PRACTICE EXAM 13 (60 QUESTIONS)

1. Why does a spinning gyroscope resist forces that attempt to tilt its axis, allowing the attitude indicator to maintain a stable horizon reference?

A. Rigidity in space, the gyroscope's tendency to remain fixed in its plane of rotation

B. Precession, which transfers the force 90 degrees in the direction of rotation

C. Magnetic dip, which anchors the rotor toward the nearest pole

D. Centripetal acceleration acting on the gimbal bearings

2. A pilot wonders why the airspeed indicator alone is affected by a blocked pitot tube while the altimeter is not. What is the underlying reason?

A. The airspeed indicator is the only instrument that uses ram (pitot) pressure

B. The altimeter is electrically driven and independent of air pressure

C. The pitot tube supplies static pressure to all three instruments

D. The altimeter uses a separate gyroscopic sensing element

3. Why does true airspeed increase relative to indicated airspeed as an aircraft climbs at a constant indicated airspeed?

A. The pitot tube becomes more efficient at altitude

B. The airspeed indicator mechanically over-reads in thin air

C. Air density decreases with altitude, so the same indicated airspeed represents a higher true speed

D. The static pressure increases, inflating the reading

4. A pilot asks why the magnetic compass is unreliable during a turn onto a northerly heading. What is the cause?

A. Electrical interference from the turn coordinator

B. Magnetic dip causes the compass card to lag, leading to undershooting north

C. The compass fluid freezes at high latitudes

D. Precession of the compass float assembly

5. Why is a VOR signal limited to line-of-sight reception?

A. It is intentionally encrypted for security

B. It uses a low-frequency ground wave that follows terrain

C. The signal is absorbed by atmospheric moisture

D. It operates in the VHF band, which does not bend around terrain or the horizon

6. A pilot wants to understand why DME indicates slant range rather than ground distance. What explains this?

A. DME corrects for Earth's curvature, overstating distance

B. DME measures magnetic bearing, not distance

C. The signal reflects off the ionosphere, lengthening the path

D. DME measures the straight-line distance from aircraft to station, which exceeds ground distance at altitude

7. Why does RAIM require at least five satellites (or four plus baro-aiding) to detect a faulty signal, when only four are needed for a position fix?

A. The fifth satellite provides the altitude component

B. The extra satellite provides redundant information to identify an inconsistent signal

C. Five satellites are needed only for WAAS approaches

D. The fifth satellite transmits the integrity message directly

8. Why does WAAS enable vertically guided approaches that basic GPS cannot support?

A. WAAS uses a separate satellite constellation in geostationary orbit only

B. WAAS replaces GPS entirely with ground-based signals

C. WAAS increases the number of usable satellites to twelve

D. WAAS provides correction data and integrity monitoring that improve accuracy enough for vertical guidance

9. A pilot asks why a localizer is more sensitive than a VOR on final approach. What is the reason?

A. The localizer transmits on a lower frequency that increases gain

B. The localizer includes a glide slope that sharpens the course

C. The localizer uses a rotating antenna that narrows the beam

D. The localizer course is tailored to a narrow width so full-scale deflection occurs over a few degrees

10. Why does the attitude indicator in a vacuum-driven system fail silently and dangerously when the vacuum pump quits?

A. It immediately displays a red warning flag and tumbles

B. It switches automatically to electrical backup without notice

C. The gyro slowly spins down, presenting a plausible but increasingly false attitude

D. It freezes instantly at the last correct indication

11. Why is the standard-rate turn defined as 3 degrees per second?

A. It completes a 360-degree turn in two minutes, a convenient and controllable benchmark

B. It is the maximum bank angle structurally permitted in IMC

C. It matches the precession rate of the heading indicator

D. It is the slowest turn the autopilot can execute

12. A pilot wonders why instrument cruising altitudes are flown at exact thousands while VFR altitudes add 500 feet. What is the rationale?

A. Separating IFR and VFR traffic vertically by 500 feet reduces collision risk

B. IFR aircraft fly higher and need round numbers for oxygen planning

C. The altimeter cannot display half-thousand values under IFR

D. ATC radar only reads exact thousands

13. Why does a small temperature-dewpoint spread indicate a likelihood of fog or low clouds?

A. A large spread means the air is already saturated

B. A small spread means the air is near saturation, so slight cooling produces condensation

C. The spread measures atmospheric pressure changes

D. A small spread indicates rising air and instability only

14. Why does a cold front typically produce more violent but shorter-lived weather than a warm front?

A. Cold fronts carry more moisture than warm fronts

B. The steep frontal slope forces warm air upward rapidly, concentrating convective activity

C. Cold fronts move slower, allowing weather to build over days

D. Warm fronts are always associated with thunderstorms

15. Why does structural icing degrade aircraft performance so severely?

A. Ice disrupts the airfoil shape and adds weight and drag, reducing lift

B. Ice increases lift but reduces controllability

C. Ice only affects radio antennas, not aerodynamics

D. Ice lowers the stall speed, making the aircraft unstable

16. A pilot asks why datalink NEXRAD imagery must not be used to thread between thunderstorm cells. What is the fundamental reason?

A. NEXRAD cannot detect precipitation at all

B. The displayed image is older than its timestamp indicates, and cells move and develop in that interval

C. NEXRAD only updates once per flight

D. The image shows only cloud tops, not precipitation

17. Why does the wind around a Northern Hemisphere low-pressure system flow counterclockwise and inward?

A. The Coriolis effect alone, with no pressure gradient

B. The pressure gradient drives air inward while the Coriolis effect deflects it, producing counterclockwise inflow

C. Friction reverses the flow direction near the surface

D. Low pressure causes air to sink and rotate clockwise

18. Why is spatial disorientation so dangerous in instrument conditions?

A. The instruments become unreliable in cloud

B. The autopilot cannot function without a visible horizon

C. Radio navigation fails when the pilot is disoriented

D. The body's vestibular system produces false sensations that conflict with the instruments

19. A pilot wonders why an aft center-of-gravity is especially hazardous in IMC. What is the reason?

A. An aft CG raises the stall speed dramatically

B. An aft CG improves stall recovery but reduces cruise speed

C. An aft CG reduces longitudinal stability, making unusual-attitude recovery more difficult

D. An aft CG has no effect on stability, only on fuel burn

20. Why does the FAA require a 45-minute fuel reserve for IFR rather than the 30-minute VFR day reserve?

A. IFR aircraft burn fuel faster than VFR aircraft

B. The reserve accounts for the longer runways at IFR airports

C. IFR operations involve greater uncertainty from weather, holding, and approaches, warranting a larger margin

D. The 45-minute figure matches the holding clearance limit

21. Why does the 1-2-3 rule use a window from 1 hour before to 1 hour after the ETA rather than just the ETA?

A. It matches the validity period of a TAF

B. Forecasts are imprecise, so a window ensures conditions are adequate around the expected arrival

C. ATC requires a two-hour buffer for sequencing

D. The window corresponds to the fuel reserve requirement

22. A pilot asks why the MOCA guarantees navigation reception only within 22 NM of the VOR while the MEA guarantees it for the whole segment. What is the reason?

A. The MOCA is always higher than the MEA

B. The MOCA applies only above 18,000 feet

C. The MEA is based on radar coverage, not navaids

D. The MOCA's lower altitude limits reliable VOR signal reception to a shorter range

23. Why must a pilot tune and identify a navaid by its Morse code before using it for navigation?

A. To confirm the station is operating and transmitting the correct identifier

B. To synchronize the DME with the VOR

C. To activate the glide slope receiver

D. To reset the heading indicator to the station

24. Why does reverse sensing occur on a VOR when the OBS course disagrees with the direction of flight?

A. The DME fails when the course is set incorrectly

B. The CDI shows deviation relative to the selected course, so an opposite setting reverses left/right indications

C. The VOR transmits a reversed signal beyond its service volume

D. The receiver gain inverts at high altitude

25. Why is a holding pattern's inbound leg timed at 1 minute at or below 14,000 feet but 1.5 minutes above?

A. Higher true airspeeds at altitude would otherwise enlarge the pattern beyond protected airspace

B. The longer leg conserves fuel at altitude

C. ATC requires longer legs for radar identification

D. The compass is less reliable at altitude, requiring more time

26. A pilot wonders why a procedure turn is not required when receiving radar vectors to the final approach course. What is the reason?

A. Radar vectors are only used in VMC

B. The procedure turn is replaced by a DME arc automatically

C. Vectors already align the aircraft with the final approach course, making the reversal unnecessary

D. The procedure turn is only for precision approaches

27. Why does an ILS glide slope have potentially hazardous false signals above the true glide path?

A. The glide slope antenna radiates additional lobes at higher angles

B. The localizer interferes with the glide slope above the path

C. The marker beacons reflect the signal upward

D. The DME creates harmonic distortion

28. Why must a pilot not descend below the MDA on a non-precision approach unless the required visual references are in sight?

A. The MDA is the lowest altitude guaranteeing obstacle clearance without visual confirmation of the runway

B. The MDA is a recommended altitude that may be exceeded with caution

C. Descending below the MDA improves the glide slope capture

D. The MDA applies only to precision approaches

29. Why are aircraft approach categories based on 1.3 times the stall speed in landing configuration?

A. It corresponds to the maximum structural cruising speed

B. It approximates a safe final approach speed, which determines the turning radius and protected airspace

C. It matches the never-exceed speed for each aircraft

D. It is the speed at which the autopilot disconnects

30. Why does a circling approach require more protected airspace and higher minimums than a straight-in approach?

A. Circling approaches use a steeper descent angle

B. Circling is flown only at night, requiring extra margin

C. The aircraft maneuvers visually at low altitude, requiring greater obstacle clearance around the airport

D. Circling approaches lack lateral guidance entirely

31. A pilot asks why the missed approach on a precision approach begins at the Decision Altitude rather than a separate point. What is the reason?

A. The DA is always at the runway threshold

B. With continuous vertical guidance, the decision to continue or go around is made precisely at the DA

C. The missed approach point is undefined on precision approaches

D. The DA is determined by the missed approach climb gradient

32. Why does a vacuum failure leave the turn coordinator operational in a typical light aircraft?

A. The turn coordinator is electrically driven, independent of the vacuum system

B. The turn coordinator uses pitot pressure instead of vacuum

C. The turn coordinator shares the vacuum pump but has a backup

D. The turn coordinator is a non-gyroscopic instrument

33. Why must heading changes be flown as timed turns when the heading indicator has failed?

A. The attitude indicator cannot display heading

B. Timed turns are faster than compass turns

C. The magnetic compass is unreliable during the turn itself, so timing provides an accurate reference

D. The turn coordinator cannot show direction of turn

34. Why does a pilot recovering from a nose-low unusual attitude level the wings before raising the nose?

A. Raising the nose first reduces airspeed too quickly

B. Leveling the wings restores the heading indicator

C. The attitude indicator requires wings level to function

D. Pulling while banked tightens the turn and increases load factor, risking overstress

35. Why is "get-there-itis" considered such a dangerous external pressure?

A. It causes mechanical failures in the aircraft

B. It is a regulatory violation in itself

C. It pressures pilots to continue into deteriorating conditions beyond safe limits

D. It only affects inexperienced pilots

36. Why does the FAA emphasize that a legal flight may still be unsafe?

A. Regulations are frequently incorrect

B. Legal minimums always exceed safe margins

C. Regulations set a floor that does not account for individual currency, fatigue, or specific conditions

D. ATC determines safety, not regulations

37. A pilot asks why the somatogravic illusion is most dangerous on a dark-night or IMC takeoff. What is the reason?

A. Forward acceleration feels like a nose-up pitch, tempting a nose-down input toward the ground with no horizon to correct it

B. Deceleration on climb-out feels like a roll

C. The illusion only occurs above 10,000 feet

D. The pitot system freezes during acceleration

38. Why does flying from warm air into significantly colder air without resetting the altimeter make true altitude lower than indicated?

A. Cold air increases the aircraft's weight

B. The altimeter setting changes automatically in cold air

C. Cold, dense air lowers the actual height for a given indicated altitude, since the altimeter cannot sense temperature

D. The static port contracts in cold temperatures

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

A. Radar cannot detect the aircraft without navigation equipment

B. It is only required outside radar contact

C. The report is optional in radar contact

D. ATC needs to know so it can provide vectors and adjust separation and handling

40. Why does a glass cockpit require independent backup instruments that a traditional panel may not?

A. Glass cockpits are less reliable than steam gauges

B. Backup instruments are required only for night flight

C. The displays are too bright to read in sunlight

D. Multiple displayed parameters can share a single ADC or AHRS, so one failure may remove several indications at once

41. Why is the airspeed indicator considered the primary pitch reference in a constant-airspeed climb once established?

A. The altimeter is unusable in a climb

B. In a constant-airspeed climb, holding the target airspeed is the goal, so the airspeed indicator most directly shows pitch performance

C. The VSI is primary for bank in a climb

D. The attitude indicator fails during climbs

42. Why does the FAA require the navigation database to be current for IFR approaches?

A. Expired databases drain the battery faster

B. Procedures, waypoints, and altitudes change, and outdated data can present incorrect or unsafe guidance

C. The database affects only the moving map display

D. WAAS requires monthly updates regardless of use

43. A pilot asks why an ODP may be flown without specific ATC assignment while a SID must be assigned. What is the underlying difference in purpose?

A. ODPs are only for turbine aircraft

B. SIDs provide obstacle clearance and ODPs provide traffic flow

C. ODPs are flown only in VMC

D. ODPs exist for obstacle clearance, a pilot responsibility, while SIDs serve ATC traffic management

44. Why does the cone of confusion exist directly over a VOR station?

A. The signal is transmitted upward in a cone where the receiver cannot determine a usable radial

B. The DME blocks the VOR signal overhead

C. The station ceases transmitting when an aircraft is overhead

D. Magnetic interference inverts the radials over the station

45. Why is a stabilized constant-descent approach preferred over a "dive and drive" on non-precision approaches?

A. It permits descent below the MDA without visual references

B. It allows a steeper descent to save time

C. A continuous stabilized descent reduces the risk of controlled flight into terrain near stepdown fixes

D. It eliminates the need to identify the missed approach point

46. Why must a pilot lead the level-off when climbing or descending to a target altitude?

A. The altimeter lags behind the actual altitude

B. ATC requires a specific lead distance

C. The VSI must be reset at each altitude

D. Anticipating the level-off by about 10 percent of the vertical speed prevents overshooting the altitude

47. A pilot asks why freezing rain is among the most hazardous icing conditions. What is the reason?

A. Freezing rain is always accompanied by hail

B. Freezing rain occurs only in thunderstorms

C. Freezing rain forms light rime ice that is easily shed

D. Freezing rain indicates warmer air aloft and can produce rapid clear-ice accumulation

48. Why does the FAA structure airways with defined minimum altitudes like the MEA?

A. To guarantee both obstacle clearance and reliable navigation signal coverage along the segment

B. To standardize fuel consumption across aircraft types

C. To separate IFR traffic from military operations

D. To define the maximum speed permitted on the airway

49. Why is the lost-communication aircraft directed to fly the highest of the assigned, minimum, or expected altitude for each segment?

A. To conserve fuel by climbing as high as possible

B. To improve radio reception at higher altitudes

C. To match the cruising altitude rules for the magnetic course

D. To guarantee terrain and obstacle clearance throughout the route when no current clearance exists

50. Why does the FAA assign discrete transponder codes to IFR aircraft rather than leaving them on 1200?

A. The 1200 code disables Mode C altitude reporting

B. Discrete codes are required only above 18,000 feet

C. The 1200 code interferes with the localizer

D. A discrete code lets ATC radar uniquely identify and track each IFR flight

51. A pilot asks why the attitude and heading indicators rely on rigidity in space while the turn coordinator relies on precession. What does this reflect?

A. The instruments use different power sources exclusively

B. Each instrument exploits the gyroscopic property best suited to what it measures

C. Precession is a malfunction that the turn coordinator tolerates

D. Rigidity and precession are the same property under different names

52. Why does an aircraft on an IFR clearance fly the altitude assigned by ATC even when other altitudes would be legal for the course?

A. Assigned altitudes are always lower than cruising-rule altitudes

B. The cruising-altitude rules do not apply to any IFR flight

C. ATC separates IFR traffic, so it assigns altitudes to maintain that separation

D. Pilots may choose any altitude once cleared

53. Why is the magnetic compass the only instrument that requires no external power, making it the ultimate backup?

A. It uses a small internal battery for illumination only

B. It operates by a magnetized element aligning with Earth's magnetic field, needing no engine or electrical input

C. It is driven by the pitot-static system

D. It contains a self-charging gyroscope

54. Why does the FAA require an instrument proficiency check after currency has lapsed beyond the grace period?

A. To verify the pilot's instrument knowledge and skill before resuming IFR privileges

B. To renew the medical certificate

C. To update the navigation database

D. To re-issue the instrument rating, which expires

55. A pilot asks why the briefing strip is placed at the top of the approach chart. What is the design rationale?

A. To present the most critical information for efficient briefing before the approach

B. To list the airport's runway dimensions only

C. To display the enroute frequencies for the next sector

D. To show the missed approach holding fix coordinates exclusively

56. Why does the FAA define a ceiling as only the lowest broken or overcast layer, not few or scattered?

A. Few and scattered layers are always above 12,000 feet

B. Broken and overcast layers are reported in feet, scattered layers in meters

C. Broken or overcast layers obscure enough sky to determine whether an approach can break out, while few/scattered do not constitute a ceiling

D. Scattered layers are forecast, not observed

57. Why must a pilot slow to maneuvering speed (V_A) in severe turbulence?

A. Slowing reduces fuel consumption during the encounter

B. At or below V_A, the aircraft stalls before aerodynamic loads exceed structural limits

C. V_A is the speed at which the autopilot engages turbulence mode

D. Slowing improves radio reception in turbulence

58. Why does the FAA require approaches for currency to be flown in actual or simulated instrument conditions?

A. To ensure the pilot practices in good weather only

B. Approaches in VMC are easier and count double

C. Only instrument conditions exercise the skills the currency requirement is meant to preserve

D. Simulated conditions are prohibited for currency

59. A pilot asks why the localizer back course can produce reverse sensing without an HSI. What is the reason?

A. The back course transmits a weaker signal

B. The back course includes a reversed glide slope

C. The CDI deflection is relative to the front-course orientation, so flying the back course reverses the left/right sense

D. The back course operates on a different frequency band

60. Why is single-pilot resource management considered essential in IFR operations?

A. It eliminates the need for an autopilot

B. It requires a second pilot on all IFR flights

C. It replaces the need for weather briefings

D. A single pilot must manage all resources—automation, ATC, weather, and attention—without crew assistance

+ Answer Key

1. A — Rigidity in space is the gyroscopic property by which a spinning rotor remains fixed in its plane of rotation, resisting tilting forces. This fixed reference lets the attitude indicator display the aircraft moving around the stable gyro, presenting a reliable artificial horizon.

2. A — The airspeed indicator is the only instrument that uses ram (pitot) pressure, comparing it against static pressure. The altimeter and VSI use static pressure alone, so a pitot blockage affects only the airspeed indicator.

3. C — Air density decreases with altitude, so for a given indicated airspeed the aircraft moves faster through the thinner air—true airspeed rises. The airspeed indicator senses dynamic pressure, which understates true speed as density falls.

4. B — Magnetic dip pulls the compass card downward toward the pole, causing it to lag on a turn to north, so the pilot undershoots the heading. This turning error is most pronounced near north and south (the basis of UNOS).

5. D — The VOR operates in the VHF band, whose signals travel essentially in straight lines and do not bend around terrain or the horizon. Reception is therefore line-of-sight, improving with altitude and degraded by intervening obstructions.

6. D — DME measures the straight-line (slant-range) distance from aircraft to station, which exceeds the ground distance at altitude. The error is greatest close to the station at high altitude, where the slant path is much longer than the ground track.

7. B — A fifth satellite (or four plus baro-aiding) provides redundant information that lets RAIM identify a single inconsistent signal. Without redundancy beyond the four needed for a fix, the receiver could not detect that one satellite was faulty.

8. D — WAAS broadcasts correction data and integrity monitoring from ground reference stations via geostationary satellites, improving accuracy enough to support vertical guidance. This added precision and integrity is what basic GPS lacks for vertically guided approaches.

9. 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 to the runway centerline.

10. C — On a vacuum failure, the gyro slowly spins down, so the attitude indicator presents a plausible but increasingly false attitude rather than an obvious failure flag. This silent degradation can lead a pilot into a spiral if not caught by cross-check.

11. A — A standard-rate turn of 3°/sec completes a 360° turn in two minutes, a convenient and controllable benchmark for instrument maneuvering. It also underlies timed turns used when the heading indicator fails.

12. A — Flying IFR at exact thousands and VFR at thousands-plus-500 separates the two traffic types vertically by 500 feet, reducing collision risk. The offset keeps IFR and VFR aircraft on different altitudes for the same course.

13. B — A small temperature-dewpoint spread means the air is near saturation, so slight cooling readily produces condensation as fog or low cloud. As the spread approaches zero, visibility tends to deteriorate.

14. B — A cold front's steep slope forces warm air upward rapidly, concentrating convective activity into a narrow, intense, fast-moving band. The result is violent but short-lived weather, unlike the broad, gentle lifting of a warm front.

15. A — Ice disrupts the airfoil's shape and adds weight and drag, reducing lift and degrading performance. The disturbed airflow can raise stall speed and reduce control effectiveness, making icing a serious hazard.

16. B — Datalink NEXRAD imagery is older than its timestamp suggests due to processing and transmission delays, and cells move and develop during that interval. This latency makes it unsafe for close-in tactical avoidance, suitable only for strategic planning.

17. B — Around a Northern Hemisphere low, the pressure gradient drives air inward while the Coriolis effect deflects it to the right, producing counterclockwise inflow. The balance of these forces, modified by friction near the surface, yields the inward spiral that lifts air and forms clouds.

18. D — In cloud the body's vestibular system produces false sensations of attitude and motion that conflict with the instruments. Acting on these sensations rather than the instruments leads to loss of control, which is why trusting the instruments is the defense.

19. C — An aft CG reduces longitudinal stability, making the aircraft more difficult to recover from a stall or unusual attitude—a grave hazard in IMC. Reduced stability means small disturbances grow more readily without visual cues to correct them.

20. C — IFR operations carry greater uncertainty from weather, holding, and approaches, so the FAA requires a larger 45-minute reserve than the 30-minute VFR day reserve. The extra margin guards against delays inherent in the IFR system.

21. B — Forecasts are imprecise, so the 1-hour-before-to-1-hour-after window ensures conditions are adequate around the expected arrival, not just at a single instant. This buffer accounts for weather arriving earlier or later than predicted.

22. D — The MOCA's lower altitude limits reliable VOR signal reception to within 22 NM of the station, even though obstacle clearance is assured for the whole segment. The MEA, flown higher, guarantees reception across the entire segment.

23. A — Tuning and identifying a navaid by its Morse code confirms the station is operating and transmitting the correct identifier. Navigating on an unverified or off-the-air station risks following an erroneous signal.

24. B — The CDI shows deviation relative to the selected OBS course, so setting a course opposite the direction of flight reverses the left/right sense. Setting the OBS to the course actually flown, or using an HSI, restores normal sensing.

25. A — Higher true airspeeds at altitude would enlarge the holding pattern beyond its 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 at altitude.

26. C — Radar vectors already align the aircraft with the final approach course, so the course-reversal purpose of a procedure turn is unnecessary. Flying one anyway could conflict with ATC's sequencing.

27. A — The glide slope antenna radiates additional lobes at higher angles, creating false glide slopes above the true path. Intercepting from below at the published altitude avoids capturing one of these false upper signals.

28. A — The MDA is the lowest altitude guaranteeing obstacle clearance 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 the MDA provides.

29. B — Categories use 1.3 × V_SO because it approximates a safe final approach speed, which determines the turn radius and the protected airspace around the procedure. Faster aircraft need larger protected areas, hence higher category minimums.

30. C — Circling requires the aircraft to maneuver visually at low altitude around the airport, demanding greater obstacle clearance than a straight-in path. The larger protected area and higher minimums reflect this maneuvering risk.

31. B — With continuous vertical guidance, the go/no-go decision is made precisely at the Decision Altitude, so the missed approach begins there. A non-precision approach, lacking vertical guidance, instead uses a missed approach point.

32. A — In a typical light aircraft the turn coordinator is electrically driven, independent of the vacuum system, so it survives a vacuum failure. This deliberate split in power sources is the foundation of partial-panel flying.

33. C — The magnetic compass is unreliable during the turn itself due to dip-induced errors, so timed turns at standard rate provide an accurate heading-change reference. Timing a known rate for a known duration yields a precise heading change.

34. D — 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.

35. C — "Get-there-itis" pressures pilots to continue into deteriorating conditions beyond safe limits to meet a goal or schedule. This external pressure has caused many accidents, countered by honoring preset personal minimums.

36. C — Regulations set a floor that does not account for an individual pilot's currency, fatigue, or the specific conditions, so a legal flight can still be unsafe. Personal minimums above the legal floor close this gap.

37. A — On a dark or IMC takeoff, forward acceleration produces a somatogravic illusion of pitching up, tempting a nose-down input toward the ground with no horizon to correct it. This makes it among the most lethal illusions on departure.

38. C — Cold, dense air lowers the actual height corresponding to 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."

39. D — 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, making the report essential even in radar contact.

40. D — In a glass cockpit, multiple displayed parameters can share a single ADC or AHRS, so one sensor failure may remove several indications at once. Independent backup instruments preserve essential data after such a failure.

41. B — In an established constant-airspeed climb, holding the target airspeed is the objective, so the airspeed indicator most directly shows pitch performance and is primary for pitch. If airspeed drifts, pitch is adjusted to restore it.

42. B — Procedures, waypoints, and altitudes change between database cycles, and outdated data can present incorrect or unsafe approach guidance. A current database is therefore required for IFR approaches that depend on it.

43. D — An ODP exists for obstacle clearance—a pilot responsibility—so it may be flown without specific assignment, while a SID serves ATC traffic management and is always assigned. Their differing purposes drive the difference in how they are used.

44. A — Directly over a VOR, the signal is transmitted in a cone within which the receiver cannot determine a usable radial, producing the "cone of confusion." Momentary flag or needle fluctuation overhead is normal as the aircraft passes through it.

45. C — A continuous stabilized descent keeps the aircraft on a predictable path and reduces the risk of controlled flight into terrain near stepdown fixes. A "dive and drive" with abrupt level-offs raises that risk.

46. D — Leading the level-off by about 10 percent of the vertical speed prevents overshooting the target altitude. At 500 fpm, beginning the level-off about 50 feet early lets the aircraft settle smoothly onto the altitude.

47. D — Freezing rain indicates a layer of warmer air aloft where precipitation formed as liquid, and it can produce rapid, dangerous clear-ice accumulation. Its presence signals the need to change altitude promptly to escape the icing.

48. A — The MEA guarantees both obstacle clearance and reliable navigation signal coverage along the segment. Defining such minimum altitudes ensures safe enroute IFR navigation.

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

50. D — A discrete transponder code lets ATC radar uniquely identify and track each IFR flight, which the generic 1200 cannot. Discrete codes are essential to radar separation and sequencing.

51. B — Each instrument exploits the gyroscopic property best suited to what it measures: rigidity for the fixed reference of the attitude and heading indicators, precession for the rate-driven turn coordinator. The design matches the property to the measurement.

52. C — ATC separates IFR traffic, so it assigns altitudes to maintain that separation, and the pilot flies the assigned altitude even when others would be legal for the course. The cruising-altitude rules apply chiefly when no altitude is assigned.

53. B — The magnetic compass works by a magnetized element aligning with Earth's magnetic field, requiring no engine or electrical power. This self-contained operation makes it the ultimate backup heading reference.

54. A — An instrument proficiency check verifies the pilot's instrument knowledge and skill before resuming IFR privileges after currency has lapsed beyond the grace period. The rating itself does not expire; the privilege to exercise it requires demonstrated proficiency.

55. A — The briefing strip is placed at the top of the chart to present the most critical information—frequency, course, key altitudes, and missed approach—for efficient briefing before the approach. This standardized layout lets the pilot prepare quickly.

56. C — A broken or overcast layer obscures enough sky to determine whether an approach can break out in time to land, so it constitutes a ceiling, while few or scattered layers do not. The ceiling definition reflects operational relevance to approaches.

57. B — 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.

58. C — Only actual or simulated instrument conditions exercise the skills the currency requirement is meant to preserve—flying solely by reference to instruments. Approaches flown in VMC without simulating instrument conditions do not build those skills.

59. C — On a back course, the CDI deflection is referenced to the front-course orientation, so flying the back course reverses the left/right sense without an HSI. An HSI slaves the display to heading, eliminating the reversal.

60. D — A single pilot must manage all resources—automation, ATC, weather, and personal attention—without the support of a crew. SRM provides the framework for doing so effectively under the high workload of IFR.