

PRACTICE EXAM 9 — FULL 125-QUESTION SIMULATION

1. An aircraft is loaded with a total weight of 120,000 lb and a total moment of 71,400,000 in-lb. The CG location aft of the datum is:

- A. 595 inches
- B. 620 inches
- C. 640 inches
- D. 660 inches

2. A crew planning a takeoff finds the second-segment climb gradient is limiting their allowable weight. To increase the permitted takeoff weight, a valid option (conditions permitting) is to:

- A. select reduced thrust to lower engine wear
- B. load additional fuel to relieve wing stress
- C. increase the flap setting to its maximum
- D. use a runway with greater length and better conditions

3. A crew loses an engine at FL410 over high terrain and begins a driftdown at L/D MAX. The reason for selecting L/D MAX is to:

- A. reach the destination on schedule
- B. accelerate the descent to clear terrain quickly
- C. minimize the descent rate and level off as high as possible
- D. maintain cruise altitude on the single engine

4. A swept-wing jet at a hot, high-elevation airport requires a longer takeoff roll than at a cool, sea-level field. The combined effect of reduced low-speed lift and high density altitude is to:

- A. increase the speed and distance required to become airborne
- B. lower the required rotation speed
- C. raise the critical Mach number for the climb
- D. reduce the engine's EGT limit

5. A crew reviewing the takeoff climb segments knows the most critical, flown at V₂ with takeoff flaps from gear-up to at least 400 feet, requires a minimum gradient, for a twin, of:

- A. 1.2 percent
- B. 2.4 percent
- C. 3.0 percent
- D. a positive gradient only

6. A jet near its maximum altitude enters the coffin corner. The danger there arises because:

- A. the cabin loses pressurization at that altitude
- B. the engines cannot produce maximum continuous thrust
- C. the low-speed stall and high-speed Mach boundaries converge
- D. the autopilot disconnects at the aerodynamic ceiling

7. A crew exceeds critical Mach in a descent and the nose pitches down, accelerating further. The captain recognizes Mach tuck and reduces speed; the system that normally prevents this tendency is the:

- A. yaw damper
- B. Mach trim system
- C. autothrottle
- D. stick shaker

8. A crew continues a takeoff after an engine fails just past V₁. The most immediate handling task is to:

- A. maintain directional control against the asymmetric thrust
- B. retract the flaps to reduce drag immediately
- C. reduce thrust on the operating engine
- D. lower the nose well below the horizon

9. A crew dispatching a domestic Part 121 flight that requires an alternate computes fuel to reach the destination, then the most distant alternate, and then:

- A. holds 45 minutes before proceeding to the alternate
- B. flies to the nearest alternate regardless of distance
- C. carries 45 minutes at normal cruise consumption
- D. lands immediately if the destination drops below minimums

10. A crew reviewing weight limits explains that fuselage payload increases wing-bending stress while wing fuel relieves it. The structural limit capping non-fuel weight is the:

- A. maximum takeoff weight
- B. maximum landing weight
- C. maximum ramp weight
- D. maximum zero fuel weight

11. A crew in icing conditions selects wing anti-ice, which draws bleed air. The captain anticipates, as a consequence:

- A. an increase in available climb thrust
- B. reduced bleed for pressurization and a slight thrust reduction
- C. automatic deployment of the ram air turbine
- D. a complete loss of cabin pressurization

12. A transport suffers a total loss of all engine-driven generators. The crew flies on standby instruments while the essential buses are powered by:

- A. the air conditioning packs and recirculation fans
- B. the engine-driven hydraulic pumps directly
- C. the transformer rectifier units alone
- D. the battery and the ram air turbine generator

13. A METAR reads "FEW012 SCT025 OVC040." The ceiling at this airport is:

- A. 4,000 feet, the overcast layer
- B. 1,200 feet, the few layer
- C. 2,500 feet, the scattered layer
- D. unlimited, because the layers do not qualify

14. A crew decoding a TAF sees "FM1400 OVC005." This indicates conditions that:

- A. fluctuate temporarily for less than an hour
- B. have a 30 percent probability
- C. change rapidly and completely beginning at 1400Z
- D. change gradually over the whole period

15. A crew briefing for a flight reviews an AIRMET Tango, which specifically addresses:

- A. moderate turbulence and surface winds of 30 knots or more
- B. moderate icing and freezing levels
- C. IFR conditions and mountain obscuration
- D. thunderstorms and associated severe hazards

16. A crew encounters severe clear-air turbulence near a strong jet stream at FL390 with nothing on the radar. The most effective real-time source for anticipating CAT is:

- A. the airborne weather radar at maximum gain
- B. pilot reports (PIREPs)
- C. the surface analysis chart
- D. the terminal aerodrome forecast

17. A crew descending into the destination encounters freezing rain, which the captain identifies as the most hazardous icing because it produces rapid clear ice and indicates:

- A. that the icing conditions have ended below
- B. an absence of supercooled droplets
- C. temperatures well below -30°C
- D. a layer of warmer air aloft

18. A crew encounters volcanic ash at cruise with fluctuating engine indications. The correct immediate response is to:

- A. climb above the ash using maximum thrust
- B. activate the weather radar to navigate around it
- C. continue straight ahead to exit faster
- D. reduce thrust and exit the cloud, typically with a 180° turn

19. A crew flying an RNP approach receives a navigation alert that the system can no longer meet the required accuracy. This self-monitoring capability distinguishes RNP from:

- A. basic RNAV without performance monitoring
- B. an ILS precision approach
- C. a ground-based VOR approach

D. a radar-vectored visual approach

20. A crew at the MDA on a non-precision approach reaches the missed approach point without the runway in sight. The correct action is to:

A. descend 100 feet below the MDA to search

B. execute the missed approach procedure

C. continue descending to the threshold

D. circle below the MDA until the runway appears

21. A crew on an ILS approach reaches the published decision altitude with the runway in sight and the aircraft in a position to land. At the DA, the crew:

A. levels off and holds for better cues

B. descends an extra 100 feet to confirm

C. executes the missed approach regardless

D. continues the approach and lands

22. A crew computing the maximum FDP has a report time of 0300 with five segments. The captain correctly anticipates:

A. the longest possible FDP, due to light traffic

B. an FDP unaffected by report time

C. one of the shortest FDPs, due to the circadian low and many segments

D. a moderate FDP based on segment count alone

23. A crew suffers a loss of pressurization at FL370. The immediate first action, dictated by a time of useful consciousness of only seconds, is to:

A. don oxygen masks and establish crew communication

- B. request a descent from ATC
- C. brief the passengers
- D. troubleshoot the pressurization controller

24. A jet cruises at a true airspeed of 490 knots where the local speed of sound is 583 knots. Its Mach number is approximately:

- A. 0.74
- B. 0.79
- C. 0.84
- D. 0.90

25. A crew encounters a windshear escape situation on final and applies maximum thrust. During the escape, the crew must NOT:

- A. follow the flight-director or stick-shaker pitch
- B. change the configuration by moving gear or flaps
- C. add energy to climb away from the shear
- D. maintain wings-level flight

26. A crew at high altitude stalls during turbulence. The captain recovers primarily by:

- A. applying maximum thrust to power out
- B. reducing the angle of attack and accepting altitude loss
- C. increasing back pressure to hold altitude
- D. banking steeply to unload the wing

27. A crew detects an engine fire warning after takeoff, past V1. After continuing and completing the memory items, the captain's plan is to:

- A. continue to the scheduled destination
- B. climb to cruise and finish paperwork
- C. land as soon as possible at a suitable airport
- D. hold until the warning extinguishes

28. A crew reviewing the engine-fire memory items lists closing the thrust lever, cutting off fuel and the engine, and:

- A. discharging the fire extinguisher into that engine
- B. increasing thrust to blow out the fire
- C. restarting the affected engine immediately
- D. descending below 10,000 feet first

29. A pilot reviewing the swept wing explains that it tends to stall first at the wingtips, producing a nose-up pitch because the tips are:

- A. forward of the center of gravity
- B. over the main landing gear
- C. ahead of the leading-edge slats
- D. located aft of the center of gravity

30. A pilot reviewing aerodynamics explains that L/D MAX, the speed of minimum total drag, governs maximum range, best glide, and:

- A. the never-exceed speed in cruise
- B. the minimum control speed in the air
- C. the maximum operating Mach number
- D. best engine-out driftdown performance

31. A pilot reviewing the relationship between density altitude and performance explains that high density altitude:

- A. reduces engine thrust and aerodynamic performance
- B. increases the wing's coefficient of lift
- C. raises available engine thrust
- D. lowers the true airspeed required for liftoff

32. A pilot reviewing RVSM explains it provides 1,000-foot vertical separation between:

- A. the surface and FL180
- B. FL180 and FL290
- C. FL290 and FL410
- D. FL410 and FL600

33. A pilot reviewing icing protection explains that pitot tubes and static ports are protected from ice by:

- A. hot bleed air from the engine compressors
- B. electrical heating elements
- C. pneumatic boots that crack off ice
- D. a weeping chemical anti-icing fluid

34. A crew reviewing the certificate pathways notes a qualifying graduate of an approved four-year aviation degree program may be issued a Restricted ATP at:

- A. 1,000 hours
- B. 1,250 hours
- C. 1,500 hours
- D. 750 hours

35. A pilot reviewing pressurization control explains that cabin pressure is regulated primarily by the:

- A. inflow rate of bleed air from the packs
- B. outflow valve metering air leaving the cabin
- C. engine compressor bleed pressure
- D. emergency ram-air ventilation door

36. A pilot reviewing weather references explains that winds-aloft forecasts are referenced to true north, while tower-reported surface winds are referenced to:

- A. the runway centerline heading
- B. the aircraft's gyrocompass
- C. grid north at all latitudes
- D. magnetic north

37. Using a surface temperature of $+15^{\circ}\text{C}$ and the standard lapse rate of 2°C per 1,000 feet, the approximate temperature at FL340 (34,000 feet) is:

- A. -25°C
- B. -37°C
- C. -53°C
- D. -56°C

38. A pilot reviewing the relationship between systems and DC power explains that DC power is produced from AC power by:

- A. static inverters
- B. the ram air turbine alone
- C. transformer rectifier units (TRUs)

D. the engine-driven hydraulic pumps

39. A pilot reviewing the relationship between aerodynamics and high-speed flight explains that Mach buffet is produced by:

A. the yaw damper applying excessive rudder

B. ice on the wing leading edge

C. fuel sloshing in partially filled tanks

D. airflow separating behind a shock wave and striking the tail

40. A pilot reviewing the relationship between weather and the SIGMET explains that a non-convective SIGMET advises all aircraft of:

A. severe icing, severe turbulence, and volcanic ash

B. moderate icing and freezing levels only

C. IFR ceilings and mountain obscuration

D. thunderstorms exclusively

41. A pilot reviewing the relationship between regulations and operational control explains that in domestic Part 121, operational control is:

A. shared jointly between the PIC and the dispatcher

B. held solely by the captain once airborne

C. delegated entirely to air traffic control

D. retained exclusively by the chief pilot

42. A pilot reviewing alternate planning needs an airport served only by a non-precision approach. The standard alternate minimums to list it are:

A. a 600-foot ceiling and 2 statute miles

- B. an 800-foot ceiling and 2 statute miles
- C. a 400-foot ceiling and 1 statute mile
- D. a 1,000-foot ceiling and 3 statute miles

43. A pilot reviewing the relationship between regulations and currency explains that PIC currency for carrying passengers requires, in the same category and class:

- A. six instrument approaches within 6 months
- B. a flight review within 12 months only
- C. a logbook endorsement before each flight
- D. three takeoffs and landings within the preceding 90 days

44. A turbojet's actual landing distance over the 50-foot threshold on a wet runway is 4,550 feet. Under the 70 percent wet-runway dispatch factor, the minimum effective runway length required is:

- A. 4,550 feet
- B. 5,460 feet
- C. 6,500 feet
- D. 7,000 feet

45. A pilot reviewing the jet stream explains that, by definition, its core winds are at least:

- A. 25 knots
- B. 50 knots
- C. 75 knots
- D. 100 knots

46. A pilot reviewing automation discipline explains that the correct response to an automation surprise is to:

- A. re-engage a higher level of automation
- B. disconnect it and hand-fly while diagnosing
- C. continue monitoring without intervening
- D. cycle the autopilot circuit breaker repeatedly

47. A pilot reviewing the relationship between systems and ice protection explains that wing and engine anti-ice on most jets is provided by:

- A. electrical heating elements in the leading edge
- B. a chemical fluid weeping through panels
- C. pneumatic boots that inflate cyclically
- D. hot bleed air ducted through the leading edges and inlets

48. A pilot reviewing the relationship between weather and fronts explains that a cold front, compared with a warm front, produces:

- A. a narrow band of intense, showery weather that clears quickly
- B. a wide area of stratiform clouds and steady rain
- C. persistent low ceilings and fog
- D. gradual clearing over many hours

49. A pilot reviewing the relationship between aerodynamics and altitude explains that a climbing jet at constant true airspeed sees its Mach number:

- A. decrease, because density is lower at altitude
- B. remain constant, because TAS is unchanged
- C. increase, because the speed of sound decreases with falling temperature
- D. change only if the outside air warms

50. A pilot reviewing the relationship between CRM and workload explains that the dangerous failure mode where a crew neglects to fly the aircraft while absorbed in a problem is called:

- A. task saturation or fixation
- B. closed-loop communication
- C. threat-and-error management
- D. a shallow authority gradient

51. A pilot reviewing the certificate framework explains that the ATP aeronautical knowledge requirements are contained in:

- A. 14 CFR §91.103
- B. 14 CFR §121.333
- C. 14 CFR §135.243
- D. 14 CFR §61.155

52. A crew reviewing the dispatch release knows it must specify, in addition to route and weather, the alternate(s) and the:

- A. names of all cabin crew
- B. minimum fuel for the flight
- C. complete maintenance history
- D. expected passenger load factor

53. A pilot reviewing the relationship between aerodynamics and the drag curve explains that below L/D MAX, the drag component that dominates and increases is:

- A. parasite drag, which rises with the square of velocity
- B. wave drag from an early shock wave
- C. induced drag, which rises as airspeed decreases

D. interference drag, independent of speed

54. A pilot reviewing the relationship between regulations and reduced thrust explains that reduced-thrust takeoffs are prohibited when the runway is:

- A. dry but shorter than the balanced field length
- B. wet with good braking action
- C. contaminated with snow, slush, or standing water
- D. at a high-elevation airport

55. A pilot reviewing the relationship between systems and the FMS explains that the FMS determines aircraft position by:

- A. blending sensors such as GPS and inertial reference
- B. relying solely on a single VOR/DME
- C. using the standby instruments as the primary reference
- D. averaging the crew's manual entries

56. A pilot reviewing the relationship between weather and pressure systems explains that a low-pressure system in the Northern Hemisphere has air that is:

- A. descending and diverging, producing fair weather
- B. circulating clockwise and outward
- C. stationary, producing clear skies
- D. rising and converging, producing clouds and precipitation

57. A pilot reviewing the relationship between aerodynamics and the chordwise airflow explains that the chordwise component on a swept wing is responsible for:

- A. producing most of the lift at low speed

- B. triggering compressibility effects over the wing
- C. relieving wing-bending stress at the root
- D. damping the Dutch roll oscillation

58. A pilot reviewing the relationship between regulations and the medical certificate explains that a Part 121 PIC must hold:

- A. a first-class medical certificate
- B. a second-class medical certificate
- C. a third-class medical certificate
- D. any class, provided it is current

59. A pilot reviewing the relationship between aeromedical factors and hypoxia explains that hypoxia from carbon monoxide poisoning, where the blood cannot carry oxygen, is classified as:

- A. hypoxic hypoxia
- B. stagnant hypoxia
- C. hypemic hypoxia
- D. histotoxic hypoxia

60. A pilot reviewing the relationship between regulations and fatigue explains that the minimum rest before a flight duty period under Part 117 is:

- A. 8 hours, with a 6-hour sleep opportunity
- B. 9 hours, with a 7-hour sleep opportunity
- C. 12 hours, with a 10-hour sleep opportunity
- D. 10 hours, with an 8-hour sleep opportunity

61. A pilot reviewing the relationship between systems and emergencies explains that a single hydraulic system loss:

- A. eliminates all flight control authority
- B. leaves controllability via the remaining systems and checklist
- C. requires immediate deployment of the ram air turbine
- D. prevents extension of the landing gear by any means

62. A pilot reviewing the relationship between aerodynamics and stability explains that the Dutch roll oscillation, common to swept wings, is suppressed by the:

- A. Mach trim system
- B. stick pusher
- C. yaw damper
- D. autothrottle

63. An aircraft's CG is at fuselage station 912 inches, with the leading edge of the MAC at station 900 and a MAC length of 80 inches. The CG as a percentage of MAC is:

- A. 15 percent MAC
- B. 25 percent MAC
- C. 12 percent MAC
- D. 40 percent MAC

64. A pilot reviewing the relationship between regulations and weather explains that under the 1-2-3 rule, no alternate is required if, within ± 1 hour of the ETA, the ceiling is at least:

- A. 1,500 feet and visibility 2 statute miles
- B. 1,000 feet and visibility 3 statute miles
- C. 3,000 feet and visibility 2 statute miles
- D. 2,000 feet and visibility 3 statute miles

65. A pilot reviewing the relationship between aerodynamics and design explains that sweep raises the critical Mach number by:

- A. increasing the lift produced at low speed
- B. reducing the effective airflow velocity over the wing
- C. eliminating the spanwise airflow entirely
- D. lowering the aircraft's structural weight

66. A pilot reviewing the relationship between regulations and dispatch explains that the dispatcher, working from the ground, has the authority to:

- A. amend or cancel the dispatch release
- B. assume physical control of the aircraft remotely
- C. override ATC clearances during the flight
- D. waive the aircraft's airworthiness requirements

67. A pilot reviewing the relationship between aeromedical factors and disorientation explains that the only reliable defense against spatial disorientation is to:

- A. rely on bodily sensations of attitude
- B. trust and fly by reference to the flight instruments
- C. close the eyes momentarily to reset the inner ear
- D. increase bank angle to stabilize the inner ear

68. A pilot reviewing the relationship between aerodynamics and the lift equation explains that velocity enters the lift equation as a:

- A. linear term, so doubling speed doubles lift
- B. cube, so doubling speed multiplies lift eightfold
- C. constant unrelated to lift

D. square, so doubling speed quadruples available lift

69. A pilot reviewing the relationship between regulations and the R-ATP explains that a Restricted ATP holder may serve as:

- A. pilot-in-command of a Part 121 air carrier flight
- B. a designated examiner for ATP applicants
- C. second-in-command until reaching 1,500 total hours
- D. a dispatcher with operational control authority

70. A pilot reviewing the relationship between systems and the electrical hierarchy explains that when generating capacity is lost, non-essential loads are automatically shed to:

- A. transfer hydraulic power to the electric pumps
- B. recharge the main battery more quickly
- C. preserve power to the essential and battery buses
- D. increase the total power available

71. A pilot reviewing the relationship between aerodynamics and stall behavior explains that wing fences and vortex generators are installed to:

- A. reduce the swept wing's tendency to stall at the tips first
- B. increase the wing's critical Mach number
- C. eliminate the need for trailing-edge flaps
- D. lower the maximum takeoff weight

72. A pilot reviewing the relationship between regulations and the dispatch release explains that in domestic Part 121, the release must be agreed to by:

- A. the captain alone

- B. both the pilot-in-command and the dispatcher
- C. the chief pilot and the FAA
- D. air traffic control and the dispatcher

73. A pilot reviewing the relationship between weather and fog explains that radiation fog, unlike advection fog, forms in:

- A. windy conditions over a cool surface
- B. warm moist air moving over a cooler surface
- C. warm rain falling through cooler air
- D. calm conditions overnight and burns off with daytime heating

74. A pilot reviewing the relationship between aerodynamics and the engine-out cruise explains that a twin cannot maintain cruise altitude on one engine because the available thrust is:

- A. insufficient to sustain level flight, requiring a driftdown
- B. exactly equal to the thrust required for level flight
- C. more than sufficient to continue climbing
- D. unaffected by the loss of one engine

75. A pilot reviewing the relationship between regulations and the certificate age explains that an unrestricted ATP applicant must be at least:

- A. 18 years old
- B. 23 years old
- C. 21 years old
- D. 25 years old

76. A pilot reviewing the relationship between aeromedical factors and altitude explains that passenger oxygen masks typically deploy automatically at a cabin altitude of approximately:

- A. 8,000 feet
- B. 10,000 feet
- C. 18,000 feet
- D. 14,000 feet

77. A pilot reviewing the relationship between aerodynamics and stability explains that an aft (but legal) CG provides a small benefit of:

- A. a higher stall speed for safety margin
- B. greater longitudinal stability in pitch
- C. slightly improved cruise fuel efficiency
- D. an inability to rotate at the normal speed

78. A pilot reviewing the relationship between regulations and the takeoff distances explains that a clearway at the departure end of a runway extends the:

- A. accelerate-stop distance available (ASDA)
- B. takeoff distance available (TODA)
- C. landing distance available (LDA)
- D. takeoff run available (TORA)

79. A pilot reviewing the relationship between weather and stability explains that stable air, resisting vertical motion, produces:

- A. cumuliform clouds, turbulence, and showers
- B. towering cumulus and good visibility
- C. rapidly building thunderstorms
- D. stratiform clouds, smooth air, and poor visibility

80. A pilot reviewing the relationship between systems and bleed air explains that bleed air is a shared resource used for pressurization, anti-ice, and:

- A. driving the hydraulic engine-driven pumps
- B. charging the main aircraft battery
- C. engine starting
- D. powering the navigation displays

81. A pilot reviewing the relationship between aerodynamics and the takeoff decision speed explains that V_1 is best described as the:

- A. maximum speed at which a reject can still safely stop the aircraft
- B. speed at which the nose is raised to the takeoff attitude
- C. minimum single-engine climb speed at 35 feet
- D. speed at which the landing gear must be retracted

82. A pilot reviewing the relationship between weather products and the GFA explains that the Graphical Forecasts for Aviation is:

- A. an hourly coded surface observation
- B. a 24-hour terminal forecast for one airport
- C. the primary interactive graphical briefing tool for the U.S.
- D. a single static chart valid at one time

83. A pilot reviewing the relationship between aerodynamics and rotation explains that VR , the rotation speed, is always:

- A. less than V_1 to ensure an early liftoff
- B. equal to V_2 at the screen height
- C. independent of takeoff weight

D. equal to or greater than V1

84. A pilot reviewing the relationship between regulations and the convective product explains that a Convective SIGMET, valid for 2 hours, automatically implies:

- A. mountain obscuration and IFR ceilings
- B. severe turbulence, severe icing, and low-level wind shear
- C. light icing at the freezing level only
- D. volcanic ash lowering visibility

85. A pilot reviewing the relationship between aerodynamics and the engine-out climb explains that maximum continuous thrust is the:

- A. highest thrust permitted for unlimited duration
- B. time-limited maximum used only for takeoff
- C. idle thrust setting used in descent
- D. thrust automatically reduced by the autothrottle

86. A pilot reviewing the relationship between regulations and risk explains that risk is assessed by combining:

- A. the time and cost of mitigation
- B. the convenience and effort required
- C. the likelihood and the severity of the hazard
- D. the distance and fuel remaining

87. A pilot reviewing the relationship between weather and the winds aloft forecast explains that a coded group of "9900" indicates wind that is:

- A. light and variable, less than 5 knots

- B. from 099° at 100 knots
- C. calm with zero movement
- D. from due north at 99 knots

88. A pilot reviewing the relationship between regulations and the MEL explains that an operator's MEL, relative to the Master MEL, may be:

- A. less restrictive with a waiver
- B. identical only, with no variation
- C. ignored if the captain deems an item minor
- D. more restrictive, but never less

89. A pilot reviewing the relationship between aeromedical factors and hypoxia explains that hypoxia from impaired blood circulation, such as pooling under G-forces, is classified as:

- A. hypoxic hypoxia
- B. stagnant hypoxia
- C. histotoxic hypoxia
- D. hypemic hypoxia

90. A pilot reviewing the relationship between aerodynamics and the lift equation explains that as air density falls with altitude, to maintain the same lift the wing must:

- A. reduce its true airspeed proportionally
- B. mechanically increase its wing area
- C. reduce its angle of attack to zero
- D. fly at a higher true airspeed for a given indicated airspeed

91. A pilot reviewing the relationship between regulations and currency explains that instrument currency requires, within the preceding 6 calendar months, six approaches, holding, and:

- A. intercepting and tracking courses using navigation systems
- B. two precision approaches in actual conditions
- C. a logged instrument proficiency check
- D. 10 hours of actual instrument time

92. A fuel load of 5,200 gallons at a density of 6.7 pounds per gallon weighs:

- A. 31,200 pounds
- B. 26,800 pounds
- C. 34,840 pounds
- D. 40,000 pounds

93. A pilot reviewing the relationship between weather and icing explains that the most dangerous form of structural icing is:

- A. rime ice from small droplets in colder air
- B. clear (glaze) ice from large supercooled droplets and freezing rain
- C. frost forming overnight on a parked aircraft
- D. a trace of mixed ice in thin stratiform cloud

94. A pilot reviewing the relationship between regulations and the STAR explains that a Standard Terminal Arrival Route transitions an aircraft from:

- A. the runway to the en route structure
- B. one airway to a parallel airway
- C. the holding fix to the missed approach point
- D. the en route structure to the approach environment

95. A pilot reviewing the relationship between aerodynamics and the takeoff climb explains that the first segment extends from liftoff until the:

- A. landing gear is fully retracted
- B. aircraft reaches 1,500 feet AGL
- C. flaps reach the en route setting
- D. final climb speed is reached

96. A pilot reviewing the relationship between regulations and the cabin-altitude warning explains that it typically activates at a cabin altitude of approximately:

- A. 6,000 feet
- B. 14,000 feet
- C. 10,000 feet
- D. 18,000 feet

97. A pilot reviewing the relationship between systems and pressurization explains that the limiting structural parameter is the:

- A. absolute cabin altitude regardless of outside pressure
- B. maximum differential pressure between cabin and outside
- C. total airflow delivered by the packs
- D. rate of cabin altitude change during climb only

98. A pilot reviewing the relationship between aerodynamics and the second segment explains that the second-segment climb gradient is most often the:

- A. least restrictive of all climb segments
- B. limiting factor for the maximum takeoff weight
- C. only segment with no gradient requirement

D. segment flown after the flaps are fully retracted

99. A pilot reviewing the relationship between regulations and the dispatch release explains that the flight may not depart without:

A. a valid release agreed to by both the captain and the dispatcher

B. a passenger manifest signed by the gate agent

C. an ATC clearance matching the release exactly

D. the chief pilot's personal signature

100. A pilot reviewing the relationship between weather and CAT explains that clear air turbulence is most severe on the:

A. warm (equatorial) side of the jet stream

B. surface beneath the jet stream

C. far downstream edge of the jet stream

D. cold (polar) side of the jet stream, near the core

101. A pilot reviewing the relationship between aerodynamics and high-altitude stall explains that the high-altitude stall recovery, unlike at low altitude, prioritizes:

A. applying maximum thrust to power out

B. maintaining altitude while increasing back pressure

C. banking steeply to unload the wing

D. reducing the angle of attack and accepting altitude loss

102. A pilot reviewing the relationship between regulations and the approach explains that a Decision Altitude is used on approaches providing:

A. lateral guidance only with stepdown fixes

- B. radar vectors to a visual final segment
- C. vertical guidance, such as an ILS or LPV
- D. circling guidance to a non-aligned runway

103. A pilot reviewing the relationship between weather and thunderstorms explains that hail and severe turbulence can be encountered:

- A. only within the visible precipitation core
- B. only above the anvil at the storm top
- C. in clear air beneath and beside the storm
- D. exclusively during the dissipating stage

104. A pilot reviewing the relationship between systems and ram air explains that the ram air turbine (RAT):

- A. provides cabin pressurization air during cruise
- B. provides emergency hydraulic and/or electrical power when normal sources fail
- C. cools the air conditioning packs
- D. supplies bleed air for wing anti-ice

105. A pilot reviewing the relationship between aerodynamics and the moist adiabatic lapse rate explains that it is lower than the dry rate because:

- A. condensation releases latent heat that partly offsets cooling
- B. saturated air is denser and cools faster
- C. the moist rate applies only above the tropopause
- D. water vapor speeds the temperature decrease

106. A pilot reviewing the relationship between regulations and the takeoff distances explains that a stopway extends the:

- A. takeoff distance available (TODA)
- B. landing distance available (LDA)
- C. accelerate-stop distance available (ASDA)
- D. takeoff run available (TORA)

107. A pilot reviewing the relationship between CRM and communication explains that closed-loop communication means that:

- A. only the captain may issue operational commands
- B. radio calls are made by the pilot flying only
- C. communication is limited to essential ATC exchanges
- D. the receiver confirms the message so the sender knows it was understood

108. A pilot reviewing the relationship between aerodynamics and engine indications explains that the parameter protecting against turbine overtemperature is:

- A. exhaust gas temperature (EGT)
- B. fan rotational speed (N1)
- C. engine pressure ratio (EPR)
- D. high-pressure spool speed (N2)

109. A pilot reviewing the relationship between regulations and emergency descent explains that during an emergency descent after an explosive decompression with suspected structural damage, the crew should:

- A. descend at the maximum operating speed regardless
- B. maintain cruise altitude until repressurized
- C. extend the gear as the only means of descent
- D. reduce speed to avoid aggravating the damage

110. A pilot reviewing the relationship between aerodynamics and the standard atmosphere explains that the tropopause, where temperature stops decreasing, is associated with a temperature of approximately:

- A. 0°C near 18,000 feet
- B. -56.5°C near 36,000 feet
- C. -40°C near 30,000 feet
- D. -15°C near 25,000 feet

111. A pilot reviewing the relationship between weather and the temperature inversion explains that an inversion is a layer in which temperature:

- A. decreases rapidly, producing instability
- B. increases with altitude, producing very stable air
- C. remains constant, producing neutral stability
- D. oscillates, producing alternating cloud layers

112. A pilot reviewing the relationship between aerodynamics and efficiency explains that the most fuel-efficient long-range cruise involves climbing to higher altitudes as fuel burns off, a procedure called the:

- A. driftdown profile
- B. optimized profile descent
- C. step climb
- D. cruise-descent transition

113. A pilot reviewing the relationship between regulations and the DECIDE model explains that the model is a continuous loop ending in:

- A. evaluate the effect of the action taken
- B. eliminate all remaining risk
- C. execute the chosen procedure

D. endorse the decision in the logbook

114. A pilot reviewing the relationship between aerodynamics and the swept wing explains that sweep reduces the lift produced for a given angle of attack at low speed because the wing experiences:

- A. a higher effective airspeed
- B. a lower effective airspeed
- C. an increased air density
- D. an eliminated boundary layer

115. A pilot reviewing the relationship between regulations and the certificate explains that the ATP certificate is governed by:

- A. 14 CFR Part 121
- B. 14 CFR Part 91
- C. 14 CFR Part 135
- D. 14 CFR Part 61

116. A pilot reviewing the relationship between weather and the winds aloft forecast explains that no wind or temperature is forecast for a level within:

- A. 1,500 feet of the station elevation
- B. 500 feet of the station elevation
- C. 3,000 feet of the station elevation
- D. 5,000 feet of the station elevation

117. A pilot reviewing the relationship between systems and pressurization explains that typical cruise cabin altitude on a transport at high cruise is maintained around:

- A. sea level to 2,000 feet

- B. 10,000 to 12,000 feet
- C. 6,000 to 8,000 feet
- D. equal to the actual flight altitude

118. A pilot reviewing the relationship between CRM and the authority gradient explains that a gradient that is too steep:

- A. provides ideal command authority and crew balance
- B. has no effect on flight-deck communication
- C. suppresses the first officer's willingness to speak up
- D. encourages excessive input from the first officer

119. A pilot reviewing the relationship between aerodynamics and the forward CG explains that a forward CG raises the stall speed because:

- A. it shifts the center of lift aft of the wing
- B. the increased tail download effectively increases the load the wing must support
- C. it decreases the wing's coefficient of lift directly
- D. it reduces the aircraft's total weight in flight

120. A pilot reviewing the relationship between regulations and the hazardous attitudes explains that the antidote to the "impulsivity" attitude ("do something quickly") is:

- A. not so fast; think first
- B. follow the rules; they are usually right
- C. it could happen to me
- D. I'm not helpless

121. A weight of 6,000 lb is shifted 200 inches on an aircraft with a total weight of 120,000 lb. The CG moves:

- A. 10 inches
- B. 16 inches
- C. 12 inches
- D. 8 inches

122. A pilot reviewing the relationship between aerodynamics and Mach tuck explains that Mach tuck is:

- A. a coupled roll-yaw oscillation near the tropopause
- B. airframe vibration from separated airflow
- C. an uncommanded roll at high Mach
- D. a nose-down pitch from the rearward shift of the center of lift

123. A pilot reviewing the relationship between regulations and the hazardous attitudes explains that the antidote to the "anti-authority" attitude ("don't tell me") is:

- A. it could happen to me
- B. not so fast; think first
- C. follow the rules; they are usually right
- D. taking chances is foolish

124. A pilot reviewing the relationship between aerodynamics and stability explains that an aft CG reduces longitudinal stability because:

- A. it increases the required tail download
- B. it raises the stall speed
- C. it moves the center of lift forward
- D. the center of gravity moves closer to the center of lift, reducing the stabilizing moment

125. A pilot reviewing the relationship between weather and the standard atmosphere explains that within the troposphere, temperature generally:

- A. increases with increasing altitude
- B. decreases with increasing altitude
- C. remains constant with altitude
- D. fluctuates randomly with no trend

Answer Key

1. A — CG equals total moment \div total weight: $71,400,000 \div 120,000 = 595$ inches aft of datum. This division is the core of every weight-and-balance computation.
2. D — When the second-segment gradient limits takeoff weight, using a runway with greater length and better conditions can raise the allowable weight (conditions permitting). Reduced thrust would lower, not raise, performance margin.
3. C — Driftdown is flown at L/D MAX to minimize the rate of descent, allowing the aircraft to level off as high as possible on one engine — critical over terrain. A twin cannot usually hold cruise altitude on one engine.
4. A — A swept wing produces less low-speed lift and high density altitude reduces thrust and aerodynamic performance; together they increase the speed and distance required to become airborne. Both effects degrade takeoff performance.
5. B — The second segment, the most critical, requires a minimum gradient of 2.4 percent for a two-engine transport. It is flown at V2 with takeoff flaps and frequently limits takeoff weight.
6. C — The coffin corner is dangerous because the low-speed stall and high-speed Mach boundaries converge, leaving only a few knots of margin. Any load-factor increase can trigger stall or Mach buffet.
7. B — A high-Mach nose-down pitch is Mach tuck; reducing speed corrects it, and the Mach trim system normally prevents the tendency by compensating automatically. The pitch is self-reinforcing if uncorrected.

8. A — During an engine-out continued takeoff, the most immediate handling concern is maintaining directional control against asymmetric thrust, which can overcome rudder authority below VMCA. Drag reduction comes later.

9. C — Domestic Part 121 fuel must reach the destination, then the most distant alternate, then provide 45 minutes at normal cruise consumption. The reserve is added after the alternate, not held at the destination.

10. D — The maximum zero fuel weight caps non-fuel weight before fuel is loaded, protecting the wing root: payload increases wing-bending stress while wing fuel relieves it. The other limits apply at different points.

11. B — Wing anti-ice draws bleed air, reducing what is available for pressurization and slightly lowering thrust. This cross-system dependency is a managed trade, not a thrust increase or pressurization loss.

12. D — In a total loss of engine-driven generators, the battery and ram air turbine generator power the essential buses while the crew flies on standby instruments. The packs, hydraulic pumps, and TRUs cannot substitute.

13. A — A ceiling is the lowest broken or overcast layer; here the only such layer is OVC040, making the ceiling 4,000 feet. Few and scattered layers (FEW012, SCT025) never constitute a ceiling.

14. C — A TAF "FM" (FROM) group indicates a rapid, complete change to the stated conditions beginning at the stated time (1400Z). TEMPO is brief fluctuation, BECMG is gradual, and PROB is a probability.

15. A — AIRMET Tango specifically addresses moderate turbulence, sustained surface winds of 30 knots or more, and low-level wind shear. Sierra covers IFR/obscuration and Zulu covers icing.

16. B — Clear air turbulence is invisible and radar-undetectable, so PIREPs are the best real-time source for anticipating it. Forecasts help, but direct pilot reports are the most valuable.

17. D — Freezing rain indicates a layer of warmer air aloft and produces rapid clear ice, making it the most hazardous icing condition. It signals worsening, not improving, conditions.

18. D — Encountering volcanic ash calls for immediately reducing thrust and exiting the cloud, typically with a 180° turn. Ash melts in the engine hot section and is radar-invisible, so climbing through or using radar is wrong.

19. A — RNP's defining feature, which basic RNAV lacks, is on-board performance monitoring and alerting. An ILS or VOR approach is not the comparison point.

20. B — If the runway environment is not in sight at the missed approach point, the crew must execute the missed approach. Descending below the MDA without references is prohibited.

21. D — At the decision altitude with the runway in sight and the aircraft in a position to land, the crew continues the approach and lands. The DA is a go/no-go point.

22. C — A 0300 report (deep in the circadian low) with five segments yields one of the shortest maximum FDPs, because both the early start and many segments increase fatigue. Favorable daytime starts with few segments are longest.

23. A — In a high-altitude loss of pressurization, the immediate first action is to don oxygen masks and establish crew communication, because the time of useful consciousness may be only seconds. Troubleshooting and ATC calls follow.

24. C — Mach number is $TAS \div \text{local speed of sound}$: $490 \div 583 \approx 0.84$. This places the aircraft in the high subsonic cruise range.

25. B — During a windshear escape the crew must NOT change configuration (gear or flaps); they apply maximum thrust, follow the flight-director/stick-shaker pitch, and maintain wings level. Configuration changes during the escape are hazardous.

26. B — High-altitude stall recovery prioritizes reducing the angle of attack and accepting altitude loss, because thin air provides little excess thrust. Pulling or relying on thrust can deepen the stall.

27. C — After continuing an engine-fire takeoff past V1 and completing the memory items, the crew plans to land as soon as possible at a suitable airport. Fire is a land-immediately emergency.
28. A — The engine-fire memory items include closing the thrust lever, cutting off fuel and the engine via the fire handle, and discharging the fire extinguisher into that engine. A second bottle follows if the warning persists.
29. D — A swept wing stalls at the tips first; because the tips are located aft of the center of gravity, losing lift there shifts the center of lift forward and pitches the nose up. Wing fences mitigate this.
30. D — L/D MAX, the speed of minimum total drag, governs maximum range, best glide, and best engine-out driftdown performance. The same efficiency speed serves all three.
31. A — High density altitude (hot, high field) reduces both engine thrust and aerodynamic performance because the air is less dense. This degrades takeoff performance.
32. C — RVSM provides 1,000-foot vertical separation between FL290 and FL410, nearly doubling usable altitudes. It requires approved altitude-keeping equipment and operator authorization.
33. B — Pitot tubes and static ports are electrically heated to keep flight data accurate. Unheated pitot-static sensors can produce dangerously erroneous airspeed and altitude indications.
34. A — A qualifying graduate of an approved four-year aviation degree program may be issued the R-ATP at 1,000 hours. The two-year threshold is 1,250 hours and military is 750 hours.
35. B — Cabin pressure is regulated mainly by the outflow valve, which meters air leaving the cabin; inflow from the packs is relatively constant. Closing the valve raises pressure, opening it lowers it.
36. D — Tower-reported surface winds are referenced to magnetic north, whereas winds aloft forecasts use true north. Recognizing which reference applies prevents heading errors.

37. C — Using 2°C per 1,000 feet from $+15^{\circ}\text{C}$: $15 - (2 \times 34) = 15 - 68 = -53^{\circ}\text{C}$ at 34,000 feet. The standard lapse rate gives a straightforward linear estimate.
38. C — DC power is produced from AC through Transformer Rectifier Units (TRUs). Static inverters do the reverse (DC to AC) for essential AC loads.
39. D — Mach buffet results from airflow separating behind the shock wave that forms past critical Mach, with the turbulent flow striking the tail. It is the high-speed counterpart to low-speed stall buffet.
40. A — A non-convective SIGMET advises all aircraft of severe icing, severe or extreme turbulence, clear air turbulence, dust/sand storms, and volcanic ash. AIRMETs cover the moderate end.
41. A — In domestic Part 121 operations, operational control is shared jointly between the PIC and the dispatcher; both must agree to the release and either can stop or divert the flight.
42. B — Standard alternate minimums for a non-precision approach are an 800-foot ceiling and 2 statute miles visibility (600-2 for precision). These differ from the destination 1-2-3 trigger.
43. D — PIC currency for carrying passengers requires three takeoffs and landings within the preceding 90 days in the same category and class. The six-approach rule is instrument currency, a separate requirement.
44. C — Under the 70 percent wet-runway factor, the required runway length is the actual landing distance $\div 0.7$: $4,550 \div 0.7 = 6,500$ feet. The wet factor is more conservative than the 60 percent dry factor.
45. B — By definition, jet stream core winds are 50 knots or greater, frequently exceeding 100. Jet streams form along sharp temperature boundaries near the tropopause.
46. B — The correct response to an automation surprise is to disconnect it and hand-fly while diagnosing the problem. Automation does what it is told, not always what the crew intended.

47. D — Wing and engine anti-ice on most jets uses hot bleed air ducted through the leading edges and inlets — a thermal system. Windshields and probes use electrical heat instead.

48. A — A cold front produces a narrow band of intense, showery weather that clears quickly, with cumuliform clouds and gusty winds. Warm fronts produce the wide stratiform decks and steady rain.

49. C — A climbing jet's Mach number increases at constant true airspeed because the speed of sound decreases with falling temperature. A jet can approach its Mach limit just by climbing.

50. A — Task saturation or fixation is the dangerous failure mode where a crew becomes so absorbed in one problem that they neglect to fly the aircraft. It has caused controlled-flight-into-terrain accidents.

51. D — The ATP aeronautical knowledge requirements are contained in 14 CFR §61.155, with the multiengine training prerequisite in §61.156. Parts 91/121/135 govern operations.

52. B — The dispatch release must specify the alternate(s) and the minimum fuel for the flight, along with route, weather, and restrictions. It does not record cabin-crew names or load factor.

53. C — Below L/D MAX, induced drag dominates and rises as airspeed decreases and angle of attack increases. This is the back side of the drag curve.

54. C — Reduced-thrust takeoffs are prohibited on contaminated runways (snow, slush, standing water) because the reduced performance margin is unacceptable when braking and acceleration are degraded.

55. A — The FMS blends navigation sensors such as GPS and inertial reference (and radio aids) to determine position. It does not rely on a single station or the standby instruments.

56. D — A low-pressure system has rising, converging air that cools and condenses moisture, producing clouds and precipitation. In the Northern Hemisphere it circulates counterclockwise and inward.

57. B — On a swept wing, the chordwise component of airflow (perpendicular to the leading edge) is responsible for triggering compressibility effects; the spanwise component does not. This is why sweep delays compressibility.

58. A — A Part 121 PIC must hold a first-class medical certificate (and an ATP certificate). The first-class medical is required for air carrier PIC duty.

59. C — Carbon monoxide poisoning produces hypemic hypoxia, in which the blood cannot carry oxygen. It is distinct from hypoxic, stagnant, and histotoxic hypoxia.

60. D — Part 117 requires a minimum 10-hour rest period before a flight duty period, including an opportunity for at least 8 uninterrupted hours of sleep. This replaced the older Part 121 limits.

61. B — A single hydraulic system loss leaves controllability via the remaining independent systems, with degraded functions managed by the appropriate checklist. Redundancy is precisely why one loss is not catastrophic.

62. C — The yaw damper suppresses the Dutch roll oscillation, a coupled roll-yaw motion that wing sweep aggravates. An inoperative yaw damper often restricts altitude.

63. A — Percent MAC = $(CG \text{ arm} - LEMAC) \div MAC \times 100 = (912 - 900) \div 80 \times 100 = 15$ percent MAC. This converts a CG station into a percentage of the mean aerodynamic chord.

64. D — Under the 1-2-3 rule, no alternate is required if, within ± 1 hour of the ETA, the ceiling is at least 2,000 feet and visibility at least 3 statute miles. Both thresholds must be met.

65. B — Sweep raises the critical Mach number by reducing the effective airflow velocity the wing experiences, so local flow reaches Mach 1.0 at a higher actual aircraft Mach number. This is the high-speed benefit of sweep.

66. A — The dispatcher, sharing operational control from the ground, may amend or cancel the dispatch release and prevent or divert the flight. The dispatcher cannot physically fly the aircraft or override ATC.

67. B — The only reliable defense against spatial disorientation is to trust and fly by reference to the flight instruments, since the vestibular senses produce false cues without visual references. "Flying by feel" worsens it.

68. D — In the lift equation, velocity enters as a square, so doubling speed quadruples available lift — and also quadruples parasite drag. This makes speed the dominant variable.

69. C — A Restricted ATP holder may serve only as second-in-command (first officer) until reaching 1,500 total hours. It does not permit Part 121 PIC duty or examiner/dispatcher roles.

70. C — The electrical system sheds non-essential loads when generating capacity is lost in order to preserve power to the essential and battery buses that feed flight-critical systems. Shedding does not create more total power.

71. A — Wing fences and vortex generators control spanwise flow to reduce the swept wing's tendency to stall at the tips first. They do not raise critical Mach, eliminate flaps, or lower takeoff weight.

72. B — In domestic Part 121 operations, the dispatch release must be agreed to by both the pilot-in-command and the dispatcher, reflecting their jointly shared operational control. Either can prevent or divert the flight.

73. D — Radiation fog forms in calm conditions overnight as the ground cools, and it burns off with daytime heating. Advection fog, by contrast, requires wind and warm moist air over a cooler surface.

74. A — At high cruise altitude on one engine, the available thrust is insufficient to sustain level flight, requiring a driftdown to a lower sustainable altitude. This is the basis of engine-out cruise planning.

75. B — An applicant for an unrestricted ATP certificate must be at least 23 years old (21 for a restricted ATP). This age requirement is a frequently tested recall item.

76. D — Passenger oxygen masks typically deploy automatically at about 14,000 feet cabin altitude. The cabin-altitude warning to the crew activates earlier, around 10,000 feet.

77. C — An aft (but legal) CG reduces tail download and trim drag, slightly improving cruise fuel efficiency. The trade-off is reduced longitudinal stability.

78. B — A clearway extends the takeoff distance available (TODA); a stopway extends the accelerate-stop distance available (ASDA). Knowing which surface extends which distance is a tested distinction.

79. D — Stable air resists vertical motion, producing stratiform clouds, smooth air, and poor visibility from trapped haze and fog. Unstable air produces the cumuliform clouds and turbulence of the other options.

80. C — Bleed air is a shared resource used for pressurization, anti-ice, and engine starting. It does not drive the hydraulic engine-driven pumps, charge the battery, or power the displays.

81. A — V_1 is the takeoff decision speed: the maximum speed at which a reject can still safely stop the aircraft within the available distance. At or after V_1 the takeoff must be continued.

82. C — The Graphical Forecasts for Aviation (GFA) is the primary interactive graphical briefing tool for the continental U.S., presenting observations and forecasts across time and altitude. It has largely replaced older static products.

83. D — VR, the rotation speed, is always equal to or greater than V_1 , ensuring rotation does not begin before the decision speed. Rotating too early risks a tail strike or liftoff below a safe speed.

84. B — A Convective SIGMET automatically implies severe turbulence, severe icing, and low-level wind shear, so those are not issued separately. It is valid for 2 hours over the contiguous U.S.

85. A — Maximum continuous thrust is the highest thrust permitted for unlimited duration and is the relevant ceiling during engine-out climb. Takeoff thrust, by contrast, is time-limited.

86. C — Risk is assessed by combining the likelihood and the severity of a hazard. Pairing the wrong two factors (time/cost, convenience/effort, distance/fuel) is a common distractor.

87. A — A winds aloft coded group of 9900 means the wind is light and variable, defined as less than 5 knots. It is not a numerical direction or speed.

88. D — An operator's MEL may be more restrictive than the manufacturer's Master MEL, but never less. An item not addressed or required to be operative makes the aircraft un-dispatchable.

89. B — Stagnant hypoxia results from impaired blood circulation, such as blood pooling under G-forces. It is distinct from hypoxic, hypemic, and histotoxic hypoxia.

90. D — As density falls with altitude, the wing must fly at a higher true airspeed for a given indicated airspeed to maintain lift. This is why a jet's TAS far exceeds its indicated airspeed at altitude.

91. A — Instrument currency (the "6-HIT") requires, within the preceding 6 calendar months, six approaches, holding, and intercepting and tracking courses using navigation systems. It need not be in actual conditions.

92. C — Fuel weight equals gallons \times density: $5,200 \times 6.7 = 34,840$ pounds. Converting volume to weight is essential for accurate weight-and-balance and performance planning.

93. B — Clear (glaze) ice from large supercooled droplets and freezing rain is the most dangerous structural icing — heavy, hard, smooth, and tenacious. Rime, frost, and a trace of mixed ice are less dangerous.

94. D — A STAR transitions an aircraft from the en route structure to the approach environment, often with published crossing altitudes and speeds. A SID does the reverse after takeoff.

95. A — The first takeoff climb segment extends from liftoff (35 feet) until the landing gear is fully retracted, flown at takeoff thrust with takeoff flaps. Its minimum gradient for a twin is positive.

96. C — A cabin-altitude warning typically activates at about 10,000 feet cabin altitude, alerting the crew before hypoxia becomes severe. Masks deploy later, around 14,000 feet.

97. B — The limiting structural parameter for pressurization is the maximum differential pressure between cabin and outside, since the structure can only withstand so much pressure difference. Pressurization is scheduled never to exceed it.

98. B — The second-segment climb gradient is most often the limiting factor for the maximum takeoff weight, because it is the most demanding engine-out segment. It is not the least restrictive or flaps-up segment.

99. A — The flight may not depart without a valid release agreed to by both the captain and the dispatcher, reflecting their jointly shared operational control. ATC clearance and the chief pilot's signature are not the requirement.

100. D — Clear air turbulence is most severe on the cold (polar) side of the jet stream, near the core, where wind shear is greatest. It is also associated with the tropopause and mountain waves.

101. D — High-altitude stall recovery prioritizes reducing the angle of attack and accepting altitude loss, because thin air provides little excess thrust to power out. Pulling or relying on thrust can deepen the stall.

102. C — A Decision Altitude is used on approaches providing vertical guidance, such as an ILS or LPV; the pilot decides to land or go around at the DA. Non-precision approaches use an MDA.

103. C — Hail and severe turbulence can be encountered in clear air beneath and beside a thunderstorm, not just inside it — hail can be thrown miles under the anvil. This is why wide avoidance is required.

104. B — The ram air turbine deploys into the airstream to provide emergency hydraulic and/or electrical power when normal sources fail. It is a last-resort backup, not a normal-operations source.

105. A — The moist adiabatic lapse rate is lower than the dry rate because condensation in saturated rising air releases latent heat that partly offsets the cooling. This is why saturated parcels cool more slowly.

106. C — A stopway extends the accelerate-stop distance available (ASDA); a clearway extends the takeoff distance available (TODA). Knowing which surface extends which distance is a tested distinction.

107. D — Closed-loop communication means the receiver confirms the message so the sender knows it was understood — the same principle as an ATC readback. It prevents miscommunication.

108. A — EGT (exhaust gas temperature) is the parameter protecting against turbine overtemperature. Thrust is set with N1 or EPR, not EGT.

109. D — When an explosive decompression may have caused structural damage, the crew reduces speed during the emergency descent to avoid aggravating the damage. Normally the descent is flown at maximum appropriate speed.

110. B — In the standard atmosphere, the tropopause near 36,000 feet is where temperature stops decreasing at approximately -56.5°C . Above it, in the stratosphere, temperature is initially isothermal.

111. B — A temperature inversion is a layer where temperature increases with altitude, the reverse of normal, producing very stable air that traps moisture and pollutants and reduces visibility.

112. C — As fuel burns off and the aircraft lightens, the optimum altitude rises, so long flights step to higher altitudes — the step climb — to stay near the most efficient profile. Driftdown is an engine-out descent.

113. A — The DECIDE model ends in Evaluate — assessing the effect of the action taken, which makes it a continuous loop. The steps are Detect, Estimate, Choose, Identify, Do, Evaluate.

114. B — Sweep causes the wing to experience a lower effective airspeed, reducing the lift generated for a given angle of attack at low speed. This is the low-speed penalty of sweep.

115. D — The ATP certificate is governed by 14 CFR Part 61, with knowledge requirements in §61.155. Parts 91/121/135 govern operations, not the certificate itself.

116. A — No wind or temperature is forecast for a winds aloft level within 1,500 feet of the station elevation. Temperatures are also omitted for levels within 2,500 feet of the station.

117. C — Typical cruise cabin altitude on a transport at high cruise is maintained around 6,000 to 8,000 feet, far below the actual flight altitude, to keep occupants comfortable and safe.

118. C — An authority gradient that is too steep (an intimidating captain) suppresses the first officer's willingness to speak up. A healthy gradient keeps clear command while encouraging input.

119. B — A forward CG requires more tail download, which effectively increases the load the wing must support, raising the stall speed. It also increases drag and fuel burn while improving stability.

120. A — The antidote to the impulsivity attitude ("do something quickly") is "not so fast; think first." Recognizing the attitude precedes applying the antidote.

121. A — CG shift equals (weight moved \times distance moved) \div total weight: $(6,000 \times 200) \div 120,000 = 10$ inches. The CG moves toward the direction of the shift.

122. D — Mach tuck is a nose-down pitch from the rearward shift of the center of lift as a shock wave forms. It is distinct from Dutch roll, Mach buffet, and high-Mach roll-off.

123. C — The antidote to the anti-authority attitude ("don't tell me") is "follow the rules; they are usually right." Each hazardous attitude has a specific antidote.

124. D — An aft CG moves the center of gravity closer to the center of lift, reducing the stabilizing moment and longitudinal stability. This makes the aircraft more sensitive in pitch.

125. B — Within the troposphere, temperature generally decreases with altitude, which is why essentially all weather occurs in this layer. The decrease stops at the tropopause.