the engine. (PLT115) — FAA-H-8083-25 Answer (A) is incorrect because detonation is caused by too lean a mixture. Answer (B) is incorrect because detonation does not have anything to do with the wiring.
4-4	7310	[C]	*A new question is added to read:* ALL **7310.** (Refer to Figure 24.) What is the effect of a temperature increase from 30 to 50 °F on the density altitude if the pressure altitude remains at 3,000 feet MSL? A—900-foot increase. B—1,100-foot decrease. C—1,300-foot increase. Referencing FAA Figure 24, use the following steps: 1. Enter the density altitude chart at 30°F. Proceed upward to the 3,000-foot pressure altitude line. From the point of intersection, move left to the edge of the chart and read a density altitude of 1,650 feet. 2. Enter the density altitude chart at 50°F. Proceed upward to the 3,000-foot pressure altitude line. From the point of intersection, move left to the edge of the chart and read a density altitude of 3,000 feet. 3. Find the difference between the two values: 3,000 – 1,650 = 1,350 foot (increase). (PLT005) — FAA-H-8083-25
4-4	7286	[A]	*A new question is added to read:* ALL **7286.** (Refer to figure 24.) Determine the pressure altitude at an airport that is 3,563 feet MSL with an altimeter setting of 29.96. A—3,527 feet MSL. B—3,556 feet MSL. C—3,639 feet MSL. Referencing FAA Figure 24, use the following steps: 1. Since the altimeter setting that is given is not shown in FAA Figure 8, interpolation is necessary. Locate the settings immediately above and below the given value of 29.96" Hg: Altimeter Setting Conversion Factor 29.92 0 feet 30.00 -73 feet 2. Determine the difference between the two conversion factors: 0 – 73 = -73 feet. The setting 29.96 is halfway between the two values, so: -73 ÷ 2 = -36.5 feet. 3. Determine the amount of difference to be subtracted from the 30.00" Hg conversion factor. 4. Subtract the correction factor from the airport elevation to find pressure altitude: 3,563.0 – 36.5 = 3,526.5 feet MSL (pressure altitude). (PLT019) — FAA-H-8083-25

Page Number	Question Number	Correct Answer	Explanation
4-4	7308	[B]	*A new question is added to read:* ALL **7308.** What effect does high density altitude, as compared to low density altitude, have on propeller efficiency and why? A—Efficiency is increased due to less friction on the propeller blades. B—Efficiency is reduced because the propeller exerts less force at high density altitudes than at low density. C—Efficiency is reduced due to the increased force of the propeller in the thinner air. The propeller produces thrust in proportion to the mass of air being accelerated through the rotating blades. If the air is less dense, propeller efficiency is decreased. (PLT351) — FAA-H-8083-25
4-16	7141	[A]	*Answer stem C and the incorrect answer explanaition are changed to read:* C—Lower true airspeed and longer landing distance. Answer (C) is incorrect because true airspeed will be higher in the mountains.
4-26	7309	[A]	*A new question is added to read:* ALL **7309.** With respect to using the weight information given in a typical aircraft owner's manual for computing gross weight, it is important to know that if items have been installed in the aircraft in addition to the original equipment, the A—allowable useful load is decreased. B—allowable useful load remains unchanged. C—maximum allowable gross weight is increased. The empty weight and moment given in most manufacturers' handbooks are for the basic aircraft prior to the installation of additional optional equipment. When the owner later adds items such as radio navigation equipment, autopilot, deicers, etc., the empty weight and the moment are changed. These changes must be recorded in the aircraft's weight and balance data and used in all computations. (PLT328) — FAA-H-8083-25
5-29	6249	[A]	*The question is changed to read:* ALL **6249.** Consider the following statements regarding an Aviation Routine Weather Report (METAR). 1. A vertical visibility entry does not constitute a ceiling. 2. Fog (FG) can be reported only if the visibility is less than 5/8 mile. 3. The ceiling layer will be designated by a 'C'. 4. Mist (BR) can be reported only if the visibility is 5/8 mile up to six miles. 5. Temperatures reported below zero will be prefixed with a '-'. 6. There is no provision to report partial obscurations. Select the true statements.
5-33	6265	[B]	*The question is changed to read:* ALL **6265.** Vertical visibility is shown on METAR/TAF reports when the sky is

Page Number	Question Number	Correct Answer	Explanation
8-8	Chapter Text		*The chapter text is changed to read:*

Medical Certificates

Student pilot, recreational pilot, and private pilot operations, other than glider and balloon pilots, require a Third-Class Medical Certificate. A Third-Class Medical Certificate expire at the end of:

1. The 60th month after the month of the date of the examination shown on the certificate if the person has not reached his or her 40th birthday on or before the date of examination; or

2. The 24th month after the month of the date of examination shown on the certificate if the person has reached his or her 40th birthday on or before the date of the examination.

The holder of a Second-Class Medical Certificate may exercise commercial privileges during the first 12 calendar months, but the certificate is valid only for private pilot privileges during the following (12 or 24) calendar months, depending on the applicant's age.

The holder of a First-Class Medical Certificate may exercise Airline Transport Pilot privileges during the first 12 calendar months, commercial privileges during the following 6 calendar months, and private pilot privileges during the following (12 or 48) calendar months, depending on the applicant's age.

Each type of medical certificate is valid through the last day of the month (of the month it expires), regardless of the day the physical examination was given.

8-8	6324	[B]	*Answer stem C is changed to read:* C – May 31, 60 months later.
8-8	6325	[B]	*The explanation is changed to read:* A Second-Class Medical Certificate expires at the end of the last day of the 12th month after the month of the date of examination shown on the certificate, for operations requiring a Commercial Pilot Certificate. It expires at the end of the last day of the 24th or 48th month (depending on the applicant's age) after the month of the date of examination shown on the certificate, for operations requiring only a Private or Student Pilot Certificate. A certificate issued on January 18 of this year will expire on January 31 of the next year for commercial pilot privileges, but it may be used for private pilot privileges until January 31, two (or five, depending on the applicant's age) years later.