

The following sample exam for Airline Transport Pilot (135) (ATA) is suitable study material for ATA and airplane added rating (ARA) exams. The full ATA test is 80 questions; the added rating (ARA) is 50 questions. Please note that the ATA/ARA and Airline Transport Pilot Helicopter (ATH, ARH) tests share many questions. Students for the ATH and ARH would do well to study both sets of questions concerning 14 CFR 135. The Application Identification, Information Verification and Authorization Requirements Matrix lists all FAA exams. It is available at: http://www.faa.gov/training_testing/testing/airmen/media/testing_matrix.pdf

The FAA testing system is supported by a series of supplement publications. These publications include the graphics, legends, and maps that are needed to successfully respond to certain test questions. FAA-CT-8080-7C, Computer Testing Supplement for Airline Transport Pilot and Aircraft Dispatcher, and its 2 addendums are available at:

http://www.faa.gov/training_testing/testing/airmen/test_questions/media/FAA-CT-8080-7C.pdf

Addendum A, July 2011

http://www.faa.gov/training_testing/testing/airmen/test_questions/media/Addendum_A_ATP_Sup_7C.pdf

Addendum B, May 2012

http://www.faa.gov/training_testing/testing/airmen/test_questions/media/Addendum_B_ATP_Sup_7C.pdf

The Learning Statement Reference Guide for Airman Knowledge Testing contains listings of learning statements with their associated codes. Matching the learning statement codes with the codes listed on your Airman Knowledge Test Report assists in the evaluation of knowledge areas missed on your exam. It is available at: http://www.faa.gov/training_testing/testing/airmen/media/LearningStatementReferenceGuide.pdf

SAMPLE ATA EXAM:

1. PLT477

The stall speed of an airplane

- A) is constant regardless of weight or airfoil configuration.
- B) is affected by weight, and bank angle.
- C) is not affected by dynamic pressures and lift co-efficient.

2. PLT213

What is a characteristic of longitudinal instability?

- A) Bank oscillations becoming progressively greater.
- B) Aircraft constantly tries to pitch down.
- C) Pitch oscillations becoming progressively greater.

3. PLT237

By changing the angle of attack of a wing, the pilot can control the airplane's

- A) lift, gross weight, and drag.
- B) lift and airspeed, but not drag.
- C) lift, airspeed, and drag.

4. PLT499

The most important restriction to the operation of turbojet or turboprop engines is

- A) limiting compressor speed.
- B) limiting torque.
- C) limiting exhaust gas temperature.

5. PLT104

The crew monitoring function is essential,

- A) particularly during high altitude cruise flight modes to prevent CAT issues.
- B) particularly during approach and landing to prevent CFIT.
- C) during RNAV departures in class B airspace.

6. PLT104

CRM training refers to

- A) the two components of flight safety and resource management, combined with mentor feedback.
- B) the three components of initial indoctrination awareness, recurrent practice and feedback, and continual reinforcement.
- C) the five components of initial indoctrination awareness, communication principles, recurrent practice and feedback, coordination drills, and continual reinforcement.

7. PLT097

What is a symptom of carbon monoxide poisoning?

- A) Rapid, shallow breathing.
- B) Dizziness.
- C) Pain and cramping of the hands and feet.

8. PLT280

The illusion of being in a noseup attitude which may occur during a rapid acceleration takeoff is known as

- A) somatogravic illusion.
- B) autokinesis.
- C) inversion illusion.

9. PLT280

Sudden penetration of fog can create the illusion of

- A) leveling off.
- B) pitching up.
- C) pitching down.

10. PLT205

What is the effect of alcohol consumption on functions of the body?

- A) Alcohol has an adverse effect, especially as altitude increases.
- B) Alcohol has little effect if followed by equal quantities of black coffee.
- C) Small amounts of alcohol in the human system increase judgment and decision-making abilities.

11. PLT203

Which feature is associated with the tropopause?

- A) Absence of wind and turbulence.
- B) Abrupt change of temperature lapse rate.
- C) Absolute upper limit of cloud formation.

12. PLT302

Which type clouds may be associated with the jetstream?

- A) Cumulonimbus cloud line where the jetstream crosses the cold front.
- B) Cirrostratus cloud band on the polar side and under the jetstream.
- C) Cirrus clouds on the equatorial side of the jetstream.

13. PLT108

Freezing Point Depressant (FPD) fluids used for deicing

- A) on the ground, cause no performance degradation during takeoff.
- B) provide ice protection during flight.
- C) are intended to provide ice protection on the ground only.

14. PLT274

The following weather condition may be conducive to severe in-flight icing:

- A) visible rain at temperatures below 0° C ambient air temperature.
- B) visible moisture at temperatures below 5° C ambient temperature.
- C) visible rain at temperatures below 10° C ambient temperature.

15. PLT475

Where do squall lines most often develop?

- A) Ahead of a cold front.
- B) In an occluded front.
- C) Behind a stationary front.

16. PLT495

Convective clouds which penetrate a stratus layer can produce which threat to instrument flight?

- A) Freezing rain.
- B) Embedded thunderstorms.
- C) Clear air turbulence.

17. PLT302

Where are jetstreams normally located?

- A) In a break in the tropopause where intensified temperature gradients are located.
- B) In areas of strong low pressure systems in the stratosphere.
- C) In a single continuous band, encircling the Earth, where there is a break between the equatorial and polar tropopause.

18. PLT493

Which conditions result in the formation of frost?

- A) The temperature of the collecting surface is at or below freezing and small droplets of moisture are falling.
- B) Temperature of the collecting surface is below the dewpoint and the dewpoint is also below freezing.
- C) Dew collects on the surface and then freezes because the surface temperature is lower than the air temperature.

19. PLT354

A GPS missed approach requires that the pilot take action to sequence the receiver

- A) over the MAWP.
- B) after the MAWP.
- C) just prior to the MAWP.

20. PLT354

To conduct a localizer performance with vertical guidance (LPV) RNAV (GPS) approach, the aircraft must be furnished with

- A) a GPS/WAAS receiver approved for an LPV approach by the AFM supplement.
- B) a GPS (TSO-129) receiver certified for IFR operations.
- C) an IFR approach-certified system with required navigation performance (RNP) of 0.5.

21. PLT195

With no traffic identified by TCAS, you

- A) can rest assured that no other aircraft are in the area.
- B) must continually scan for other traffic in visual conditions.
- C) must scan only for hot air balloons.

22. PLT506

The maximum speed during takeoff that the pilot may abort the takeoff and stop the airplane within the accelerate-stop distance is

- A) VEF.
- B) V1.
- C) V2.

23. PLT395

What is the name of an area beyond the end of a runway which does not contain obstructions and can be considered when calculating takeoff performance of turbine-powered aircraft?

- A) Stopway.
- B) Obstruction clearance plane.
- C) Clearway.

24. PLT432

"Operational control" of a flight refers to

- A) exercising the privileges of pilot in command of an aircraft.
- B) the specific duties of any required crewmember.
- C) exercising authority over initiating, conducting, or terminating a flight.

25. PLT442

To serve as pilot in command in an IFR operation, a person must have passed a line check

- A) within the past 12 months, which include a portion of a civil airway and one instrument approach at one representative airport, in one of the types of aircraft which that pilot is to fly.
- B) since the beginning of the 12th month before that service, which included at least one flight over a civil airway, or approved off-airway route, or any portion of either, in one type of aircraft which that pilot is to fly.
- C) consisting of a flight over the route to be flown, with at least three instrument approaches at representative airports, within the past 12 calendar months, in one type of aircraft which that pilot is to fly.

26. PLT404

An airplane, operated by a commuter air carrier, flying in extended overwater operations must carry enough approved liferafts of a rated capacity and buoyancy to accommodate the occupants of the aircraft. Each liferaft must be equipped with

- A) one approved pyrotechnic signaling device.
- B) one fishing kit for each person, the raft is rated to carry.
- C) colored smoke flares and a signal mirror.

27. PLT404

Federal Aviation Regulations require that interior emergency lights, on aircraft having a passenger seating configuration of 20 to

- A) be armed or turned on during taxiing and all flight operations.
- B) operate automatically when subjected to a negative G load.
- C) be operable manually from the flightcrew station and a point in the passenger compartment.

28. PLT405

No person may operate an aircraft under 14 CFR part 135, carrying passengers under VFR at night, unless

- A) it is equipped with a flashlight having at least two size 'D' cell or the equivalent.
- B) each flight crewmember has a flashlight having at least two size 'D' batteries or the equivalent.
- C) each crewmember has a flashlight having at least two size 'D' cells and a spare bulb.

29. PLT444

The pilot in command may deviate from 14 CFR Part 135 during an emergency involving the safety of persons or property only

- A) if required to, by the emergency cockpit checklist.
- B) after ATC is notified of the emergency and the extent of deviation required.
- C) to the extent required to meet that emergency.

30. PLT438

Above which altitude/flight level must at least one of the two pilots, at the controls of a pressurized aircraft (with quick-donning masks) wear a secured and sealed oxygen mask?

- A) FL 300.
- B) FL 250.
- C) FL 350.

31. PLT385

Which restriction must be observed regarding the carrying of cargo in the passenger compartment?

- A) It is packaged or covered to avoid possible injury to occupants.
- B) Cargo carried in passenger seats must be forward of all passengers.
- C) All cargo must be carried in a suitable bin and secured to a passenger seat or the floor structure of the aircraft.

32. PLT385

In a cargo-only operation, cargo must be loaded

- A) in such a manner that at least one emergency or regular exit is available to all crewmembers, if an emergency occurs.
- B) in such a manner that at least one emergency or regular exit is available to all occupants.
- C) so that it does not obstruct the aisle between the crew and cargo compartments.

33. PLT282

If previous arrangements have not been made by the operator, where can the procedures for servicing the aircraft be found?

- A) Certificate holder's manual.
- B) Certificate holder's maintenance manual.
- C) Pilot's Handbook.

34. PLT392

An aircraft being operated outside of the United States, over a foreign country, by a 14 CFR part 135 operator must comply with

- A) rules of the U.S. State Department and the foreign country.
- B) regulations of the foreign country.
- C) the International Civil Aviation Organization (ICAO), Annex 3, Rules of the Air.

35. PLT282

Which condition must be met to conduct IFR operations from an airport that is not at the location where weather observations are made?

- A) The Administrator must issue Operations Specifications that permit the procedure.
- B) An 'Authorization Letter' permitting the procedure must be issued by the FAA district office charged with the overall inspection of the certificate holder..
- C) A 'Letter of Waiver' authorizing the procedure must be issued by the Administrator, after an investigation by the U.S. National Weather Service and the FSDO which find the standard of safety to be satisfactory.

36. PLT139

In which airplanes is a Class A TAWS warning system required?

- A) Turbine-powered aircraft having a passenger seating configuration, including any pilot seat, of 10 seats or more.
- B) Turbine-powered airplanes having a passenger seating configuration, excluding any pilot seat, of 10 seats or more.
- C) All airplanes having a passenger seating configuration, excluding any pilot seat, of 10 seats or more.

37. PLT437

Which is a requirement for life preservers during extended overwater operations? Each life preserver must be equipped with

- A) one flashlight having at least two size 'D' cells or equivalent.
- B) a dye marker.
- C) an approved survivor locator light.

38. PLT405

During which time period must a required voice recorder of a passenger-carrying airplane be continuously operated?

- A) From engine start at departure airport to engine shutdown at landing airport.
- B) From the use of the checklist before the flight to completion of the final check at the end of the flight.
- C) From the beginning of taxi to the end of the landing roll.

39. PLT454

The weight and CG of an aircraft used in 135 operations must have been calculated from those values established by actual weighing of the aircraft within what period of time?

- A) Multiengine aircraft, last 36 calendar months; single-engine, last 24 calendar months.
- B) Multiengine and single-engine aircraft, preceding 36 calendar months.
- C) Multiengine aircraft, preceding 36 calendar months.

40. PLT437

Which performance requirement applies to passenger-carrying land airplanes being operated over water?

- A) Multiengine airplanes must be able to climb, with the critical engine inoperative, at least 100 ft/min at 1,000 feet above the surface.
- B) Single-engine airplanes must be operated at an altitude that will allow them to reach land in case of engine failure.
- C) Multiengine airplanes must be able to climb, with the critical engine inoperative, at least 50 ft/min at 1,500 feet above the surface.

41. PLT442

A pilot, acting as second in command under 14 CFR 135, successfully completes the instrument competency check specified in FAR Part 61. How long does this pilot remain current if no further IFR flights are made?

- A) 6 months.
- B) 90 days.
- C) 12 months.

42. PLT108

A pretakeoff contamination check for snow, ice or frost is required by 14 CFR Part 135. This check is required to

- A) be completed within 5 minutes prior to beginning the taxi to the runway.
- B) be made within 2 minutes of starting the takeoff roll.
- C) see that the aircraft is clean; therefore, a safe takeoff can be made during the next 5 minutes.

43. PLT029

With regard to flight crewmember duties, which operations are considered to be in the 'critical phase of flight'?

- A) Descent, approach, landing, and taxi operations, irrespective of altitudes MSL.
- B) All ground operations involving taxi, takeoff, landing, and all other operations conducted below 10,000 feet, excluding cruise flight.
- C) All ground operations involving taxi, takeoff, landing, and all other operations conducted below 10,000 feet MSL, including cruise flight.

44. PLT384

Before each takeoff, the pilot in command of an aircraft carrying passengers shall ensure that all passengers have been orally briefed on the

- A) use of seatbelts, smoking, and location and use of survival equipment.
- B) location of normal and emergency exits, oxygen masks, and life preservers.
- C) use of safety belts, location and operation of fire extinguishers, and smoking.

45. PLT436

Who may be allowed to carry a deadly weapon on board an aircraft operated under FAR Part 135?

- A) Crewmembers and/or others authorized by the certificate holder.
- B) Official bodyguards attached to foreign legations.
- C) Employees of a municipality or a state, or of the United States.

46. PLT407

A commuter air carrier certificate holder plans to assign a pilot as pilot in command of an aircraft having eight passenger seats to be used in passenger-carrying operations. Which experience requirement must that pilot meet if the aircraft is to be flown with an operative approved autopilot and no second in command?

- A) 50 hours and 10 landings as pilot in command in the make and model.
- B) 100 hours as pilot in command in the category, class, and type.
- C) 100 hours as pilot in command in the make and model.

47. PLT400

The load manifest must be prepared prior to each takeoff for

- A) any aircraft with more than one engine.
- B) any aircraft with a passenger seating capacity of 10 seats or more.
- C) all helicopters and large aircraft operated by a commuter air carrier.

48. PLT413

If the weather forecasts do not require the listing of an alternate airport on an IFR flight, the airplane must carry sufficient fuel to fly to the destination airport and

- A) fly for 45 minutes thereafter at normal cruise climb speed.
- B) make one missed approach and thereafter have a 45-minute reserve at normal cruising speed.
- C) fly thereafter for 45 minutes at normal cruising speed.

49. PLT459

No person may takeoff an aircraft under IFR from an airport that has takeoff weather minimums but that is below landing minimums unless there is an alternate airport within

- A) 1 hour at normal cruise speed in still air of the departure airport.
- B) 1 hour at normal indicated airspeed of the departure airport.
- C) 1 hour at normal cruise speed in still air with one engine operating.

50. PLT407

(Refer to appendix 2, figures 168 and 301.) The PIC (single pilot 135 with A/P) of PTZ 70 has less than 100 hours of PIC time in the BE 1900. Due to BUF weather being 100 feet, 1/4 mile in blowing snow, which is below landing minimums, the PIC requested and received clearance to SYR, the filed alternate.

Under Part 135 what are the PIC's minimums at SYR for the ILS RWY 10?

- A) 800/2.
- B) 719/42.
- C) 619/50.

51. PLT493

Which is an operational requirement concerning ice, snow, or frost on structural surfaces?

- A) If snow, ice, or frost is adhering to the airplane's lift or control surfaces, but polished smooth, a takeoff may be made.
- B) A takeoff may be made with ice, snow, or frost adhering to the wings or stabilizing or control surfaces, but polished smooth, if the anti-icing and deicing equipment is operating.
- C) A takeoff may not be made if ice or snow is adhering to the wings or stabilizing or control surfaces.

52. PLT442

No person may serve, as second in command of an aircraft (under part 135), unless they hold a commercial pilot certificate with the appropriate category, class rating and an instrument rating. For flight under IFR, that person must have accomplished within the last 6 months, the recent instrument requirements of

- A) holding procedures, using the navigation systems for intercepting and tracking courses, and 6 instrument approaches.
- B) using the navigation systems for interception and tracking of courses, 6 instrument low approaches and holding.
- C) using the navigation systems to intercept and track 3 inbound/3outbound courses, 6 holding patterns and 6 instrument approaches.

53. PLT463

An employee who performs safety-sensitive functions, for a certificate holder, who has actual knowledge of an accident involving an aircraft for which he or she performed a safety-sensitive function at or near the time of the accident shall not use alcohol

- A) within 8 hours of the accident.
- B) until given a release by the NTSB or FAA.
- C) until 4 hours after the accident.

54. PLT456

(Refer to appendix 2, figure 1.) What is the maximum landing distance that may be used by a turbine-engine-powered, small transport category airplane to land on Rwy 6 (wet) at the destination airport?

- A) 9,100 feet.
- B) 6,279 feet.
- C) 5,460 feet.

55. PLT282

If a certificate holder makes arrangements for another person to perform aircraft maintenance, that maintenance shall be performed in accordance with the

- A) provisions of a contract prepared by a certificate holder and approved by the supervising FAA district office.
- B) certificate holder's manual and FAR Parts 43, 91, and 135.
- C) provisions and standards as outlined in the certificate holder's manual.

56. PLT463

How soon after the conviction for driving while intoxicated by alcohol or drugs shall it be reported to the FAA, Civil Aviation Security Division?

- A) No later than 60 days after the motor vehicle action.
- B) No later than 30 working days after the motor vehicle action.
- C) Required to be reported upon renewal of medical certificate.

57. PLT409

In a 24-hour consecutive period, what is the maximum time, excluding briefing and debriefing, that an airline transport pilot may instruct other pilots in air transportation service?

- A) 6 hours.
- B) 10 hours.
- C) 8 hours.

58. PLT409

What instrument flight time may be logged by a second in command of an aircraft requiring two pilots?

- A) One-half the time the flight is on an IFR flight plan.
- B) All of the time the second in command is controlling the airplane solely by reference to flight instruments.
- C) One-half the time the airplane is in actual IFR conditions.

59. PLT161

The maximum indicated airspeed that an aircraft may be flown in Class B airspace, after departing the primary airport, while at 1,700 feet AGL and 3.5 nautical miles from the airport is

- A) 250 knots.
- B) 200 knots.
- C) 230 knots.

60. PLT163

What is the required flight visibility and distance from clouds if you are operating in Class E airspace at 9,500 feet with a VFR-on-Top clearance during daylight hours?

- A) 3 statute miles, 500 feet above, 1,000 feet below, and 2,000 feet horizontal.
- B) 5 statute miles, 500 feet above, 1,000 feet below, and 2,000 feet horizontal.
- C) 3 statute miles, 1,000 feet above, 500 feet below, and 2,000 feet horizontal.

61. PLT277

If the middle marker for a Category I ILS approach is inoperative,

- A) the RVR required to begin the approach is increased by 20%.
- B) the DA/DH is increased by 50 feet.
- C) the inoperative middle marker has no effect on straight-in minimums.

62. PLT463

A person may not act as a crewmember of a civil aircraft if alcoholic beverages have been consumed by that person within the preceding

- A) 12 hours.
- B) 24 hours.
- C) 8 hours.

63. PLT388

For what purpose may cockpit voice recorders and flight data recorders NOT be used?

- A) Identifying procedures that may have been conducive to any accident, or occurrence resulting in investigation under NTSB Part 830.
- B) Determining causes of accidents and occurrences under investigation by the NTSB.
- C) Determining any certificate action, or civil penalty, arising out of an accident or occurrence.

64. PLT161

At what minimum altitude is a turbine- engine-powered, or large airplane, required to enter Class D airspace?

- A) 2,000 feet AGL.
- B) 2,500 feet AGL.
- C) 1,500 feet AGL.

65. PLT420

What minimum ground visibility may be used instead of a prescribed visibility criteria of RVR 16 when that RVR value is not reported?

- A) 1/4 SM.
- B) 3/8 SM.
- C) 3/4 SM.

66. PLT405

An approved minimum equipment list or FAA Letter of Authorization allows certain instruments or equipment

- A) to be inoperative prior to beginning a flight in an aircraft if prescribed procedures are followed.
- B) to be inoperative anytime with no other documentation required or procedures to be followed.
- C) to be inoperative for a one-time ferry flight of a large airplane to a maintenance base without further documentation from the operator or FAA with passengers on board.

67. PLT420

In addition to the localizer, glideslope, marker beacons, approach lighting, and HIRL, which ground components are required to be operative for a Category II instrument approach to a DH below 150 feet AGL?

- A) Radar, VOR, ADF, runway exit lights, and RVR.
- B) RCLS and REIL.
- C) Each required ground component.

68. PLT420

When must the pilot initiate a missed approach procedure from an ILS approach?

- A) At the DA/DH, if the visual references for the intended runway are not distinctly visible, or anytime thereafter that visual reference is lost.
- B) When the time has expired after reaching the DA/DH and the runway environment is not clearly visible.
- C) At the DA/DH when the runway is not clearly visible.

69. PLT420

Under which condition, if any, may a pilot descend below DH or MDA when using the ALSF-1 approach light system as the primary visual reference for the intended runway?

- A) Descent to the intended runway is authorized as long as any portion of the approach light system can be seen.
- B) The approach light system can be used as a visual reference, except that descent below 100 feet above TDZE requires that the red light bars be visible and identifiable.
- C) Under no condition can the approach light system serve as a necessary visual reference for descent below DH or MDA.

70. PLT147

A pilot approaching to land a turbine-powered airplane on a runway served by a VASI shall

- A) maintain an altitude at or above the glide slope until a lower altitude is necessary for a safe landing.
- B) use the VASI only when weather conditions are below basic VFR.
- C) not use the VASI unless a clearance for a VASI approach is received.

71. PLT373

No person may operate a U.S. registered civil aircraft

- A) for which an AFM or RFM is required by part 21 section 21.5 unless there is a current, approved operator's manual available.
- B) for which an AFM or RFM is required by part 21 section 21.5 unless there is a current, approved AFM or RFM available.
- C) for which an AFM or RFM is required by part 21 section 21.5 unless there is a current, approved AFM or RFM available or the manual specified in part 135 section 135.19(b).

72. PLT385

Which is a requirement governing the carriage of carry-on baggage?

- A) All carry-on baggage must be restrained so that its movement is prevented during air turbulence.
- B) Pieces of carry-on baggage weighing more than 10 pounds must be carried in an approved rack or bin.
- C) Carry-on baggage must be stowed under the seat in front of the owner.

73. PLT425

Before an ETOPS flight may commence, an ETOPS

- A) preflight check must be conducted by a certified A&P and signed off in the logbook.
- B) pre-departure service check must be certified by a PDSC Signatory Person.
- C) pre-departure check must be signed off by an A&P or the PIC for the flight.

74. PLT076

(Refer to appendix 2, figure 149.) What will be the wind and temperature trend for an SAT ELP TUS flight at 16,000 feet?

- A) Temperature decrease slightly.
- B) Wind direction shift from southwest to east.
- C) Windspeed decrease.

75. PLT121

What is the maximum allowable weight that may be carried on a pallet which has the dimensions of 96.1 X 133.3 inches?

Floor load limit	249 lb/sq ft
Pallet weight	347 lb
Tiedown devices	134 lb

- A) 21,669.8 pounds.
- B) 22,120.8 pounds.
- C) 21,803.8 pounds.

76. PLT240

What are some characteristics of an airplane loaded with the CG at the aft limit?

- A) Lowest stall speed, lowest cruise speed, and highest stability.
- B) Highest stall speed, highest cruise speed, and least stability.
- C) Lowest stall speed, highest cruise speed, and least stability.

77. PLT021

(Refer to appendix 2, figures 3, 6, 8, 9, 10, and 11.) What is the CG shift if the passengers in row 1 are moved to seats in row 9 under Loading Conditions BE-1?

- A) 6.2 inches aft.
- B) 1.5 inches aft.
- C) 5.6 inches aft.

78. PLT501

If severe turbulence is encountered, which procedure is recommended?

- A) Maintain a constant altitude.
- B) Maintain constant airspeed and altitude.
- C) Maintain a constant attitude.

79. PLT317

(Refer to appendix 2, figure 144.) How will the aircraft in position 4 be affected by a microburst encounter?

- A) Performance increasing with a tailwind and updraft.
- B) Performance decreasing with a headwind and downdraft.
- C) Performance decreasing with a tailwind and downdraft.

80. PLT509

Wingtip vortices created by large aircraft tend to

- A) sink below the aircraft generating the turbulence.
- B) accumulate and remain for a period of time at the point where the takeoff roll began.
- C) rise from the surface to traffic pattern altitude.