

PRACTICE EXAM 30 SIMULATION

1. A pilot computes the magnetic heading for a true course of 310° , with 15° east variation and a 5° west deviation. What is the compass heading?

- A. The compass heading is 290 degrees for this course
- B. The compass heading is 300 degrees for this course
- C. The compass heading is 320 degrees for this course
- D. The compass heading is 330 degrees for this course

2. A pilot maintaining 120 knots groundspeed on a 3° glidepath must use what approximate descent rate?

- A. A descent rate of about 300 feet per minute on the glidepath
- B. A descent rate of about 450 feet per minute on the glidepath
- C. A descent rate of about 1,000 feet per minute on the glidepath
- D. A descent rate of about 600 feet per minute on the glidepath

3. A pilot must understand that during an approach, descending below the DA without the required visual references constitutes what?

- A. An acceptable practice when the pilot is confident the runway lies ahead
- B. A permitted maneuver provided the aircraft remains above the touchdown zone
- C. A regulatory violation and a serious risk of controlled flight into terrain
- D. A standard technique used to descend through a thin cloud layer near minimums

4. A pilot computing time-to-station finds the bearing changed 10° in 90 seconds after a 90° turn. What is the approximate time to the station?

- A. The time to the station is about 6 minutes from the present position
- B. The time to the station is about 9 minutes from the present position
- C. The time to the station is about 15 minutes from the present position
- D. The time to the station is about 20 minutes from the present position

5. A pilot must understand that the standard rate turn results in a heading change of what value?

- A. A heading change of 1 degree per second during the standard rate turn
- B. A heading change of 6 degrees per second during the standard rate turn
- C. A heading change of 2 degrees per second during the standard rate turn
- D. A heading change of 3 degrees per second during the standard rate turn

6. A pilot flying an ILS notices the localizer needle is centered but the glideslope needle is fully deflected upward. This indicates the aircraft is where?

- A. The aircraft is left of the localizer course and on the glidepath correctly
- B. The aircraft is right of the localizer course and above the glidepath now
- C. The aircraft is on the localizer course but below the glidepath at this point
- D. The aircraft is on the localizer course but above the glidepath at this point

7. A pilot must understand that a blocked static port with a clear pitot tube in a climb causes the altimeter to do what?

- A. The altimeter reads progressively higher than the actual altitude in the climb
- B. The altimeter drops immediately to zero and remains there during the climb
- C. The altimeter freezes at the altitude where the static port became blocked
- D. The altimeter reads correctly because the pitot pressure compensates fully

8. A pilot must compute fuel for a 3-hour leg burning 9 gallons per hour plus a 45-minute IFR reserve. What total fuel is required?

- A. A total of about 27 gallons including the reserve is required for the leg
- B. A total of about 34 gallons including the reserve is required for the leg
- C. A total of about 45 gallons including the reserve is required for the leg
- D. A total of about 20 gallons including the reserve is required for the leg

9. A pilot must understand that the vertical speed indicator operates by measuring what?

- A. The rate of change of static pressure through a calibrated leak in the case
- B. The difference between the pitot ram pressure and the static pressure values
- C. The gyroscopic precession of a rigid spinning rotor inside the instrument case
- D. The expansion and contraction of an aneroid wafer to the ram air pressure

10. A pilot must understand that for IFR currency, the six required approaches must be accomplished within what period?

- A. Within the preceding 6 calendar months before acting as pilot in command
- B. Within the preceding 12 calendar months before acting as pilot in command
- C. Within the preceding 90 days before acting as pilot in command under IFR
- D. Within the preceding 24 calendar months before acting as pilot in command

11. A pilot encountering a vacuum pump failure in IMC must rely on which instruments for attitude control?

- A. The attitude indicator and heading indicator, which remain fully functional
- B. The turn coordinator, airspeed indicator, altimeter, and magnetic compass
- C. The directional gyro and the vacuum-driven attitude indicator combination

D. The vertical speed indicator alone, as it provides reliable pitch information

12. A pilot must compute the wind correction angle for a 15-knot direct crosswind at a true airspeed of 100 knots. The approximate angle is what?

A. A wind correction angle of about 5 degrees into the crosswind is needed

B. A wind correction angle of about 9 degrees into the crosswind is needed

C. A wind correction angle of about 15 degrees into the crosswind is needed

D. A wind correction angle of about 25 degrees into the crosswind is needed

13. A pilot must understand that the maximum holding airspeed at 14,000 feet MSL for a civil aircraft is what value?

A. The maximum holding speed at 14,000 feet is 175 knots indicated airspeed

B. The maximum holding speed at 14,000 feet is 200 knots indicated airspeed

C. The maximum holding speed at 14,000 feet is 265 knots indicated airspeed

D. The maximum holding speed at 14,000 feet is 230 knots indicated airspeed

14. A pilot transitioning into IMC must immediately do what to avoid spatial disorientation?

A. Rely on physical sensations to confirm the aircraft's attitude continuously

B. Make frequent large head movements to keep the inner ear well adjusted

C. Establish an effective instrument cross-check and trust the indications shown

D. Fixate on the attitude indicator alone, ignoring all the other instruments

15. A pilot must understand that an LPV approach provides minimums comparable to what other approach type?

A. A non-precision localizer-only approach with circling minimums published

- B. A VOR approach with a missed approach point timed from the final fix
- C. A precision ILS approach with a decision altitude and vertical guidance
- D. An NDB approach using relative bearings to the station for the final course

16. A pilot computing pressure altitude at a field elevation of 2,000 feet with an altimeter setting of 30.12 inches Hg should expect what?

- A. The pressure altitude is higher than the field elevation by about 200 feet
- B. The pressure altitude equals the field elevation since the setting is standard
- C. The pressure altitude is about 2,200 feet, higher than the field elevation
- D. The pressure altitude is about 1,800 feet, lower than the field elevation

17. A pilot must understand that "MEA" along an airway guarantees obstacle clearance and what else?

- A. Continuous radar coverage from the controlling air route traffic control center
- B. Acceptable navigation signal reception throughout the airway segment flown
- C. Two-way radio communication coverage with the nearest flight service station
- D. Freedom from all icing and turbulence conditions along the airway segment

18. A pilot must understand that the somatogravic illusion during a go-around acceleration creates what false sensation?

- A. A false sensation of descending, prompting an excessive nose-up correction
- B. A false sensation of banking, prompting an uncommanded roll toward the ground
- C. A false sensation of yawing, prompting unnecessary rudder input on the climb
- D. A false sensation of climbing, prompting a nose-low correction toward terrain

19. A pilot must compute the top-of-descent point to lose 6,000 feet on a 3° path. Approximately how far out should the descent begin?

- A. The descent should begin approximately 20 nautical miles from the point
- B. The descent should begin approximately 6 nautical miles from the point
- C. The descent should begin approximately 60 nautical miles from the point
- D. The descent should begin approximately 3 nautical miles from the point

20. A pilot must understand that "RAIM" must be available for a GPS approach because it provides what?

- A. Integrity monitoring of the satellite signals to ensure position reliability
- B. The vertical guidance signal used for the glidepath on the final approach
- C. The lateral course sensitivity that narrows automatically toward the runway
- D. The communication link between the aircraft and the air traffic controller

21. A pilot must understand that an aircraft's approach category is based on what speed?

- A. The maximum certified cruise speed at the aircraft's service ceiling altitude
- B. The never-exceed speed marked on the airspeed indicator with a red radial line
- C. The maximum gross weight takeoff speed used during the departure climb segment
- D. A speed of 1.3 times the stall speed in landing configuration at maximum weight

22. A pilot in the Northern Hemisphere rolls into a turn from a north heading. During the initial portion of the turn, the magnetic compass will do what?

- A. The compass leads the turn, showing a greater turn than is actually occurring
- B. The compass reads accurately and tracks the turn precisely throughout the maneuver
- C. The compass lags, initially showing a turn in the opposite direction of the actual turn
- D. The compass freezes on the north heading until the turn is fully established and stable

23. A pilot must understand that during a partial-panel approach with a failed attitude indicator, the bank is best controlled by which instrument?

- A. The vertical speed indicator showing the trend of the descent rate accurately
- B. The altimeter showing the trend of the altitude during the approach segment
- C. The turn coordinator showing the rate and direction of any banking motion
- D. The airspeed indicator showing the trend of the airspeed during the descent

24. A pilot must understand that flight into known icing without certified equipment risks what primary hazard?

- A. A minor reduction in cruise speed that is easily managed with added power
- B. A temporary loss of the radio communication function during the encounter
- C. An increase in cabin noise from ice striking the fuselage and the windscreen
- D. Degraded lift, increased weight and drag, and possible loss of control

25. A pilot must compute the indicated airspeed needed for a 90-knot groundspeed with a 20-knot headwind, where TAS equals IAS at that altitude. What is the IAS?

- A. An indicated airspeed of 110 knots is required into the headwind component
- B. An indicated airspeed of 90 knots is required regardless of the wind present
- C. An indicated airspeed of 70 knots is required into the headwind component
- D. An indicated airspeed of 130 knots is required into the headwind component

26. A pilot must understand that the magenta line displayed on a GPS moving map represents what?

- A. The active leg of the flight plan, the course the aircraft should now follow
- B. The selected heading the autopilot is steering toward the next waypoint ahead
- C. The lateral deviation from the desired track in nautical miles displayed digitally

D. The wind vector computed by the air data computer for the current altitude

27. A pilot must understand that the freezing rain encountered on an approach indicates what temperature structure aloft?

- A. A uniformly freezing column of air from the cloud base down to the surface
- B. A warmer layer aloft where rain forms, falling through a freezing layer below
- C. A shallow warm surface layer beneath a deep freezing layer high above it
- D. An isothermal layer at exactly zero degrees throughout the entire column

28. A pilot must understand that the difference between MDA and DA is fundamentally that the DA does what?

- A. The DA applies only to circling approaches at the destination airport always
- B. The DA is always set 200 feet lower than any published MDA at the airport
- C. The DA is a point on the glidepath where a missed approach decision is made
- D. The DA requires the aircraft to level off and search visually for the runway

29. A pilot must compute the load factor in a coordinated level 45° banked turn. The approximate load factor is what?

- A. A load factor of about 1.4 times gravity acts on the aircraft in the turn
- B. A load factor of about 2.0 times gravity acts on the aircraft in the turn
- C. A load factor of about 1.0 times gravity acts on the aircraft in the turn
- D. A load factor of about 3.0 times gravity acts on the aircraft in the turn

30. A pilot must understand that two-way communication failure in IMC requires squawking which transponder code?

- A. The transponder should be set to code 7600 for the communication failure

- B. The transponder should be set to code 7700 for the communication failure
- C. The transponder should be set to code 7500 for the communication failure
- D. The transponder should remain on the last assigned code without change

31. A pilot must understand that a procedure turn must be completed within what distance unless otherwise specified?

- A. Within 5 nautical miles of the procedure turn fix on the approach segment
- B. Within 10 nautical miles of the procedure turn fix on the approach segment
- C. Within 15 nautical miles of the procedure turn fix on the approach segment
- D. Within 20 nautical miles of the procedure turn fix on the approach segment

32. A pilot must understand that hypoxia at high altitude without supplemental oxygen produces what early symptom?

- A. A sharp pain in the ears accompanied by a sudden loss of hearing acuity
- B. A rapid and uncontrollable increase in the rate and depth of the breathing
- C. A sudden drop in body temperature with uncontrollable shivering and chills
- D. Euphoria, impaired judgment, and a degraded ability to perform tasks

33. A pilot must understand that the localizer provides what type of guidance on an ILS approach?

- A. Vertical guidance for the descent path down to the runway touchdown zone
- B. Distance information measured in nautical miles to the runway threshold
- C. Both lateral and vertical guidance combined into a single course indication
- D. Lateral guidance aligning the aircraft with the runway centerline on final

34. A pilot must compute the VOR service volume for a high-altitude VOR between 14,500 and 18,000 feet. What is the standard radius?

- A. The standard service volume radius is 100 nautical miles at that altitude
- B. The standard service volume radius is 40 nautical miles at that altitude
- C. The standard service volume radius is 25 nautical miles at that altitude
- D. The standard service volume radius is 130 nautical miles at that altitude

35. A pilot must understand that "VFR-on-top" while operating IFR requires the pilot to do what?

- A. Cancel the IFR clearance immediately upon climbing above the cloud layer
- B. Descend below the clouds before reaching the destination airport boundary
- C. Comply with VFR cruising altitudes and cloud clearances while on the clearance
- D. Climb above all clouds and remain there for the entire route to the destination

36. A pilot must understand that the most hazardous thunderstorm stage is which, due to coexisting drafts?

- A. The cumulus stage, when the updrafts first begin building the cell vertically
- B. The towering stage, before any precipitation has begun to fall from the cloud
- C. The mature stage, when strong updrafts and downdrafts coexist with precipitation
- D. The dissipating stage, when downdrafts dominate as the cell rains itself out

37. A pilot must understand that the pitot-static system provides input to which group of instruments?

- A. The airspeed indicator, the altimeter, and the vertical speed indicator together
- B. The attitude indicator, the heading indicator, and the turn coordinator together
- C. The magnetic compass, the directional gyro, and the attitude indicator together
- D. The tachometer, the manifold pressure gauge, and the fuel flow indicator together

38. A pilot must understand that "descend via" a STAR clearance authorizes what?

- A. An immediate descent to the lowest altitude published anywhere on the arrival
- B. Descent along the arrival complying with all published altitude and speed restrictions
- C. A descent only after a separate altitude assignment is issued by the controller
- D. A descent at the maximum rate to expedite the arrival into the terminal area

39. A pilot must understand that an attitude and heading reference system (AHRS) in a glass cockpit replaces what?

- A. The pitot-static airspeed indicator and the barometric altimeter instruments
- B. The vacuum-driven attitude indicator and the gyroscopic heading indicator
- C. The communication radios and the navigation receivers in the avionics stack
- D. The engine monitoring gauges and the fuel quantity indicators on the panel

40. A pilot must compute the MDA crossing for a non-precision approach reaching MDA before the missed approach point. The pilot should do what?

- A. Immediately begin the missed approach upon reaching the published MDA value
- B. Descend below the MDA to search for the runway environment beneath the clouds
- C. Maintain the MDA and continue toward the missed approach point as published
- D. Circle at the MDA until visual contact with the runway is finally established

41. A pilot must understand that the difference between rime and clear ice is determined primarily by what?

- A. The altitude at which the icing is encountered during the climb or descent
- B. The airspeed of the aircraft passing through the visible moisture in flight
- C. The size of the supercooled droplets and the rate at which they freeze on contact
- D. The outside air temperature relative to the standard atmospheric lapse rate

42. A pilot must understand that an IFR flight requires fuel to reach the destination, then the alternate, plus what reserve?

- A. A reserve sufficient to fly for an additional 30 minutes at the normal cruise
- B. A reserve sufficient to fly for an additional 45 minutes at the normal cruise
- C. A reserve sufficient to fly for an additional 60 minutes at the normal cruise
- D. No additional reserve beyond reaching the alternate airport is required by rule

43. A pilot must understand that "MOCA" guarantees obstacle clearance and navigation signal reception within what distance of the VOR?

- A. Navigation signal reception is guaranteed within 40 nautical miles of the station
- B. Navigation signal reception is guaranteed within 30 nautical miles of the station
- C. Navigation signal reception is guaranteed within 22 nautical miles of the station
- D. Navigation signal reception is guaranteed within 100 nautical miles of the station

44. A pilot must understand that a "clearance void time" issued for a departure requires what?

- A. Departure at exactly the void time to ensure proper separation from other traffic
- B. Holding on the ground until the void time before commencing the takeoff roll
- C. Requesting a new clearance after the void time regardless of the departure status
- D. Departure before the void time, after which the clearance is no longer valid

45. A pilot must understand that the time of useful consciousness following a rapid decompression at altitude refers to what?

- A. The time the supplemental oxygen system can continue to supply the flight crew
- B. The time required for the cabin to fully equalize with the outside atmosphere
- C. The time before the aircraft must descend to a safe breathing altitude below

D. The time during which the crew can perform purposeful actions without oxygen

46. A pilot must understand that "RNP 0.3" on an approach requires the aircraft to remain within what lateral accuracy?

A. Within 0.3 nautical mile of centerline for 95 percent of the flight time

B. Within 0.3 degrees of the final approach course throughout the approach

C. Within 0.3 statute mile of the threshold during the final approach segment only

D. Within a 0.3 nautical mile vertical band above the published minimum altitude

47. A pilot must understand that the green arc on a glass-cockpit airspeed tape indicates what?

A. The normal operating speed range for the current aircraft configuration

B. The flap operating range from the full-flap to the flaps-up configuration

C. The caution range where operations should be limited to smooth air conditions

D. The never-exceed speed beyond which structural damage may occur in flight

48. A pilot must understand that an occluded front forms when what occurs in the atmosphere?

A. Two warm fronts merge together over a region of high atmospheric pressure

B. A stationary front begins to move rapidly toward a nearby low-pressure center

C. A faster cold front overtakes a slower warm front, lifting the warm air aloft

D. A cold front and a warm front move parallel without interacting with each other

49. A pilot must understand that descending below the MDA on a non-precision approach is authorized only when what condition is met?

A. The pilot has positively identified the location of the missed approach point

B. ATC has issued a specific clearance to land on the assigned runway surface

- C. The required visual references are distinctly visible and the aircraft is positioned to land
- D. The reported visibility has increased above the published minimum for the approach

50. A pilot must understand that the autopilot in "approach" mode coupled to an LPV will do what?

- A. Track only the lateral course while the pilot manually controls the descent rate
- B. Level the aircraft at the final approach fix altitude until reaching the runway
- C. Disconnect automatically at the final approach fix, requiring a hand-flown descent
- D. Track the lateral course and follow the computed glidepath down to the minimums

51. A pilot must understand that the standard missed approach climb gradient, when not otherwise published, is what value?

- A. A standard missed approach climb gradient of 100 feet per nautical mile applies
- B. A standard missed approach climb gradient of 500 feet per nautical mile applies
- C. A standard missed approach climb gradient of 152 feet per nautical mile applies
- D. A standard missed approach climb gradient of 200 feet per nautical mile applies

52. A pilot must understand that the magnetic compass exhibits the greatest acceleration error on which headings?

- A. The acceleration error is greatest on the east and west headings during speed changes
- B. The acceleration error is greatest on the north and south headings during turns made
- C. The acceleration error is greatest on the northeast and southwest headings only
- D. The acceleration error is equal on all headings during any acceleration event aloft

53. A pilot must understand that "TAWS" provides the pilot with what function during flight?

- A. Traffic advisories and resolution guidance to avoid other aircraft in the vicinity

- B. Alerts of potential terrain or obstacle conflicts ahead along the flight path
- C. Weather radar returns overlaid on the multifunction display moving map screen
- D. Automatic engine parameter monitoring and a prediction of impending failures

54. A pilot must understand that the "1-2-3 rule" requires filing an alternate when the forecast shows what?

- A. A ceiling below 3,000 feet and visibility below 5 miles around the arrival time
- B. A ceiling below 1,000 feet and visibility below 2 miles around the arrival time
- C. A ceiling below 2,500 feet and visibility below 4 miles around the arrival time
- D. A ceiling below 2,000 feet or visibility below 3 miles around the arrival time

55. A pilot must understand that the inclinometer ball moving to the outside of a turn indicates what?

- A. A slipping turn, requiring less rudder or more bank to coordinate the turn
- B. A skidding turn, requiring less rudder or more bank to coordinate the turn
- C. A coordinated turn, requiring no change to the rudder or aileron inputs at all
- D. A stalled condition, requiring an immediate reduction in the angle of bank used

56. A pilot must understand that the VOR equipment for IFR must be checked for accuracy within what interval?

- A. Within the preceding 30 days before the IFR flight using an approved check
- B. Within the preceding 12 calendar months before the IFR flight by a technician
- C. Within the preceding 24 calendar months before the IFR flight by a repair station
- D. Within the preceding 6 calendar months before the IFR flight by the pilot only

57. A pilot must understand that "advection fog" forms by what specific process?

- A. Nighttime radiational cooling of the ground beneath a clear and calm sky overhead
- B. Air cooling adiabatically as it is forced to rise over a mountain barrier slowly
- C. Precipitation falling through a dry layer and evaporating into the air below it
- D. Moist air moving horizontally over a colder surface and cooling to its dew point

58. A pilot must understand that the final approach fix on a non-precision approach is depicted on the profile by what symbol?

- A. A lightning bolt symbol marking the visual descent point on the final segment
- B. A Maltese cross symbol marking the final approach fix on the profile view
- C. A solid black triangle marking the missed approach holding point on the chart
- D. A feathered arrow marking the procedure turn direction at the intermediate fix

59. A pilot must understand that an autopilot "mode reversion" during an approach occurs when what happens?

- A. The pilot manually selects a new navigation source during the final approach segment
- B. The autopilot drops from a captured mode to a default mode without pilot input
- C. The flight director command bars are intentionally biased out of the pilot's view
- D. The navigation database automatically updates to the next cycle while in flight

60. A pilot must understand that the most reliable countermeasure against spatial disorientation in IMC is to do what?

- A. Establish a disciplined instrument cross-check and trust the flight instruments
- B. Rely on the vestibular sensations to confirm the actual attitude of the aircraft
- C. Make frequent and deliberate head movements to recalibrate the inner ear balance
- D. Focus exclusively on the attitude indicator while ignoring the other instruments

Answer Key

1. B. 300 degrees — $MH = 310 - 15$ (E var) = 295; $CH = 295 + 5$ (W dev) = 300°.
2. D. ~600 fpm — Descent rate $\approx GS \times 5 = 120 \times 5 = 600$ fpm for a 3° path.
3. C. Violation/CFIT risk — Descending below DA without the required visual references is a regulatory violation and a serious CFIT risk.
4. B. ~9 minutes — Time to station = $(60 \times \text{minutes}) \div \text{degrees} = (60 \times 1.5) \div 10 = 9$ min.
5. D. 3 degrees per second — A standard rate turn is 3°/second (a 2-minute turn).
6. C. On localizer, below glidepath — A centered localizer with the glideslope deflected upward means on course laterally but below the glidepath (fly up to the needle).
7. C. Freezes at blockage altitude — A blocked static port freezes the altimeter at the altitude where the blockage occurred.
8. B. ~34 gallons — $3 \text{ h} \times 9 \text{ gph} = 27 \text{ gal}$; + 45-min reserve $(0.75 \times 9 = 6.75) = 33.75 \approx 34 \text{ gal}$.
9. A. Calibrated leak/static rate — The VSI measures the rate of static pressure change through a calibrated leak.
10. A. 6 calendar months — IFR currency approaches must be accomplished within the preceding 6 calendar months.
11. B. TC, ASI, altimeter, compass — With vacuum failure, control attitude using the turn coordinator, airspeed indicator, altimeter, and magnetic compass.
12. B. ~9 degrees — $WCA = \arcsin(15 \div 100) \approx 8.6^\circ$, rounded to ~9°.

13. D. 230 knots — Maximum holding speed at 14,000 ft (6,001–14,000 band) is 230 KIAS.
14. C. Cross-check, trust — Spatial disorientation is avoided by an effective instrument cross-check and trusting the indications.
15. C. ILS-comparable — LPV provides minimums comparable to a precision ILS, with a decision altitude and vertical guidance.
16. D. ~1,800 feet, lower — $PA = elev + (29.92 - 30.12) \times 1,000 = 2,000 - 200 = 1,800$ ft, lower than field elevation.
17. B. Nav signal reception — MEA guarantees obstacle clearance plus acceptable navigation signal reception.
18. D. False climb, nose-low risk — The somatogravic illusion in a go-around creates a false climb sensation, risking a nose-low correction.
19. A. ~20 NM — At 300 ft/NM on a 3° path, 6,000 ft requires 20 NM.
20. A. Integrity monitoring — RAIM provides integrity monitoring of satellite signals to ensure position reliability.
21. D. $1.3 \times V_{so}$ — Approach category is based on 1.3 times the stall speed in landing configuration at max weight.
22. C. Lags on north turns — Northerly turning error: when turning from a north heading in the Northern Hemisphere, the compass initially lags and may briefly indicate a turn in the opposite direction before catching up (the "UNOS" — Undershoot North, Overshoot South — behavior). This replaces the duplicated acceleration-error concept with turning error, so Q22 (turning error) and Q52 (acceleration error) now test distinct compass behaviors while keeping key letter C and balanced option lengths.

23. C. Turn coordinator — With a failed attitude indicator, bank is best controlled by the turn coordinator.
24. D. Lift/weight/drag, control loss — Icing without certified equipment degrades lift, increases weight and drag, and risks loss of control.
25. A. 110 knots — With $TAS = IAS$ and a 20-kt headwind, GS 90 means $IAS = 90 + 20 = 110$ kt.
26. A. Active leg course — The magenta line is the active flight-plan leg, the course to currently follow.
27. B. Warm aloft, freezing below — Freezing rain indicates a warmer layer aloft where rain forms, falling into a freezing layer below.
28. C. Glidepath decision point — DA is a point on the glidepath where the missed-approach decision is made (no level-off, unlike MDA).
29. A. ~ 1.4 G — Load factor in a 45° level turn = $1/\cos 45^\circ \approx 1.41$ G.
30. A. Code 7600 — Two-way communication failure is squawk 7600.
31. B. 10 nautical miles — A procedure turn must be completed within 10 NM unless otherwise specified.
32. D. Euphoria, impaired judgment — Early hypoxia symptoms include euphoria, impaired judgment, and degraded task performance.
33. D. Lateral guidance — The localizer provides lateral guidance aligning the aircraft with the runway centerline.
34. A. 100 NM — A high-altitude VOR service volume (14,500–18,000 ft) is 100 NM radius.

35. C. VFR altitudes/clearances — "VFR-on-top" requires complying with VFR cruising altitudes and cloud clearances while on the IFR clearance.
36. C. Mature stage — The mature stage is most hazardous, with coexisting strong updrafts and downdrafts plus precipitation.
37. A. ASI, altimeter, VSI — The pitot-static system feeds the airspeed indicator, altimeter, and vertical speed indicator.
38. B. Comply with restrictions — "Descend via" authorizes descent along the arrival complying with all published altitude and speed restrictions.
39. B. Vacuum AI and HI — AHRS replaces the vacuum-driven attitude indicator and gyroscopic heading indicator.
40. C. Maintain MDA to MAP — Reaching MDA before the MAP, maintain MDA and continue toward the missed approach point.
41. C. Droplet size/freeze rate — Rime vs. clear ice is determined by supercooled droplet size and the rate at which they freeze.
42. B. 45 minutes — IFR fuel reserve is 45 minutes at normal cruise beyond the destination and alternate.
43. C. Within 22 NM — MOCA guarantees navigation signal reception within 22 NM of the VOR.
44. D. Depart before void time — A clearance void time requires departure before that time, after which it is invalid.
45. D. Purposeful action time — Time of useful consciousness is the time the crew can perform purposeful actions without oxygen.

46. A. Within 0.3 NM, 95% — RNP 0.3 requires staying within 0.3 NM of centerline at least 95% of the time.
47. A. Normal operating range — The green arc on a glass airspeed tape marks the normal operating speed range.
48. C. Cold overtakes warm — An occluded front forms when a faster cold front overtakes a slower warm front, lifting the warm air aloft.
49. C. Visual references, positioned — Descent below MDA requires the required visual references be distinctly visible and the aircraft positioned to land.
50. D. Track course and glidepath — In approach mode coupled to an LPV, the autopilot tracks the lateral course and follows the computed glidepath to minimums.
51. D. 200 ft/NM — The standard missed approach climb gradient, when unpublished, is 200 ft/NM.
52. A. East/west — Acceleration error is greatest on east and west headings during speed changes.
53. B. Terrain/obstacle alerts — TAWS provides alerts of potential terrain or obstacle conflicts ahead.
54. D. 2,000 or 3 — The 1-2-3 rule requires an alternate when the forecast shows a ceiling below 2,000 ft or visibility below 3 SM.
55. B. Skidding turn — The ball moving to the outside indicates a skidding turn (correct with less rudder or more bank).
56. A. Within 30 days — VOR equipment for IFR must be checked within the preceding 30 days.
57. D. Moist air over cold surface — Advection fog forms when moist air moves horizontally over a colder surface and cools to its dew point.

58. B. Maltese cross — The FAF on a non-precision approach profile is marked by the Maltese cross.

59. B. Drops to default — Mode reversion is when the autopilot drops from a captured mode to a default mode without pilot input.

60. A. Cross-check, trust — The most reliable countermeasure to spatial disorientation is a disciplined cross-check and trusting the instruments.