PRACTICE EXAM 25 (60 QUESTIONS)

1. A pilot at a towered airport calls clearance delivery and copies: "Cleared to KXYZ as filed, climb and maintain 3,000, expect 8,000 one-zero minutes after departure, departure frequency 124.5, squawk 4271." Which element was NOT part of "as filed" and was stated separately?

A. The destination airport

B. The departure frequency only

C. The transponder code only

D. The altitude (climb-and-maintain and expected)

2. A pilot departs a non-towered airport with a clearance void time of 1730Z and a release. After an engine issue, the pilot is not airborne by 1730Z. What is the correct action?

A. Depart within 30 minutes anyway, since the void time auto-extends

B. Depart VFR into the overcast and pick up the clearance airborne

C. Notify ATC as soon as possible, because the clearance is void

D. Hold on the ground and depart whenever ready

3. A pilot crossing a holding fix arrives from a direction that places the aircraft on the holding side of the inbound course. Which entry should be flown?

A. Direct entry

B. Teardrop entry

C. Parallel entry

D. No entry; proceed straight through the fix

4. A pilot is cleared for an ILS approach with "maintain 2,500 until established, cleared ILS runway 9." The aircraft is at 2,500 feet approaching the localizer. When may the pilot descend on the glide slope?

A. Immediately upon receiving the clearance

B. After crossing the final approach fix regardless of glide slope

C. At the pilot's discretion before intercepting the localizer

D. Once established on the localizer and intercepting the glide slope

5. A pilot flying an ODP from a terrain-surrounded airport must climb to a specified altitude before turning on course. Why?

A. To establish radio contact with departure control

B. To allow the landing gear to fully retract

C. To comply with noise abatement

D. To ensure obstacle clearance before turning toward the route

6. A pilot loses the vacuum pump in cruise IMC and ATC assigns a turn to a new heading. How should the pilot execute the turn?

A. Use a timed turn at standard rate on the turn coordinator

B. Use the failed attitude indicator cautiously

C. Refuse the turn and request to maintain heading

D. Use the magnetic compass throughout the turn

7. A pilot computes the time to fly a 36 NM leg at a groundspeed of 144 knots. What is the time?

A. 15 minutes

B. 20 minutes

C. 25 minutes

D. 30 minutes

8. A pilot on a non-precision approach reaches the MDA with the runway not yet in sight and continues toward the missed approach point. The runway never comes into view at the MAP. What must the pilot do?

A. Descend below the MDA briefly to search for the runway

B. Execute the published missed approach

C. Circle at the MDA until the runway appears

D. Continue past the MAP for 30 seconds

9. A pilot receives "descend via the CRWND arrival." A fix is charted "cross at or above 7,000, 250 KT." How should the pilot comply?

A. Maintain the last assigned altitude and ignore the restriction

B. Descend immediately to 7,000 regardless of position

C. Descend at pilot's discretion to cross at or above 7,000 while meeting the speed

D. Cross at exactly 7,000 and disregard the speed

10. A pilot notices the attitude indicator slowly tilting while the turn coordinator, altimeter, VSI, and compass confirm level flight, and the vacuum gauge reads low. What is the correct action?

A. Bank to correct the attitude indicator's indication

B. Disregard the attitude indicator and fly partial panel on the supporting instruments

C. Realign the heading indicator to stop the tilt

D. Declare an emergency and descend immediately

11. A pilot copies an IFR clearance using CRAFT. After "Clearance limit" and "Route," what does the "A" represent?

A. The aircraft type

B. The altitude assignment

C. The alternate airport

D. The approach to expect

12. A pilot reaches the decision altitude on an ILS in fog with no runway environment in sight. What is required?

A. Execute the missed approach at the DA

B. Level off and continue to a separate missed approach point

C. Descend 50 feet to look for the runway

D. Circle at the DA until the runway is seen

13. A pilot computes the descent rate to lose 4,000 feet over 8 NM at a groundspeed of 120 knots (2 NM/min). What rate is required?

A. 800 feet per minute

B. 1,000 feet per minute

C. 600 feet per minute

D. 500 feet per minute

14. A pilot flying a DME arc notices the distance increasing beyond the arc value. What correction maintains the arc?

A. Turn away from the station to widen the arc

B. Increase airspeed to close the gap

C. Turn slightly toward the station

D. Descend to correct for slant range

15. A pilot on a STAR receives no "descend via" instruction after being cleared for the arrival. What altitude should be maintained?

A. The last assigned altitude until ATC issues further descent

B. The lowest charted crossing altitude

C. The minimum enroute altitude

D. Pilot's discretion to the approach transition

16. A pilot's pitot tube and drain both become blocked by ice during a climb. What does the airspeed indicator show?

A. A decrease toward zero

B. An increase as the aircraft climbs

C. The correct airspeed throughout

D. A frozen, unchanging value

17. A pilot must select the holding entry. Crossing the fix from the side opposite the holding side, the aircraft flies an outbound offset before turning inbound. Which entry is this?

A. Direct entry

B. Parallel entry

C. Teardrop entry

D. A non-standard entry

18. A pilot at a non-towered airport receives "hold for release." What does this mean?

A. The pilot must not depart until ATC issues a release

B. The pilot may depart and contact ATC airborne

C. The clearance is void and must be refiled

D. The pilot should hold over the field after departure

19. A pilot computes the time from the FAF to the MAP. The distance is 4 NM and the groundspeed is 120 knots (2 NM/min). What is the time?

A. 1 minute

B. 3 minutes

C. 4 minutes

D. 2 minutes

20. A pilot flying partial panel after a vacuum failure must change heading by 60 degrees. Using a timed turn at standard rate, how long should the turn be held?

A. 10 seconds

B. 20 seconds

C. 30 seconds

D. 60 seconds

21. A pilot encounters moderate icing in a non-FIKI aircraft at 7,000 feet, with the freezing level at 5,000 feet and cloud tops at 9,000 feet with clear air above. What is the best action?

A. Climb to 10,000 feet to exit the moisture into clear air above

B. Descend to 4,000 feet, accepting continued flight in cloud below the freezing level

C. Maintain altitude and increase speed to shed the ice

D. Continue at 7,000 feet since rime ice is harmless

22. A pilot loses two-way communication in IMC after being assigned "maintain 6,000." On a segment with an MEA of 8,000, what altitude should be flown?

A. 6,000 feet, the assigned altitude only

B. 4,000 feet to stay below the clouds

C. 7,000 feet, an intermediate value

D. 8,000 feet, the highest of assigned, MEA, and expected

23. A pilot flying an approach loses the glide slope at the FAF due to a NOTAM. The localizer remains. What approach now applies?

A. The full ILS to Category I DA

B. The localizer (LOC) approach to the localizer MDA

C. An LPV approach

D. No approach is possible

24. A pilot computes the wind correction angle with a 20-knot crosswind component and a true airspeed of 120 knots, using WCA ≈ crosswind ÷ (TAS ÷ 60). What is the WCA?

A. 5 degrees

B. 15 degrees

C. 20 degrees

D. 10 degrees

25. A pilot at the DA on an ILS sees only the approach lights in heavy rain. Under 91.175, what may the pilot do?

A. Descend to 100 feet above TDZE, and below only with the red terminating or side row bars in sight

B. Land immediately using the approach lights alone

C. Execute a missed approach because lights never permit continuing

D. Circle to another runway

26. A pilot flying an IFR cross-country must cross a fix where the MEA rises from 6,000 to 9,000, with no MCA published. When may the climb begin?

A. Only after crossing the fix

B. Before the fix as needed, to cross at or above the higher MEA

C. Only with a separate climb clearance for each 1,000 feet

D. Only when receiving radar vectors

27. A pilot on an ILS approach intercepts the glide slope at the published intercept altitude from below. Why is intercepting from below preferred?

A. False glide slope signals exist above the true path; intercepting from below avoids them

B. It provides a steeper, faster descent

C. It eliminates the need for the localizer

D. The glide slope is only usable above the intercept altitude

28. A pilot experiences an alternator failure at night in IMC with a 25-minute battery, 40 minutes from the destination. What is the best decision?

A. Divert to a suitable airport within battery endurance and shed nonessential loads

B. Continue to the destination to complete the flight plan

C. Turn off all equipment to save the battery

D. Climb to extend gliding range

29. A pilot copies a clearance with an "Expect Further Clearance" time while holding. What is the significance of the EFC time?

A. It is the latest time the pilot may enter the hold

B. It is the time the fuel reserve expires

C. It is the time the pilot may expect release from the hold, critical for lost communication

D. It is the time the transponder code changes

30. A pilot flying single-pilot IFR feels pressure to descend below minimums to make an appointment, with fuel to divert. What reflects sound decision-making?

A. Execute the missed approach and divert, honoring personal minimums

B. Descend slightly below the MDA to look for the runway

C. Continue past the MAP hoping for improvement

D. Request that ATC lower the minimums

31. A pilot must determine the magnetic bearing TO an NDB with a magnetic heading of 080° and a relative bearing of 030°. What is the bearing to the station?

A. 110 degrees

B. 080 degrees

C. 030 degrees

D. 050 degrees

32. A pilot flying a holding pattern with a tailwind on the outbound leg finds the inbound leg too long. What adjustment is appropriate?

A. Increase the outbound leg time

B. Reverse the turn direction

C. Shorten the outbound leg to bring the inbound leg to the standard time

D. Maintain the same timing, as wind cannot be corrected

33. A pilot computes the climb rate for a departure requiring 300 ft/NM at a groundspeed of 120 knots (2 NM/min). What rate is required?

A. 300 feet per minute

B. 450 feet per minute

C. 500 feet per minute

D. 600 feet per minute

34. A pilot encounters a building cumulonimbus depicted 18 NM ahead on datalink NEXRAD. What is the safest action?

A. Deviate exactly 5 NM, trusting the displayed position

B. Deviate to maintain at least 20 NM, recognizing NEXRAD latency

C. Continue course since 18 NM is safe

D. Fly through, as the cell appears weak

35. A pilot recovering from a nose-low unusual attitude on partial panel must avoid overstressing the airframe. What is the correct sequence?

A. Raise the nose, reduce power, level the wings

B. Reduce power, level the wings with the turn coordinator, then smoothly raise the nose

C. Add power, raise the nose, level the wings

D. Level the wings with the attitude indicator, add power

36. A pilot's destination forecast at ETA is a 1,500-foot ceiling and 4 SM visibility. The destination has an ILS. Is an alternate required under the 1-2-3 rule?

A. No, because visibility exceeds 3 SM

B. No, because the ILS lowers the requirement

C. Yes, because the ceiling is below 2,000 feet

D. Yes, but only without a precision approach

37. A pilot flying a back-course localizer with only a conventional CDI must remember what?

A. The needle indications are reversed; correct by flying away from the needle

B. The glide slope must be followed in reverse

C. The DME counts upward on the back course

D. The frequency must be re-tuned

38. A pilot computes total fuel for an IFR flight: 1.5 hours to destination, 0.5 hours to alternate, plus the required reserve, at 12 gallons per hour. What minimum fuel is needed?

A. 21.0 gallons

B. 28.5 gallons

C. 31.0 gallons

D. 33.0 gallons

39. A pilot flying an ILS notices the localizer needle is very sensitive near the runway, requiring small corrections. Why is the localizer more sensitive than a VOR?

A. The localizer transmits on a lower frequency

B. The localizer includes a glide slope

C. The localizer uses a rotating antenna

D. The localizer course is tailored to a narrow width, giving full deflection over a few degrees

40. A pilot encounters the somatogravic illusion on a dark IMC takeoff during acceleration. What is the correct response?

A. Push the nose down to counter the climb sensation

B. Reduce power to stop the perceived climb

C. Trust the attitude indicator and maintain the indicated climb attitude

D. Bank to relieve the sensation

41. A pilot at FL230 must set which altimeter setting?

A. The nearest station's local setting

B. 29.92 inches Hg, the standard setting

C. The destination forecast setting

D. 30.00 inches Hg

42. A pilot flying a non-precision VOR approach with a stepdown fix must not descend to the MDA until what?

A. Crossing the final approach fix

B. Reaching the visual descent point

C. Receiving a landing clearance

D. Passing the stepdown fix

43. A pilot must report which event to ATC at all times, even in radar contact?

A. A missed approach

B. Crossing each named intersection

C. A two-minute revised estimate

D. Reaching a VFR-on-top altitude

44. A pilot computes the descent point to cross a fix, needing to lose 5,000 feet at 1,000 fpm with a groundspeed of 150 knots (2.5 NM/min). How far before the fix must descent begin?

A. 5 NM

B. 10 NM

C. 12.5 NM

D. 20 NM

45. A pilot at a Class C airport under IFR must have which equipment operative?

A. An ADF and DME

B. A radar altimeter

C. A transponder with altitude reporting (Mode C)

D. A flight director

46. A pilot determines that the destination forecast is exactly a 2,000-foot ceiling and 3 SM visibility through the ETA window. Is an alternate required?

A. No, the forecast meets the 2,000-and-3 condition

B. Yes, the values must exceed the thresholds

C. Yes, an alternate is always required

D. No, only if a precision approach exists

47. A pilot flying an autopilot coupled to a localizer sees "LOC armed" but no capture as the aircraft crosses the course. What should the pilot do?

A. Wait indefinitely, as capture will occur

B. Assume the autopilot failed and shut it off entirely

C. Monitor and be ready to hand-fly or re-arm the mode

D. Increase speed to force capture

48. A pilot reviewing required reports must report a loss of navigation capability under what condition?

A. Only when not in radar contact

B. At all times, even in radar contact

C. Only above 18,000 feet

D. Only on the final approach segment

49. A pilot computes groundspeed with a true airspeed of 130 knots and a 30-knot direct headwind. What is the groundspeed, and what is the time for a 50 NM leg?

A. 160 knots, 18.75 minutes

B. 130 knots, 23 minutes

C. 100 knots, 30 minutes

D. 100 knots, 25 minutes

50. A pilot's instrument currency lapsed seven calendar months ago without regaining it in the grace period. What is required to act as PIC under IFR?

A. Six approaches with a safety pilot in VMC

B. A flight review only

C. A new written knowledge test

D. An instrument proficiency check

51. A pilot must roll out on a northerly heading using only the magnetic compass after a turn. How should the pilot account for compass behavior?

A. Roll out after passing north, since the compass leads

B. Roll out exactly on the indicated heading

C. Use timed turns only and ignore the compass

D. Roll out before reaching north, since the compass lags (undershoot north)

52. A pilot reviewing winds aloft sees the group "9900" for a level. What does this indicate?

A. Light and variable wind

B. Wind from 099° at 00 knots

C. Wind exceeding 100 knots

D. Data unavailable

53. A pilot flying severe turbulence near a thunderstorm should adjust airspeed how?

A. Increase to cruise to exit quickly

B. Maintain current speed regardless

C. Slow to just above stall

D. Slow to or below maneuvering speed so the aircraft stalls before structural limits are exceeded

54. A pilot reviewing an approach must descend below the DA to land. What combination satisfies 14 CFR 91.175?

A. A tower landing clearance alone

B. Familiarity with the airport

C. WAAS equipment aboard

D. In a position to land, required flight visibility, and a required visual reference in sight

55. A pilot computes the descent gradient to lose 4,000 feet over 16 NM. What gradient is required?

A. 200 feet per NM

B. 300 feet per NM

C. 250 feet per NM

D. 150 feet per NM

56. A pilot encounters radiation fog forming at dawn. Which conditions favored its formation?

A. Strong winds and a frontal passage

B. Clear skies, calm wind, and a small temperature-dewpoint spread

C. Warm moist air over a cool surface

D. Cold air over warmer water

57. A pilot reviewing the missed approach on an ILS must begin it where?

A. At the final approach fix

B. At the visual descent point

C. At a separate point beyond the runway

D. At the decision altitude if the runway environment is not in sight

58. A pilot at a non-towered airport copies a clearance with a void time and a release time. Why must the release time be observed?

A. It is the time the transponder code activates

B. It is the time the fuel reserve begins

C. It is the latest time to file the flight plan

D. The aircraft may not depart IFR before the release time

59. A pilot flying single-pilot IFR engages the autopilot during a busy approach. What remains the pilot's responsibility?

A. To rely fully on the automation without monitoring

B. To disengage all automation on final

C. To monitor the flight mode annunciations and verify the automation is doing what is intended

D. To avoid programming the FMS in terminal airspace

60. A pilot copying an IFR clearance hears "hold for release, expect departure clearance time 1845, clearance void if not off by 1900." What does the void time mean?

A. The pilot may depart any time before 1845

B. The pilot must depart before 1900 or the clearance is no longer valid

C. The release time and void time are identical

D. The pilot may depart after 1900 without further coordination

+ Answer Key

1. D — "Cleared as filed" means the route matches the filing, but the altitude (the climb-and-maintain and the expected altitude) is always stated separately because the filed altitude is a request. The pilot reads back the assigned and expected altitudes to confirm.

2. C — If not airborne by the void time, the pilot must notify ATC as soon as possible, because the clearance is void and the airspace may be reassigned. Departing after the void time without a new clearance is illegal and unsafe.

3. C — Arriving on the holding side of the inbound course calls for a parallel entry: parallel the inbound course outbound, then turn back to intercept. This keeps the aircraft within protected airspace given the arrival geometry.

4. D — With "maintain 2,500 until established, cleared ILS," the pilot descends on the glide slope once established on the localizer and intercepting the glide slope. Descending before being established would forfeit course and obstacle protection.

5. D — A climb-before-turning restriction in an ODP ensures obstacle clearance before the aircraft turns toward the route. ODPs are built around terrain and obstacles, so the initial straight climb protects the turn.

6. A — With the vacuum-driven attitude and heading indicators failed, the assigned turn is flown as a timed turn at standard rate on the electric turn coordinator. The compass is unreliable during the turn, so timing provides the accurate reference.

7. A — At 144 knots groundspeed, 36 NM takes 36 ÷ 144 × 60 = 15 minutes. Time over the ground is distance divided by groundspeed.

8. B — Reaching the missed approach point without the runway in sight requires executing the published missed approach. Descending below the MDA or continuing past the MAP is a leading cause of controlled-flight-into-terrain accidents.

9. C — A "descend via" clearance authorizes descent at pilot's discretion to cross the fix at or above 7,000 while meeting the 250-knot speed. The charted crossing and speed restrictions are binding under the clearance.

10. B — A slowly tilting attitude indicator contradicted by the turn coordinator, altimeter, VSI, and compass, with a low vacuum gauge, indicates a failing vacuum-driven attitude indicator; the pilot disregards it and flies partial panel. Following the failing instrument would lead toward a spiral.

11. B — In the CRAFT mnemonic, "A" is the altitude assignment, following Clearance limit and Route. The full sequence is Clearance limit, Route, Altitude, Frequency, Transponder.

12. A — Reaching the decision altitude on an ILS without the runway environment in sight requires executing the missed approach at the DA. The decision is made at the altitude, with a slight descent during the go-around expected.

13. B — The descent is 4,000 feet over 8 NM; at 2 NM/min the 8 NM takes 4 minutes, so 4,000 ÷ 4 = 1,000 feet per minute. Matching descent rate to distance and groundspeed achieves the loss.

14. C — When the DME distance increases beyond the arc value, the pilot turns slightly toward the station to re-establish the arc. Small corrections toward or away from the station maintain the constant distance.

15. A — Without a "descend via" clearance, the pilot maintains the last assigned altitude until ATC issues further descent. The charted crossing restrictions apply only when descent via the STAR is authorized.

16. B — With both the pitot tube and drain blocked, trapped pressure is compared against falling static pressure, so the airspeed indicator reads increasing as the aircraft climbs. This is the classic dual-blockage behavior, mimicking an altimeter.

17. C — Arriving from the side opposite the holding side, flying an outbound offset before turning inbound, is a teardrop entry. The teardrop geometry keeps the aircraft within protected airspace for that arrival direction.

18. A — "Hold for release" means the pilot must not depart until ATC issues a release. It is used at non-towered airports to manage IFR departures into the system.

19. D — At 120 knots (2 NM/min), 4 NM takes 4 ÷ 2 = 2 minutes to the MAP. Timing from the FAF identifies the MAP when no fix or waypoint defines it.

20. B — A 60° heading change at standard rate (3°/sec) takes 60 ÷ 3 = 20 seconds. Timed turns substitute for the failed heading indicator.

21. A — With cloud tops at 9,000 feet and clear air above, climbing to 10,000 feet exits the visible moisture, stopping ice accumulation in a non-FIKI aircraft. Removing the moisture is the escape; descending to 4,000 feet (option B) would keep the aircraft in cloud near the freezing level where icing continues, and increasing speed or continuing offer no protection.

22. D — Under 91.185 the lost-comm altitude is the highest of the assigned (6,000), MEA (8,000), and any expected altitude, so 8,000 is flown on this segment. Selecting the highest applicable value guarantees obstacle clearance.

23. B — With the glide slope NOTAMed out and the localizer remaining, a localizer (LOC) approach is flown to the localizer MDA. Losing vertical guidance downgrades the ILS to a non-precision approach.

24. D — WCA ≈ crosswind ÷ (TAS ÷ 60) = 20 ÷ (120 ÷ 60) = 20 ÷ 2 = 10 degrees. The rule estimates the crab angle needed against the crosswind component.

25. A — Under 91.175, with only the approach lights in sight at the DA, the pilot may descend to 100 feet above TDZE, and below that only if the red terminating or side row bars are visible. This is the specific approach-light exception to the visual-reference rule.

26. B — With no MCA published, the pilot may begin the climb before the fix as needed to cross it at or above the higher MEA. Starting early ensures the higher minimum is met while maintaining obstacle clearance.

27. A — False glide slope signals exist above the true path, so intercepting from below at the published altitude avoids capturing a false upper lobe. A "dive and drive" from above risks following an erroneous higher-angle signal.

28. A — With a 25-minute battery and the destination 40 minutes away, the pilot diverts to a suitable airport within battery endurance and sheds nonessential loads. Continuing to the destination would exhaust the battery before landing.

29. C — The EFC time is the time the pilot may expect release from the hold, and it is critical if communication is lost while holding, governing when to leave the fix. It lets ATC predict the lost-comm aircraft's behavior.

30. A — Sound decision-making is to execute the missed approach and divert, honoring personal minimums, since fuel is adequate. Descending below minimums, continuing past the MAP, or asking ATC to lower minimums are unsafe or impossible.

31. A — Magnetic bearing TO the station = magnetic heading + relative bearing = 080° + 030° = 110°. The ADF relative bearing is added to heading to obtain the magnetic bearing to the station.

32. C — A tailwind outbound lengthened the inbound leg, so the pilot shortens the outbound leg to bring the inbound leg back to the standard time. The outbound timing is adjusted to compensate for wind.

33. D — At 120 knots (2 NM/min), a 300 ft/NM gradient requires 300 × 2 = 600 feet per minute. The gradient is multiplied by groundspeed in nautical miles per minute.

34. B — The pilot should deviate to maintain at least 20 NM, because NEXRAD imagery is delayed and hazards extend beyond the visible cell. A 5-NM deviation based on a latent image is unsafe.

35. B — For a nose-low recovery on partial panel, reduce power, level the wings with the turn coordinator, then smoothly raise the nose. Leveling the wings before raising the nose prevents tightening the spiral and overstressing the airframe, and the turn coordinator is used because the attitude indicator may be failed.

36. C — The destination ceiling of 1,500 feet is below 2,000 feet, so an alternate is required under the 1-2-3 rule, even though visibility exceeds 3 SM. Both the 2,000-foot ceiling and 3-mile visibility must be met to skip the alternate.

37. A — On a back-course localizer with only a conventional CDI, the needle indications are reversed, so the pilot corrects by flying away from the needle. An HSI would eliminate this reverse sensing.

38. D — Fuel = 1.5 hr + 0.5 hr + 0.75 hr (45-min reserve) = 2.75 hr × 12 gph = 33.0 gallons. The 45-minute IFR reserve is added after destination and alternate before applying the burn rate.

39. D — The localizer course is tailored to a narrow width so full-scale deflection occurs over only a few degrees, making it far more sensitive than a VOR. This sharper sensitivity supports precise tracking near the runway.

40. C — The correct response to the somatogravic illusion is to trust the attitude indicator and maintain the indicated climb attitude, resisting the false pitch-up sensation. Pushing the nose down would fly the aircraft toward the ground.

41. B — At FL230 the pilot uses 29.92 inches Hg, because all flight levels (at and above 18,000 feet MSL) operate on standard pressure altitude. This common reference places all high-altitude traffic on the same datum.

42. D — On a non-precision approach with a stepdown fix, the pilot must not descend to the MDA until passing the stepdown fix. The higher intermediate altitude protects obstacle clearance until the fix is crossed.

43. A — A missed approach must be reported to ATC at all times, even in radar contact. Intersection crossings, small estimate changes, and VFR-on-top altitudes are not always-required reports.

44. C — The descent is 5,000 feet at 1,000 fpm, taking 5 minutes; at 2.5 NM/min, 5 minutes covers 12.5 NM, so descent begins 12.5 NM before the fix. Descent distance equals descent time times groundspeed.

45. C — IFR operations into Class C airspace require an operative transponder with altitude reporting (Mode C). The transponder enables radar identification and altitude readout for separation.

46. A — The forecast meets the 2,000-and-3 condition exactly, and meeting the values satisfies "at least," so no alternate is required. The thresholds are minimums to meet, not values that must be exceeded.

47. C — "LOC armed" without capture as the aircraft crosses the course means capture did not occur; the pilot monitors and is ready to hand-fly or re-arm the mode. Monitoring the annunciator catches the failed capture before a deviation develops.

48. B — A loss of navigation capability must be reported to ATC at all times, even in radar contact, so ATC can provide vectors and adjust separation. ATC cannot assist with a problem it does not know about.

49. C — Groundspeed = 130 − 30 = 100 knots; 50 NM at 100 knots takes 50 ÷ 100 × 60 = 30 minutes. The headwind reduces groundspeed, lengthening the time.

50. D — With currency lapsed seven calendar months and the grace period passed without regaining it, an instrument proficiency check is required to act as PIC under IFR. Beyond the grace window the pilot can no longer self-certify.

51. D — Because the compass lags on northerly headings (UNOS: Undershoot North), the pilot rolls out before reaching the indicated north heading. Undershooting compensates for the turning error.

52. A — The winds-aloft group "9900" means light and variable wind. It is the standard code for winds too light or variable to assign a direction and speed.

53. D — In severe turbulence near a thunderstorm, the pilot slows to or below maneuvering speed so the aircraft stalls before aerodynamic loads exceed structural limits. Flying faster risks a gust imposing loads beyond the structure's capacity.

54. D — Under 91.175, descending below the DA to land requires the aircraft in a position to land, the required flight visibility, and a required visual reference in sight. A landing clearance, familiarity, or equipment alone does not satisfy the rule.

55. C — The gradient is 4,000 feet over 16 NM = 4,000 ÷ 16 = 250 feet per NM. Descent gradient equals altitude loss divided by distance.

56. B — Radiation fog forms under clear skies, calm wind, and a small temperature-dewpoint spread, as the ground radiates heat and cools the air to saturation. These are the classic dawn conditions for radiation fog.

57. D — On an ILS, the missed approach begins at the decision altitude if the runway environment is not in sight. The continuous vertical guidance makes the go/no-go decision at that altitude.

58. D — At a non-towered airport, the aircraft may not depart IFR before the release time. The release coordinates the departure into the IFR system to maintain separation.

59. C — Engaging the autopilot does not relieve the pilot of monitoring the flight mode annunciations and verifying the automation is doing what is intended. The pilot manages the automation and remains responsible for the flight.

60. B — A clearance void time means the pilot must depart before that time (1900) or the clearance is no longer valid. The expect-departure-clearance time (1845) is when to anticipate release; the void time is the hard deadline.