

PRACTICE EXAM 28 (60 QUESTIONS)

1. A pilot in cruise IMC observes the airspeed reading slowly decreasing toward zero while the altimeter and VSI continue to function normally. What is the most likely cause?

- A. A static port blockage
- B. A vacuum pump failure
- C. An electrical bus failure
- D. A blocked pitot tube with an open drain

2. A pilot notes the altimeter is frozen, the VSI reads zero, and the airspeed is inaccurate, all simultaneously. Which single failure explains all three symptoms?

- A. A blocked static port
- B. A blocked pitot tube only
- C. A vacuum failure
- D. A failed attitude indicator

3. A pilot's attitude indicator shows a gentle climbing right turn, but the turn coordinator is level, the altimeter is steady, and the airspeed is constant. The vacuum gauge reads low. What has failed?

- A. The turn coordinator
- B. The static system
- C. The pitot tube
- D. The vacuum-driven attitude indicator

4. A pilot flying into colder air without resetting the altimeter finds, upon landing at a cold airport, that true altitude was lower than indicated throughout. What caused this?

- A. The pitot tube contracted in the cold
 - B. The altimeter setting changed automatically
 - C. The airspeed indicator over-read
 - D. Cold, dense air lowers true altitude for a given indication, and the altimeter cannot sense temperature
5. A pilot sees the airspeed indicator behaving like an altimeter—rising in the climb and falling in the descent. What does this symptom indicate?
- A. A static port blockage with a clear pitot tube
 - B. A vacuum failure
 - C. Both the pitot tube and its drain are blocked
 - D. A failed vertical speed indicator
6. A pilot in a turn onto a northerly heading finds the magnetic compass lagging behind the actual heading. What causes this behavior?
- A. Electrical interference from the avionics
 - B. Precession of the compass float
 - C. Compass fluid freezing
 - D. Magnetic dip pulling the compass card, producing turning error
7. A pilot observes that as the aircraft climbs at a constant indicated airspeed, its true airspeed increases. What is the cause?
- A. The pitot tube becomes more efficient
 - B. Static pressure increases with altitude
 - C. The airspeed indicator mechanically over-reads
 - D. Decreasing air density means the same indicated airspeed represents a higher true speed

8. A pilot loses the engine-driven vacuum pump. Which instruments will become unreliable, and which will remain?

- A. The attitude and heading indicators fail; the turn coordinator, airspeed, altimeter, VSI, and compass remain
- B. The turn coordinator and airspeed fail; the attitude indicator remains
- C. The altimeter and VSI fail; the attitude indicator remains
- D. All gyroscopic instruments fail simultaneously

9. A pilot flying an ILS captures what appears to be the glide slope at an unusually steep angle well above the published intercept altitude. What is the likely explanation?

- A. The localizer is interfering with the glide slope
- B. The DME is causing harmonic distortion
- C. The marker beacon reflected the signal
- D. A false glide slope lobe exists above the true path

10. A pilot in IMC feels a strong sensation of turning even though the instruments show wings level and a constant heading. What is occurring, and what should the pilot do?

- A. The turn coordinator has failed; disregard it
- B. The aircraft is actually turning; correct toward the sensation
- C. Spatial disorientation (a vestibular illusion); trust the instruments
- D. The heading indicator has precessed; realign it immediately

11. A pilot notices the ammeter showing a discharge and a low-voltage warning in cruise. What is the underlying problem, and the priority action?

- A. The alternator has failed; shed nonessential loads and preserve the battery
- B. The battery is overcharging; reduce engine RPM

- C. The transponder failed; squawk 7600
- D. The static system is blocked; select the alternate source

12. A pilot on a non-precision approach descends to the MDA and levels off. Why must the aircraft not descend below the MDA without the required visual references?

- A. The MDA guarantees obstacle clearance only down to that altitude without visual confirmation
- B. The MDA is merely advisory and may be exceeded
- C. Descending improves glide slope capture
- D. The MDA applies only to precision approaches

13. A pilot observes lowering stratiform clouds, steady rain, and gradually worsening visibility over a wide area. What does this pattern indicate?

- A. An unstable air mass with convective showers
- B. A fast-moving cold front with thunderstorms
- C. A dry line producing scattered showers
- D. Stable air being lifted ahead of an approaching warm front

14. A pilot sees rapidly building cumulus, showery precipitation, and good visibility between showers. What does this indicate about the air mass?

- A. Unstable air producing convective activity and turbulence
- B. Stable air producing layered clouds
- C. A temperature inversion aloft
- D. A warm front passing overhead

15. A pilot encounters freezing rain while climbing in IMC. What does its presence reveal about the atmosphere, and what is the best response?

- A. Colder air lies above; the only option is to descend
- B. The icing is harmless rime; no action is needed
- C. Warmer air lies above; climbing may exit the icing layer
- D. The aircraft is in a thunderstorm; reverse course

16. A pilot's aircraft accumulates rough, milky, opaque ice on the leading edges. What type of ice is this, and what does it indicate?

- A. Clear ice from large supercooled droplets
- B. Rime ice from small supercooled droplets freezing on contact
- C. Frost from sublimation on the ground
- D. Mixed ice from freezing rain only

17. A pilot flying through a region of high pressure in the Northern Hemisphere generally encounters what weather, and why?

- A. Clouds and precipitation, because air rises in a high
- B. Fair weather, because descending air in a high suppresses cloud formation
- C. Thunderstorms, because highs are unstable
- D. Fog only, because highs trap moisture

18. A pilot reaches the decision altitude on an ILS and the runway environment is not in sight. Why must the missed approach be initiated at the DA rather than continuing?

- A. The localizer fails below the DA
- B. ATC requires it regardless of visibility
- C. The glide slope reverses below the DA
- D. Below the DA, obstacle clearance is no longer guaranteed without visual references

19. A pilot's heading indicator reads 15 degrees different from the magnetic compass after an hour of flight. What is the cause, and the correct action?

- A. Gyroscopic precession; realign the heading indicator in straight-and-level flight
- B. A vacuum failure; disregard the heading indicator
- C. Magnetic deviation; adjust the compass card
- D. Electrical interference; turn off the avionics

20. A pilot flying a partial-panel approach after a vacuum failure must recover from an inadvertent nose-low attitude. Why must the wings be leveled before raising the nose?

- A. The attitude indicator requires wings level to function
- B. Pulling while banked tightens the turn and increases load factor, risking overstress
- C. Leveling the wings restores the heading indicator
- D. Raising the nose first reduces airspeed too rapidly

21. A pilot finds that selecting the alternate static source causes the altimeter and airspeed to read slightly high. Why does this occur?

- A. The alternate source increases ram pressure
- B. Cabin static pressure is usually slightly lower than outside static pressure
- C. The pitot tube is bypassed by the alternate source
- D. The VSI feeds erroneous data to the altimeter

22. A pilot loses two-way radio communication in VMC while on an IFR flight plan. Why is the correct action to continue VFR and land as soon as practical?

- A. Remaining in VMC allows safe visual flight and landing without the IMC route rules
- B. The IMC altitude rules require an immediate climb
- C. The aircraft must squawk 7700 and descend

D. ATC will clear the airspace only if the aircraft holds

23. A pilot in IMC experiences a powerful pitch-up sensation just after a rapid acceleration on takeoff. What illusion is this, and why is it dangerous?

A. The leans, producing a false bank that leads to a spiral

B. The somatogravic illusion, where acceleration feels like a climb, tempting a nose-down input toward the ground

C. The Coriolis illusion, from head movement during a turn

D. The graveyard spiral, where descent feels level

24. A pilot tracking a VOR radial finds the CDI needle deflecting opposite to the direction needed to correct. What is occurring, and why?

A. The DME has failed, inverting the CDI

B. Reverse sensing, because the OBS course disagrees with the direction of flight

C. The VOR signal is beyond its service volume

D. The receiver gain has saturated

25. A pilot's aircraft drifts steadily off a course despite an established wind correction angle, with the CDI moving consistently to one side. What does this indicate?

A. The VOR has failed

B. Reverse sensing is occurring

C. The wind correction angle is too large

D. The wind correction angle is insufficient and must be increased

26. A pilot flying a glass cockpit loses the air data computer. Which symptoms result, and why?

A. Airspeed, altitude, and vertical speed displays fail because the ADC processes pitot-static data

- B. The attitude and heading displays fail because the ADC drives them
- C. Only the transponder fails
- D. The autopilot servos disengage but the displays remain

27. A pilot notices the turn coordinator shows a left turn with the ball deflected to the right. What does this symptom indicate?

- A. A coordinated left turn
- B. A failed turn coordinator
- C. A skidding turn requiring more rudder into the turn or less bank
- D. A slipping turn requiring more bank

28. A pilot flying near a mature thunderstorm encounters the most violent conditions. Why is the mature stage the most hazardous?

- A. Only updrafts are present, lifting the aircraft gently
- B. Only downdrafts are present, easing the turbulence
- C. The storm is dissipating and weakening
- D. Strong updrafts and downdrafts coexist, producing severe turbulence, hail, and wind shear

29. A pilot in cruise finds the DME reading 1 NM while directly over a station at 6,000 feet AGL, though the ground distance is essentially zero. Why?

- A. The DME has malfunctioned
- B. DME measures slant range, which equals the altitude overhead
- C. The signal reflected off terrain
- D. The receiver lost lock momentarily

30. A pilot's GPS annunciates a RAIM warning during an approach. What does this indicate, and why does it matter?

- A. The GPS has lost all satellites permanently
- B. Integrity cannot be assured, so the GPS approach may be unusable
- C. The database has expired mid-flight
- D. The WAAS signal has improved accuracy

31. A pilot flying an approach loses the glide slope but retains the localizer. Why does the approach become non-precision?

- A. The localizer fails without the glide slope
- B. The DME compensates for the lost glide slope
- C. Without vertical guidance, only lateral guidance remains, requiring an MDA
- D. The approach becomes a circling-only procedure

32. A pilot must determine why an aft CG makes unusual-attitude recovery harder in IMC. What is the reason?

- A. An aft CG raises the stall speed dramatically
- B. An aft CG reduces longitudinal stability, so disturbances grow more readily
- C. An aft CG increases control forces, making the aircraft sluggish
- D. An aft CG has no effect on recovery

33. A pilot flying a holding pattern at altitude finds the inbound leg consistently too long with a 1.5-minute target above 14,000 feet. Why is the leg timed longer at high altitude?

- A. Higher true airspeeds would otherwise enlarge the pattern beyond protected airspace
- B. The compass is unreliable, requiring more time
- C. ATC requires longer legs for radar
- D. Fuel conservation dictates longer legs

34. A pilot's aircraft enters a graveyard spiral after a vacuum failure went unrecognized. Why does this occur?

- A. The turn coordinator fails in a spiral
- B. The compass leads the aircraft into a turn
- C. A failing attitude indicator presents a false level picture, and the pilot follows it into a descending turn
- D. The altimeter freezes, hiding the descent

35. A pilot reads that the localizer is more sensitive than a VOR. Why does this matter on final approach?

- A. The localizer responds more slowly to deviations
- B. Small deviations cause large needle deflections, requiring smooth, small corrections
- C. The localizer provides vertical guidance
- D. Full-scale deflection represents a larger angle than a VOR

36. A pilot flying single-pilot IFR succumbs to "get-there-itis" and continues into worsening weather. Why is this external pressure so dangerous?

- A. It causes mechanical failures
- B. It is a regulatory violation by itself
- C. It pressures the pilot to continue beyond safe limits, eroding judgment
- D. It only affects student pilots

37. A pilot recovering from a nose-high unusual attitude with a failed attitude indicator recognizes it by which symptoms, and acts how?

- A. Increasing airspeed and altitude; raise the nose
- B. Decreasing airspeed and altitude; reduce power

- C. Decreasing airspeed and increasing altitude; add power, lower the nose, level the wings
- D. Increasing airspeed and decreasing altitude; add power

38. A pilot determines that a destination forecast of a 1,200-foot ceiling requires an alternate. Why does the 1-2-3 rule trigger here?

- A. The visibility is unknown
- B. The destination lacks an approach
- C. An alternate is always required
- D. The ceiling is below the 2,000-foot threshold for the window

39. A pilot recognizes radiation fog forming at dawn. Why do clear, calm conditions with a small temperature-dewpoint spread produce it?

- A. The ground radiates heat, cooling the air to saturation with no wind to mix it
- B. Warm moist air moves over a cool surface
- C. Air is forced up sloping terrain and cools
- D. Cold air moves over warmer water

40. A pilot's aircraft loses electrical power in a glass cockpit in IMC. Why are the backup instruments critical?

- A. They provide weather information
- B. They power the autopilot
- C. The primary electronic displays go dark, and the independent backups preserve attitude, altitude, and airspeed
- D. They improve the moving map resolution

41. A pilot flying a DME arc lets the distance increase beyond the arc value. Why must the pilot turn toward the station to correct?

- A. Turning away widens the arc further
- B. The DME reads ground distance, not slant range
- C. Increasing airspeed would correct it
- D. Turning toward the station reduces the distance back to the arc value

42. A pilot must understand why a procedure turn is not flown when established on a NoPT routing. What is the reason?

- A. The procedure turn is replaced by a DME arc
- B. NoPT applies only to precision approaches
- C. The routing already aligns the aircraft for the approach, making the reversal unnecessary
- D. ATC must approve every procedure turn

43. A pilot finds the compass indicating a turn toward north while accelerating on an easterly heading, though the heading is unchanged. Why?

- A. Acceleration error (ANDS): accelerating on an easterly heading indicates a turn toward north
- B. Turning error from magnetic dip
- C. The compass float has precessed
- D. Electrical interference from acceleration

44. A pilot flying an approach must identify the missed approach point by timing from the FAF. Why is timing used here?

- A. The MAP is defined by the glide slope
- B. No fix, DME, or GPS waypoint defines the MAP, so timing from the FAF at a known groundspeed locates it
- C. The localizer defines the MAP
- D. The middle marker always defines the MAP

45. A pilot loses communication in IMC and flies the highest of the assigned, minimum, or expected altitude for each segment. Why the highest value?

- A. To conserve fuel by climbing high
- B. To improve radio reception
- C. To guarantee terrain and obstacle clearance throughout the route
- D. To match the magnetic-course cruising rule

46. A pilot's aircraft has an inoperative item not required by regulation, the TC, or an AD, and no MEL. Why may the flight proceed after placarding it inoperative?

- A. The item repairs itself in flight
- B. Placarding voids the airworthiness requirement entirely
- C. 14 CFR 91.213 permits deactivating or removing and placarding a nonrequired inoperative item
- D. Only an A&P can authorize it by phone

47. A pilot understands that a SID must be assigned by ATC while an ODP may be flown without assignment. Why the difference?

- A. A SID serves traffic-flow management (ATC's role); an ODP serves obstacle clearance (a pilot responsibility)
- B. ODPs apply only to turbine aircraft
- C. SIDs provide obstacle clearance and ODPs provide traffic flow
- D. ODPs are flown only in VMC

48. A pilot reviewing why the briefing strip is at the top of the approach chart understands its purpose as what?

- A. To list runway dimensions only
- B. To show enroute frequencies

- C. To present the most critical information for efficient briefing before the approach
- D. To display the missed approach coordinates exclusively

49. A pilot flying severe turbulence slows to maneuvering speed. Why does this protect the airframe?

- A. Slowing reduces fuel consumption
- B. V_A is where the autopilot engages turbulence mode
- C. Slowing improves radio reception
- D. At or below V_A , the aircraft stalls before aerodynamic loads exceed structural limits

50. A pilot must report a loss of navigation capability to ATC even in radar contact. Why?

- A. Radar cannot detect the aircraft without navigation gear
- B. So ATC can provide vectors and adjust separation and handling
- C. The report is optional in radar contact
- D. It is required only outside radar contact

51. A pilot computes the time to fly a 40 NM leg at a groundspeed of 240 knots. What is the time?

- A. 10 minutes
- B. 20 minutes
- C. 25 minutes
- D. 15 minutes

52. A pilot computes the descent rate to lose 3,000 feet over 9 NM at a groundspeed of 180 knots (3 NM/min). What rate is required?

- A. 1,000 feet per minute
- B. 800 feet per minute

- C. 600 feet per minute
- D. 500 feet per minute

53. A pilot must determine the magnetic bearing TO an NDB with a magnetic heading of 200° and a relative bearing of 110° . What is the bearing to the station?

- A. 110 degrees
- B. 200 degrees
- C. 090 degrees
- D. 310 degrees

54. A pilot computes the climb rate for a departure requiring 250 ft/NM at a groundspeed of 120 knots (2 NM/min). What rate is required?

- A. 250 feet per minute
- B. 500 feet per minute
- C. 400 feet per minute
- D. 600 feet per minute

55. A pilot computes the wind correction angle with a 12-knot crosswind component and a true airspeed of 120 knots, using $WCA \approx \text{crosswind} \div (\text{TAS} \div 60)$. What is the WCA?

- A. 12 degrees
- B. 6 degrees
- C. 10 degrees
- D. 4 degrees

56. A pilot computes the time from the FAF to the MAP. The distance is 5 NM and the groundspeed is 150 knots (2.5 NM/min). What is the time?

- A. 3 minutes
- B. 2.5 minutes
- C. 2 minutes
- D. 4 minutes

57. A pilot computes the descent gradient to lose 6,000 feet over 30 NM. What gradient is required?

- A. 200 feet per NM
- B. 250 feet per NM
- C. 150 feet per NM
- D. 300 feet per NM

58. A pilot flying a standard-rate turn needs to reverse course 180 degrees. How long does the turn take at 3 degrees per second?

- A. 30 seconds
- B. 60 seconds
- C. 90 seconds
- D. 45 seconds

59. A pilot computes groundspeed with a true airspeed of 150 knots and a 30-knot tailwind, then the time for a 72 NM leg. What is the groundspeed and time?

- A. 120 knots, 30 minutes
- B. 150 knots, 24 minutes
- C. 180 knots, 20 minutes
- D. 180 knots, 24 minutes

60. A pilot must compute total fuel for an IFR flight: 2.0 hours to destination, 0.75 hours to alternate, plus the required reserve, at 10 gallons per hour. What minimum fuel is needed?

- A. 35.0 gallons
- B. 27.5 gallons
- C. 30.0 gallons
- D. 41.4 gallons

+ Answer Key

1. D — A blocked pitot tube with an open drain lets trapped ram pressure bleed out, so the airspeed drops toward zero while the static-driven altimeter and VSI keep working. The airspeed indicator is the only instrument using pitot pressure, so only it is affected.

2. A — A blocked static port affects all three pitot-static instruments at once: the altimeter freezes, the VSI reads zero, and the airspeed becomes inaccurate. Only a static blockage explains all three symptoms together.

3. D — When the attitude indicator shows a climbing turn but the turn coordinator, altimeter, and airspeed all confirm level flight, and the vacuum gauge is low, the vacuum-driven attitude indicator has failed. The instrument that disagrees with the independent group is the failed one.

4. D — Cold, dense air lowers the true height for a given indicated altitude, and the altimeter cannot sense temperature, so true altitude is lower than indicated. This is the cold-air corollary of "high to low, look out below."

5. C — When both the pitot tube and its drain are blocked, trapped pressure is compared against changing static pressure, so the airspeed indicator behaves like an altimeter—rising in the climb, falling in the descent. This is the classic dual-blockage signature, usually from ice.

6. D — Magnetic dip pulls the compass card downward, producing turning error that makes the compass lag on a turn to north. This error is most pronounced near north and south (the basis of UNOS).

7. D — Decreasing air density with altitude means the same indicated airspeed represents a higher true airspeed. The airspeed indicator senses dynamic pressure, which understates true speed as density falls.

8. A — A vacuum failure disables the vacuum-driven attitude and heading indicators while the electric turn coordinator, plus the airspeed indicator, altimeter, VSI, and compass, remain. This deliberate split in power sources is the basis of partial-panel flying.

9. D — A glide slope captured at a steep angle well above the published intercept altitude is a false glide slope lobe, which exists above the true path. Intercepting from below at the published altitude avoids capturing it.

10. C — A strong turning sensation while the instruments show level flight is spatial disorientation—a vestibular illusion—and the pilot must trust the instruments. Acting on the false sensation rather than the instruments leads to loss of control.

11. A — A discharging ammeter and low-voltage warning indicate the alternator has failed, leaving the aircraft on battery power; the priority is to shed nonessential loads and preserve the battery. The battery has finite reserve, so essential equipment must be protected.

12. A — The MDA guarantees obstacle clearance only down to that altitude without visual confirmation of the runway, so descent below it requires the required visual references in sight. Going lower blind would forfeit the obstacle protection.

13. D — Lowering stratiform clouds, steady rain, and gradually worsening visibility over a wide area indicate stable air being lifted ahead of an approaching warm front. The layered clouds and steady (not showery) precipitation are signatures of stable air.

14. A — Rapidly building cumulus, showery precipitation, and good visibility between showers indicate unstable air producing convective activity and turbulence. Cumuliform development and showers are the hallmarks of instability.

15. C — Freezing rain indicates a layer of warmer air aloft where the precipitation formed as liquid, so climbing may exit the icing layer. It produces dangerous clear ice rapidly, making prompt escape essential.

16. B — Rough, milky, opaque ice on the leading edges is rime ice, formed when small supercooled droplets freeze on contact. Clear ice, by contrast, is smooth and transparent, from larger droplets flowing back before freezing.

17. B — A high-pressure system has descending air that suppresses cloud formation, producing generally fair weather and good visibility. A low, by contrast, has rising air that forms clouds and precipitation.

18. D — Below the decision altitude, obstacle clearance is no longer guaranteed without the required visual references, so the missed approach must be initiated at the DA. The DA is the engineered floor of the protected vertical path.

19. A — A heading indicator reading 15 degrees off the compass after an hour is gyroscopic precession, corrected by realigning the heading indicator in straight-and-level, unaccelerated flight. The compass is reliable only in that condition, so it is the reference for realignment.

20. B — Pulling the nose up while still banked tightens the turn and increases load factor, risking structural overstress, so the wings are leveled first. Leveling the lift vector before recovering pitch keeps loads within limits.

21. B — Cabin static pressure is usually slightly lower than outside static pressure, so the alternate static source causes the altimeter and airspeed to read slightly high. Pilots apply the AFM corrections to account for this.

22. A — Remaining in VMC allows safe visual flight and landing without invoking the IMC route-and-altitude rules, so the pilot continues VFR and lands as soon as practical. The full 91.185 rules apply only if the flight is in IMC.

23. B — A pitch-up sensation after rapid acceleration is the somatogravic illusion, where forward acceleration feels like a climb, tempting a dangerous nose-down input toward the ground. With no horizon on a dark or IMC takeoff, the pilot may fly into terrain.

24. B — A CDI deflecting opposite to the required correction is reverse sensing, occurring when the selected OBS course disagrees with the direction of flight. Setting the OBS to the course flown, or using an HSI, eliminates it.

25. D — A steady drift off course with the CDI moving consistently to one side despite an established crab means the wind correction angle is insufficient and must be increased. A too-large correction would overshoot and drift the other way.

26. A — The air data computer processes pitot-static data, so its loss causes the airspeed, altitude, and vertical speed displays to fail. The AHRS, by contrast, handles attitude and heading.

27. C — A left turn with the ball deflected right is a skidding turn, requiring more rudder into the turn or less bank to coordinate. The ball toward the outside of the turn is the signature of a skid.

28. D — The mature stage features coexisting strong updrafts and downdrafts and is the most violent, with severe turbulence, hail, and wind shear. The cumulus stage has updrafts only; the dissipating stage is dominated by downdrafts.

29. B — DME measures slant range, which directly overhead equals the aircraft's altitude even though the ground distance is essentially zero. At 6,000 feet AGL (about 1 NM) overhead, the DME reads about 1 NM.

30. B — A RAIM warning indicates integrity cannot be assured, so the GPS approach may be unusable. RAIM uses redundant satellites to verify the position, and without that assurance the approach cannot be relied upon.

31. C — Without the glide slope, only lateral guidance remains, so the approach is non-precision and flown to an MDA. The localizer continues to provide course guidance even without vertical guidance.

32. B — An aft CG reduces longitudinal stability, so disturbances grow more readily, making unusual-attitude recovery harder—especially in IMC. Reduced stability means the aircraft is less self-correcting.

33. A — Higher true airspeeds at altitude would enlarge the holding pattern beyond protected airspace, so the inbound leg is lengthened to 1.5 minutes above 14,000 feet. The longer leg compensates for the greater distance covered.

34. C — A failing attitude indicator presents a false level picture, and the pilot, trusting it, follows it into a descending turn—the graveyard spiral. Recognizing the failure by cross-check is the defense.

35. B — Because the localizer is more sensitive than a VOR, small deviations cause large needle deflections, requiring smooth, small corrections on final. Over-controlling a sensitive localizer causes oscillation near the runway.

36. C — "Get-there-itis" pressures the pilot to continue beyond safe limits to reach a goal, eroding judgment. This external pressure has caused many accidents, countered by honoring preset personal minimums.

37. C — A nose-high unusual attitude is recognized by decreasing airspeed and increasing altitude, and recovered by adding power, lowering the nose, and leveling the wings. Addressing the impending stall first is the priority.

38. D — The 1-2-3 rule triggers an alternate because the 1,200-foot ceiling is below the 2,000-foot threshold for the required window. Both a 2,000-foot ceiling and 3-mile visibility must be met to skip the alternate.

39. A — Under clear, calm conditions with a small temperature-dewpoint spread, the ground radiates heat and cools the air to saturation with no wind to mix it, forming radiation fog. These are the classic dawn conditions.

40. C — In a total electrical failure, the primary electronic displays go dark, and the independent backup instruments preserve attitude, altitude, and airspeed. These standby instruments keep the aircraft controllable.

41. D — When the DME distance increases beyond the arc value, turning toward the station reduces the distance back to the arc. Turning away would widen the arc further.

42. C — On a NoPT routing, the procedure turn is not flown because the routing already aligns the aircraft for the approach, making the course reversal unnecessary. Flying one anyway could conflict with ATC's plan.

43. A — Accelerating on an easterly heading produces acceleration error (ANDS: Accelerate North), making the compass indicate a turn toward north though the heading is unchanged. This error is worst on east/west headings.

44. B — When no fix, DME, or GPS waypoint defines the MAP, timing from the FAF at a known groundspeed locates it using the chart's time-distance table. Reaching the computed time without the runway requires a missed approach.

45. C — Flying the highest of the assigned, minimum, or expected altitude guarantees terrain and obstacle clearance throughout the route when no current clearance exists. The highest applicable value protects the aircraft on every segment.

46. C — Under 14 CFR 91.213, a nonrequired inoperative item may be deactivated or removed and placarded inoperative, allowing the flight to proceed without an MEL. The process confirms the item is not required before deferral.

47. A — A SID serves traffic-flow management—ATC's role—so it is always assigned, while an ODP serves obstacle clearance, a pilot responsibility, so it may be flown without assignment. Their differing purposes drive the difference.

48. C — The briefing strip is placed at the top of the chart to present the most critical information for efficient briefing before the approach. This standardized layout lets the pilot prepare quickly.

49. D — At or below maneuvering speed (V_A), the aircraft stalls before aerodynamic loads exceed structural limits, protecting the airframe in severe turbulence. Flying faster risks a gust imposing loads beyond the structure's capacity.

50. B — A loss of navigation capability must be reported at all times so ATC can provide vectors and adjust separation and handling. ATC cannot assist with a problem it does not know about.

51. A — At 240 knots groundspeed, 40 NM takes $40 \div 240 \times 60 = 10$ minutes. Time over the ground is distance divided by groundspeed.

52. A — The descent is 3,000 feet over 9 NM; at 3 NM/min the 9 NM takes 3 minutes, so $3,000 \div 3 = 1,000$ feet per minute. Matching descent rate to distance and groundspeed achieves the loss.

53. D — Magnetic bearing TO the station = magnetic heading + relative bearing = $200^\circ + 110^\circ = 310^\circ$. The ADF relative bearing is added to heading to obtain the magnetic bearing to the station.

54. B — At 120 knots (2 NM/min), a 250 ft/NM gradient requires $250 \times 2 = 500$ feet per minute. The gradient is multiplied by groundspeed in nautical miles per minute.

55. B — $WCA \approx \text{crosswind} \div (\text{TAS} \div 60) = 12 \div (120 \div 60) = 12 \div 2 = 6$ degrees. The rule estimates the crab angle needed against the crosswind component.

56. C — At 150 knots (2.5 NM/min), 5 NM takes $5 \div 2.5 = 2$ minutes to the MAP. Timing from the FAF identifies the MAP when no fix or waypoint defines it.

57. A — The gradient is 6,000 feet over 30 NM = $6,000 \div 30 = 200$ feet per NM. Descent gradient equals altitude loss divided by distance.

58. B — A 180° reversal at standard rate ($3^\circ/\text{sec}$) takes $180 \div 3 = 60$ seconds. Timed turns substitute for the failed heading indicator.

59. D — Groundspeed = $150 + 30 = 180$ knots; 72 NM at 180 knots takes $72 \div 180 \times 60 = 24$ minutes. The tailwind adds to true airspeed to yield groundspeed.

60. A — Fuel = $2.0 \text{ hr} + 0.75 \text{ hr} + 0.75 \text{ hr reserve} = 3.5 \text{ hr} \times 10 \text{ gph} = 35.0$ gallons. The 45-minute IFR reserve (0.75 hr) is added after destination and alternate before applying the burn rate.