

# PRACTICE EXAM 34 (60 QUESTIONS)

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1. What is required to act as pilot in command under instrument flight rules or in instrument meteorological conditions?

- A. An instrument rating in the category of aircraft flown
- B. A commercial pilot certificate
- C. An airline transport pilot certificate
- D. A multi-engine rating

2. Which instrument is the only one that operates using ram (pitot) pressure?

- A. The altimeter
- B. The vertical speed indicator
- C. The heading indicator
- D. The airspeed indicator

3. A pilot computes the time to fly a 50 NM leg at a groundspeed of 120 knots. What is the time?

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

4. Which gyroscopic property drives the turn coordinator?

- A. Rigidity in space
- B. Precession

- C. Magnetic dip
- D. Centrifugal force

5. What does "high to low, look out below" describe?

- A. Descending below the minimum descent altitude
- B. Flying toward lower pressure without resetting the altimeter makes true altitude lower than indicated
- C. Transitioning from high to low airway minimums
- D. The VSI behavior in a temperature inversion

6. Instrument currency requires six approaches, holding, and intercepting and tracking courses within what period?

- A. The preceding 30 days
- B. The preceding 12 calendar months
- C. The preceding 6 calendar months
- D. The preceding 3 calendar months

7. In which class of airspace must all operations be conducted under IFR?

- A. Class B
- B. Class E
- C. Class A
- D. Class C

8. Within what period must a VOR equipment check be completed for IFR navigation?

- A. The preceding 24 calendar months
- B. The preceding 30 days

- C. The preceding 12 calendar months
- D. The preceding 6 calendar months

9. A pilot computes the descent rate to lose 3,000 feet over 10 NM at a groundspeed of 120 knots (2 NM/min). What rate is required?

- A. 500 feet per minute
- B. 1,000 feet per minute
- C. 750 feet per minute
- D. 600 feet per minute

10. What transponder code indicates a two-way radio communication failure?

- A. 7500
- B. 7700
- C. 1200
- D. 7600

11. Which AIRMET designation covers IFR conditions and mountain obscuration?

- A. Tango
- B. Zulu
- C. Sierra
- D. Yankee

12. What is the standard alternate minimum for an airport with only a non-precision approach?

- A. Ceiling 800 feet and visibility 2 statute miles
- B. Ceiling 600 feet and visibility 2 statute miles

- C. Ceiling 2,000 feet and visibility 3 statute miles
- D. Ceiling 400 feet and visibility 1 statute mile

13. A Decision Altitude is associated with which type of approach?

- A. A VOR non-precision approach
- B. An NDB approach
- C. A localizer-only approach
- D. A precision or vertically guided approach such as ILS or LPV

14. Which minimum altitude guarantees obstacle clearance but navigation signal reception only within 22 NM of the VOR?

- A. The minimum enroute altitude (MEA)
- B. The minimum obstruction clearance altitude (MOCA)
- C. The minimum reception altitude (MRA)
- D. The maximum authorized altitude (MAA)

15. What does DME measure?

- A. The slant-range distance to the station
- B. The ground distance to the station
- C. The bearing to the station
- D. The altitude above the station

16. A pilot computes the climb rate for a departure requiring 200 ft/NM at a groundspeed of 120 knots (2 NM/min). What rate is required?

- A. 400 feet per minute

- B. 450 feet per minute
- C. 540 feet per minute
- D. 600 feet per minute

17. What is the IFR fuel reserve required after reaching the destination and any required alternate?

- A. 30 minutes at normal cruising speed
- B. 60 minutes at holding speed
- C. 20 minutes at maximum endurance
- D. 45 minutes at normal cruising speed

18. What does WAAS enable that basic GPS cannot?

- A. Vertically guided approaches to LPV minimums
- B. Navigation without an onboard receiver
- C. Elimination of the navigation database
- D. Use only above 18,000 feet

19. The "1-2-3 rule" requires an alternate unless the destination forecast shows what for the window from 1 hour before to 1 hour after ETA?

- A. Ceiling at least 1,000 feet and visibility at least 3 statute miles
- B. Ceiling at least 3,000 feet and visibility at least 5 statute miles
- C. Ceiling at least 2,000 feet and visibility at least 3 statute miles
- D. Ceiling at least 1,500 feet and visibility at least 2 statute miles

20. A standard-rate turn is defined as how many degrees per second?

- A. 1.5 degrees per second

- B. 6 degrees per second
- C. 3 degrees per second
- D. 2 degrees per second

21. What does the "T" in the CRAFT clearance mnemonic represent?

- A. True airspeed
- B. The transponder (squawk) code
- C. Time of release
- D. Type of approach

22. A Minimum Descent Altitude is used on which type of approach?

- A. A non-precision approach
- B. A precision ILS approach
- C. An LPV approach
- D. An LNAV/VNAV approach

23. What is the standard inbound holding leg timing at or below 14,000 feet MSL?

- A. 1.5 minutes
- B. 2 minutes
- C. 1 minute
- D. 45 seconds

24. A pilot computes the wind correction angle with a 40-knot crosswind component and a true airspeed of 120 knots, using  $WCA \approx \text{crosswind} \div (\text{TAS} \div 60)$ . What is the WCA?

- A. 5 degrees

- B. 15 degrees
- C. 10 degrees
- D. 20 degrees

25. An Obstacle Departure Procedure (ODP) serves primarily what purpose?

- A. To manage air traffic flow in busy airspace
- B. To provide obstacle clearance for departing aircraft
- C. To provide a course reversal onto the approach
- D. To define the enroute cruising altitude

26. Which front typically produces widespread, layered clouds and steady precipitation over a large area ahead of it?

- A. A cold front
- B. An occluded front
- C. A warm front
- D. A dry line

27. A full-scale CDI deflection on a VOR represents approximately how many degrees of course error?

- A. 5 degrees
- B. 10 degrees
- C. 2 degrees
- D. 20 degrees

28. What does a "descend via" clearance on a STAR authorize?

- A. Immediate descent to the airport elevation

- B. Descent at pilot's discretion to comply with all charted crossing restrictions
- C. Maintaining the last assigned altitude indefinitely
- D. Disregarding all published altitude restrictions

29. What two conditions must exist simultaneously for structural icing to form?

- A. Visible moisture and a temperature at or below freezing
- B. Freezing temperatures and high pressure
- C. Supercooled droplets and turbulence
- D. A temperature inversion and high humidity

30. Around a Northern Hemisphere high-pressure system, surface wind flows in what manner?

- A. Clockwise and outward, with descending air and fair weather
- B. Counterclockwise and inward, with rising air
- C. Counterclockwise and outward, with stable air
- D. Clockwise and inward, with precipitation

31. A pilot computes the time from the FAF to the MAP. The distance is 4.5 NM and the groundspeed is 90 knots (1.5 NM/min). What is the time?

- A. 2 minutes
- B. 3 minutes
- C. 4 minutes
- D. 1.5 minutes

32. What is required to regain instrument privileges after currency has lapsed beyond the grace period?

- A. A flight review only

- B. Six approaches with an instructor
- C. A new written knowledge test
- D. An instrument proficiency check (IPC)

33. In a typical light aircraft, a vacuum failure disables which instruments?

- A. The attitude indicator and heading indicator
- B. The turn coordinator and airspeed indicator
- C. The altimeter and vertical speed indicator
- D. The magnetic compass and clock

34. A pilot loses two-way communication in VMC on an IFR flight plan. What is the correct action?

- A. Continue VFR and land as soon as practical
- B. Climb to the highest minimum IFR altitude
- C. Squawk 7700 and descend
- D. Hold at the present position

35. What is the standard climb gradient assumed for departure obstacle clearance unless a higher value is published?

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

36. Which AIRMET designation covers turbulence and strong surface winds?

- A. Sierra

- B. Zulu
- C. Tango
- D. Yankee

37. Which scan error involves staring at a single instrument while neglecting the others?

- A. Omission
- B. Emphasis
- C. Fixation
- D. Inversion

38. A pilot computes the magnetic bearing TO an NDB with a magnetic heading of  $200^\circ$  and a relative bearing of  $110^\circ$ . What is the bearing to the station?

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

39. Which line of minimums on an RNAV (GPS) approach provides the lowest minimums and requires WAAS?

- A. LNAV
- B. LP
- C. LPV
- D. Circling

40. What does an aft center-of-gravity condition do to longitudinal stability?

- A. It increases stability and raises stall speed
- B. It has no effect on stability
- C. It reduces stability, making unusual-attitude recovery more difficult
- D. It eliminates the need for trim

41. What is the minimum passing score on the FAA Instrument Rating – Airplane knowledge test?

- A. 75 percent
- B. 80 percent
- C. 65 percent
- D. 70 percent

42. A SID differs from an ODP primarily in what way?

- A. A SID is always assigned by ATC and serves traffic-flow management
- B. A SID provides only obstacle clearance
- C. A SID is flown only in VMC
- D. A SID applies only to turbine aircraft

43. At and above what altitude must all aircraft set the standard altimeter setting of 29.92 inches Hg?

- A. 18,000 feet MSL
- B. 14,500 feet MSL
- C. 24,000 feet MSL
- D. 10,000 feet MSL

44. How many satellites must a GPS receiver acquire for a three-dimensional position fix?

- A. Two
- B. Three
- C. Four
- D. Five

45. A pilot computes total fuel for an IFR flight: 2.0 hours to destination, 0.7 hours to alternate, plus the required reserve, at 12 gallons per hour. What minimum fuel is needed?

- A. 32.4 gallons
- B. 41.4 gallons
- C. 45.0 gallons
- D. 50.4 gallons

46. Which item is required for IFR flight under 14 CFR 91.205 but not for day VFR?

- A. An airspeed indicator
- B. A slip-skid indicator (inclinometer)
- C. A magnetic compass
- D. An altimeter

47. Which gyroscopic property allows the attitude indicator to maintain a stable horizon reference?

- A. Precession
- B. Magnetic dip
- C. Centrifugal force
- D. Rigidity in space

48. A standard Victor airway has what width?

- A. 8 nautical miles, 4 NM either side of centerline
- B. 10 nautical miles, 5 NM either side
- C. 4 nautical miles, 2 NM either side
- D. 16 nautical miles, 8 NM either side

49. Which report must be made to ATC at all times, even when in radar contact?

- A. Reaching a compulsory reporting point
- B. A revised estimate of three minutes
- C. A loss of navigation or communication capability
- D. Crossing the midpoint between two VORs

50. 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. Land immediately using the approach lights alone
- B. Descend to 100 feet above TDZE, and below only with the red terminating or side row bars in sight
- C. Execute a missed approach because lights never permit continuing
- D. Circle to another runway

51. The magnetic compass requires what to operate?

- A. An engine-driven vacuum pump
- B. The aircraft's electrical system
- C. The pitot-static system
- D. No external power; it aligns with Earth's magnetic field

52. A pilot computes the descent gradient to lose 4,000 feet over 20 NM. What gradient is required?

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

53. A holding pattern in lieu of a procedure turn is abbreviated how on approach charts?

- A. NoPT
- B. HILPT
- C. EFC
- D. VDP

54. What is the immediate transponder action upon a two-way communication failure?

- A. Squawk 1200 and continue
- B. Squawk 7600 and attempt to restore communication
- C. Squawk 7700 and descend
- D. Squawk 0000 to indicate IFR

55. Which instrument category in the control and performance method includes the attitude indicator and power indicator?

- A. Performance instruments
- B. Navigation instruments
- C. Supporting instruments
- D. Control instruments

56. A pilot recovering from a nose-low unusual attitude on partial panel should take which sequence?

- A. Raise the nose, reduce power, level the wings
- B. Add power, raise the nose, level the wings
- C. Level the wings with the attitude indicator, add power
- D. Reduce power, level the wings with the turn coordinator, then smoothly raise the nose

57. A pilot flying partial panel must change heading by 90 degrees. Using a timed turn at standard rate, how long should the turn be held?

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

58. On a precision ILS approach, where does the missed approach begin?

- 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

59. A pilot computes groundspeed with a true airspeed of 150 knots and a 30-knot tailwind, then the time for a 60 NM leg. What is the groundspeed and time?

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

60. A pilot flying single-pilot IFR engages the autopilot and FMS to manage workload. 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

### + Answer Key

1. A — An instrument rating in the category of aircraft flown is required to act as PIC under IFR or in IMC. The rating, not a higher certificate or class rating, is what legally authorizes IFR operation.
2. D — The airspeed indicator is the only instrument that operates using ram (pitot) pressure, comparing it against static pressure. The altimeter and VSI use static pressure alone.
3. D — At 120 knots groundspeed, 50 NM takes  $50 \div 120 \times 60 = 25$  minutes. Time over the ground is distance divided by groundspeed.
4. B — Precession drives the turn coordinator, translating the rate of turn into a proportional deflection. Rigidity in space, by contrast, drives the attitude and heading indicators.
5. B — Flying toward lower pressure without resetting the altimeter leaves true altitude lower than indicated, hence "look out below." The aneroid altimeter cannot sense the pressure change.
6. C — Instrument currency requires six approaches, holding, and intercepting and tracking courses within the preceding 6 calendar months. This is the baseline recency for instrument privileges.
7. C — Class A airspace (18,000 feet MSL through FL600) is IFR-only; all operations there must be under IFR with an appropriate clearance. No VFR is permitted.
8. B — A VOR equipment check for IFR navigation must be completed within the preceding 30 days, with the date, place, bearing error, and signature recorded. It is counted in actual days.

9. D — The descent is 3,000 feet over 10 NM; at 2 NM/min the 10 NM takes 5 minutes, so  $3,000 \div 5 = 600$  feet per minute. Matching descent rate to distance and groundspeed achieves the loss.

10. D — A two-way radio communication failure is indicated by squawking 7600. (7500 is hijacking, 7700 a general emergency.) The code alerts ATC to protect airspace for the lost-comm aircraft.

11. C — AIRMET Sierra covers IFR conditions and mountain obscuration. Tango covers turbulence and Zulu covers icing.

12. A — The standard alternate minimums for an airport with only a non-precision approach are an 800-foot ceiling and 2 statute miles visibility ("800-2"). A precision approach lowers this to 600-2.

13. D — A Decision Altitude is associated with a precision or vertically guided approach such as an ILS or LPV. Non-precision approaches (VOR, LOC, NDB) use a Minimum Descent Altitude.

14. B — The minimum obstruction clearance altitude (MOCA) guarantees obstacle clearance but navigation signal reception only within 22 NM of the VOR. The MEA, by contrast, guarantees reception for the whole segment.

15. A — DME measures the slant-range (straight-line) distance to the station, not the ground distance. The error is greatest close to the station at high altitude.

16. A — At 120 knots (2 NM/min), a 200 ft/NM gradient requires  $200 \times 2 = 400$  feet per minute. The gradient is multiplied by groundspeed in nautical miles per minute.

17. D — The IFR fuel reserve after destination and any required alternate is 45 minutes at normal cruising speed. This exceeds the 30-minute VFR day reserve.

18. A — WAAS augments GPS with corrections and integrity monitoring, enabling vertically guided approaches to LPV minimums. Basic GPS lacks the integrity needed for vertical guidance.

19. C — The 1-2-3 rule requires an alternate unless the destination forecast shows at least a 2,000-foot ceiling and 3 statute miles visibility for the window. Both conditions must be met to skip the alternate.

20. C — A standard-rate turn is 3 degrees per second, completing a 360° turn in two minutes. It is the benchmark for instrument maneuvering and timed turns.

21. B — In the CRAFT mnemonic, "T" is the transponder (squawk) code. The full sequence is Clearance limit, Route, Altitude, Frequency, Transponder.

22. A — A Minimum Descent Altitude is used on a non-precision approach, which provides lateral guidance only. Precision and vertically guided approaches use a Decision Altitude.

23. C — Standard inbound holding leg timing at or below 14,000 feet MSL is 1 minute. Above 14,000 feet it increases to 1.5 minutes.

24. D —  $WCA \approx \text{crosswind} \div (\text{TAS} \div 60) = 40 \div (120 \div 60) = 40 \div 2 = 20$  degrees. The rule estimates the crab angle needed against the crosswind component.

25. B — An Obstacle Departure Procedure exists primarily to provide obstacle clearance for departing aircraft and may be flown without specific ATC assignment. A SID, by contrast, manages traffic flow and is always assigned.

26. C — A warm front typically produces widespread, layered (stratiform) clouds and steady precipitation over a large area ahead of it. The gentle lifting of stable air creates this broad, prolonged weather.

27. B — A full-scale CDI deflection on a VOR represents approximately 10 degrees of course error. This coarse sensitivity contrasts with the much more sensitive localizer.

28. B — A "descend via" clearance authorizes the pilot to descend at pilot's discretion while complying with all charted crossing restrictions on the STAR. Without it, the pilot maintains the last assigned altitude.

29. A — Structural icing requires visible moisture and a temperature at or below freezing at the airframe, simultaneously. Removing either ingredient stops accumulation.

30. A — Around a Northern Hemisphere high, surface wind flows clockwise and outward, with descending air and generally fair weather. A low, by contrast, has counterclockwise, inward flow with rising air.

31. B — At 90 knots (1.5 NM/min), 4.5 NM takes  $4.5 \div 1.5 = 3$  minutes to the MAP. Timing from the FAF identifies the MAP when no fix or waypoint defines it.

32. D — After currency has lapsed beyond the grace period, an instrument proficiency check (IPC) is required to regain instrument privileges. The pilot can no longer self-certify beyond that window.

33. A — In a typical light aircraft, a vacuum failure disables the vacuum-driven attitude and heading indicators. The electric turn coordinator, plus the airspeed indicator, altimeter, VSI, and compass, remain.

34. A — On losing communication in VMC, the pilot continues VFR and lands as soon as practical. The full 91.185 route-and-altitude rules apply only if the flight remains in IMC.

35. B — The standard departure climb gradient assumed for obstacle clearance is 200 feet per nautical mile unless a higher value is published. Departures also assume a climb to 400 feet above the runway end before turning.

36. C — AIRMET Tango covers turbulence and strong surface winds. Sierra covers IFR/mountain obscuration and Zulu covers icing.

37. C — Fixation is the scan error of staring at a single instrument while neglecting the others. It destroys the integrated cross-check and can allow an undetected problem to develop.

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

39. C — LPV typically provides the lowest minimums on an RNAV (GPS) chart, approaching ILS precision, and requires WAAS. LNAV and LP are lateral-only with higher minimums.

40. C — An aft CG reduces longitudinal stability, making recovery from a stall or unusual attitude more difficult—especially hazardous in IMC. A forward CG increases stability but raises stall speed.

41. D — The minimum passing score on the IRA knowledge test is 70 percent (42 of 60 correct). This is the standard FAA airman knowledge test threshold.

42. A — A SID is always assigned by ATC and serves traffic-flow management, though it may also provide obstacle clearance. An ODP, by contrast, exists for obstacle clearance and may be flown without assignment.

43. A — At and above 18,000 feet MSL (Class A), all aircraft set the standard altimeter setting of 29.92 inches Hg. This places all high-altitude traffic on common pressure altitude/flight levels.

44. C — A GPS receiver needs at least four satellites to compute a three-dimensional position fix. RAIM fault detection then requires a fifth (or four plus baro-aiding).

45. B — Fuel = 2.0 hr + 0.7 hr + 0.75 hr reserve = 3.45 hr × 12 gph = 41.4 gallons. The 45-minute IFR reserve is added after destination and alternate before applying the burn rate.

46. B — The slip-skid indicator (inclinometer/ball) is required for IFR under 91.205 but not for day VFR. The airspeed indicator, magnetic compass, and altimeter are all required for day VFR as well.

47. D — Rigidity in space keeps the attitude indicator's gyro fixed in its plane of rotation, providing the stable horizon reference. Precession, by contrast, drives the turn coordinator.

48. A — A standard Victor airway is 8 nautical miles wide—4 NM either side of the centerline. Tracking the centerline keeps the aircraft within this protected airspace.

49. C — A loss of navigation or communication capability must be reported to ATC at all times, even in radar contact. Reporting-point crossings and revised estimates apply only outside radar contact.

50. B — 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.

51. D — The magnetic compass requires no external power; it operates by a magnetized element aligning with Earth's magnetic field. This self-contained operation makes it the ultimate backup heading reference.

52. A — The gradient is 4,000 feet over 20 NM =  $4,000 \div 20 = 200$  feet per NM. Descent gradient equals altitude loss divided by distance.

53. B — A holding pattern in lieu of a procedure turn is abbreviated HILPT on approach charts. It uses a charted holding pattern to accomplish the course reversal.

54. B — The immediate action on a two-way communication failure is to squawk 7600 and attempt to restore communication. Troubleshooting may resolve the problem before further procedures are needed.

55. D — In the control and performance method, the control instruments include the attitude indicator and power indicator, which the pilot directly commands. The performance instruments reflect the resulting state.

56. D — 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.

57. A — A 90° heading change at standard rate (3°/sec) takes  $90 \div 3 = 30$  seconds. Timed turns substitute for the failed heading indicator.

58. D — On a precision ILS approach, 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.

59. C — Groundspeed =  $150 + 30 = 180$  knots; 60 NM at 180 knots takes  $60 \div 180 \times 60 = 20$  minutes. The tailwind adds to true airspeed to yield groundspeed.

60. C — Engaging the autopilot and FMS 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.