PRACTICE EXAM 31 (60 QUESTIONS)

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

A. A commercial pilot certificate

B. A type rating for the aircraft

C. An instrument rating in the category of aircraft flown

D. A second-class medical certificate

2. Which instrument operates using ram (pitot) pressure?

A. The altimeter

B. The vertical speed indicator

C. The airspeed indicator

D. The heading indicator

3. A pilot computes the time to fly a 50 NM leg at a groundspeed of 150 knots. What is the time?

A. 15 minutes

B. 20 minutes

C. 25 minutes

D. 30 minutes

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

A. The preceding 24 calendar months

B. The preceding 12 calendar months

C. The preceding 30 days

D. The preceding 6 calendar months

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

A. Precession

B. Magnetic dip

C. Rigidity in space

D. Centrifugal force

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 3 calendar months

D. The preceding 6 calendar months

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

A. Class B

B. Class E

C. Class C

D. Class A

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

A. 7500

B. 7600

C. 7700

D. 1200

9. A pilot computes the descent rate to lose 4,000 feet over 16 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 does "high to low, look out below" describe?

A. Flying toward lower pressure without resetting the altimeter makes true altitude lower than indicated

B. Descending below the minimum descent altitude

C. Transitioning from high to low airway minimums

D. The VSI behavior in a temperature inversion

11. Which AIRMET designation covers icing and freezing levels?

A. Sierra

B. Zulu

C. Tango

D. Yankee

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

A. 3 degrees per second

B. 1.5 degrees per second

C. 6 degrees per second

D. 2 degrees per second

13. 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

14. What is the standard alternate minimum for an airport with a 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

15. Which minimum altitude guarantees both obstacle clearance and navigation signal reception along the entire segment?

A. The minimum enroute altitude (MEA)

B. The minimum obstruction clearance altitude (MOCA)

C. The minimum reception altitude (MRA)

D. The minimum crossing altitude (MCA)

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

A. A precision or vertically guided approach such as ILS or LPV

B. A VOR non-precision approach

C. A localizer-only approach

D. An NDB approach

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 DME measure?

A. The ground distance to the station

B. The bearing to the station

C. The altitude above the station

D. The slant-range distance to the station

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

A. Three

B. Four

C. Five

D. Two

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

A. 5 degrees

B. 15 degrees

C. 10 degrees

D. 20 degrees

21. 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 2,000 feet and visibility at least 3 statute miles

B. Ceiling at least 1,000 feet and visibility at least 3 statute miles

C. Ceiling at least 3,000 feet and visibility at least 5 statute miles

D. Ceiling at least 1,500 feet and visibility at least 2 statute miles

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

A. The transponder (squawk) code

B. True airspeed

C. Time of release

D. Type of approach

23. Which gyroscopic property drives the turn coordinator?

A. Rigidity in space

B. Precession

C. Magnetic dip

D. Centrifugal force

24. 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

25. A standard Victor airway has what width?

A. 4 nautical miles, 2 NM either side

B. 10 nautical miles, 5 NM either side

C. 8 nautical miles, 4 NM either side

D. 16 nautical miles, 8 NM either side

26. A pilot computes the time from the FAF to the MAP. The distance is 6 NM and the groundspeed is 120 knots (2 NM/min). What is the time?

A. 2 minutes

B. 3 minutes

C. 4 minutes

D. 1.5 minutes

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

A. Omission

B. Emphasis

C. Fixation

D. Inversion

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

A. A precision ILS approach

B. An LPV approach

C. An LNAV/VNAV approach

D. A non-precision approach

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

A. 1.5 minutes

B. 1 minute

C. 2 minutes

D. 45 seconds

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

A. Clockwise and outward, with descending air

B. Clockwise and inward, with stable air

C. Counterclockwise and inward, with rising air

D. Straight along the isobars with no rotation

31. 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

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

A. 150 feet per nautical mile

B. 250 feet per nautical mile

C. 200 feet per nautical mile

D. 300 feet per nautical mile

33. A pilot computes the magnetic bearing TO an NDB with a magnetic heading of 030° and a relative bearing of 045°. What is the bearing to the station?

A. 110 degrees

B. 075 degrees

C. 165 degrees

D. 045 degrees

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

A. 75 percent

B. 80 percent

C. 70 percent

D. 65 percent

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

A. To provide obstacle clearance for departing aircraft

B. To manage air traffic flow in busy airspace

C. To provide a course reversal onto the approach

D. To define the enroute cruising altitude

36. Which front typically produces a narrow band of intense weather with rapid clearing behind it?

A. A warm front

B. A stationary front

C. An occluded front

D. A cold front

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

A. Freezing temperatures and high pressure

B. Visible moisture and a temperature at or below freezing

C. Supercooled droplets and turbulence

D. A temperature inversion and high humidity

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

A. 5 degrees

B. 2 degrees

C. 20 degrees

D. 10 degrees

39. A "descend via" clearance on a STAR authorizes the pilot to do what?

A. Descend immediately to the airport elevation

B. Maintain the last assigned altitude until further descent

C. Descend at pilot's discretion to comply with all charted crossing restrictions

D. Disregard all published altitude restrictions

40. 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

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

A. Tango

B. Zulu

C. Yankee

D. Sierra

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

A. A slip-skid indicator (inclinometer)

B. An airspeed indicator

C. A magnetic compass

D. An altimeter

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

A. 14,500 feet MSL

B. 18,000 feet MSL

C. 24,000 feet MSL

D. 10,000 feet MSL

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

A. A SID provides only obstacle clearance

B. A SID is always assigned by ATC and serves traffic-flow management

C. A SID is flown only in VMC

D. A SID applies only to turbine aircraft

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

A. LNAV

B. LP

C. Circling

D. LPV

46. 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)

47. 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

48. The magnetic compass requires what to operate?

A. No external power; it aligns with Earth's magnetic field

B. An engine-driven vacuum pump

C. The aircraft's electrical system

D. The pitot-static system

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. Crossing the midpoint between two VORs

D. A missed approach

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

A. The turn coordinator and airspeed indicator

B. The attitude indicator and heading indicator

C. The altimeter and vertical speed indicator

D. The magnetic compass and clock

51. 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. Execute a missed approach because lights never permit continuing

C. Circle to another runway

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

52. A pilot computes the descent gradient to lose 3,000 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. What does an aft center-of-gravity condition do to longitudinal stability?

A. It reduces stability, making unusual-attitude recovery more difficult

B. It increases stability and raises stall speed

C. It has no effect on stability

D. It eliminates the need for trim

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

A. Performance instruments

B. Navigation instruments

C. Control instruments

D. Supporting instruments

55. 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

56. 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

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

A. NoPT

B. EFC

C. HILPT

D. VDP

58. 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

59. A pilot computes total fuel for an IFR flight with no alternate required: 2.5 hours to destination, plus the required reserve, at 12 gallons per hour. What minimum fuel is needed?

A. 30.0 gallons

B. 33.0 gallons

C. 36.0 gallons

D. 39.0 gallons

60. A pilot flying single-pilot IFR engages the autopilot 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 avoid programming the FMS in terminal airspace

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

+ Answer Key

1. C — An instrument rating in the category of aircraft flown is required to act as PIC under IFR or in IMC. The rating, not a commercial certificate or type rating, is what legally authorizes IFR operation.

2. C — 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. B — At 150 knots groundspeed, 50 NM takes 50 ÷ 150 × 60 = 20 minutes. Time over the ground is distance divided by groundspeed.

4. C — 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.

5. C — 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.

6. D — 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. D — 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 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.

9. A — The descent is 4,000 feet over 16 NM; at 2 NM/min the 16 NM takes 8 minutes, so 4,000 ÷ 8 = 500 feet per minute. Matching descent rate to distance and groundspeed achieves the loss.

10. A — 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.

11. B — AIRMET Zulu covers icing and freezing levels. Sierra covers IFR/mountain obscuration and Tango covers turbulence.

12. A — 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.

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

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

15. A — The minimum enroute altitude (MEA) guarantees both obstacle clearance and acceptable navigation reception along the entire segment. The MOCA guarantees obstacle clearance but reception only within 22 NM of the VOR.

16. A — A Decision Altitude is associated with a precision or vertically guided approach such as an ILS or LPV. Non-precision approaches use a Minimum Descent Altitude.

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. D — 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.

19. B — 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).

20. C — WCA ≈ crosswind ÷ (TAS ÷ 60) = 20 ÷ (120 ÷ 60) = 20 ÷ 2 = 10 degrees. The rule estimates the crab angle for the crosswind component.

21. A — 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.

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

23. B — Precession drives the turn coordinator, translating the rate of turn into a proportional deflection. Rigidity in space drives the attitude and heading indicators.

24. 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.

25. C — 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.

26. B — At 120 knots (2 NM/min), 6 NM takes 6 ÷ 2 = 3 minutes to the MAP. Timing from the FAF identifies the MAP when no fix or waypoint defines it.

27. 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.

28. D — 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.

29. B — 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.

30. C — Around a Northern Hemisphere low, surface wind flows counterclockwise and inward, lifting air and producing clouds and precipitation. A high has clockwise, outward flow with descending air.

31. 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.

32. C — 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.

33. B — Magnetic bearing TO the station = magnetic heading + relative bearing = 030° + 045° = 075°. The ADF relative bearing is added to heading to obtain the magnetic bearing to the station.

34. C — 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.

35. A — 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.

36. D — A cold front produces a narrow band of intense weather—cumuliform clouds, showers, possible thunderstorms—with rapid clearing behind it. The steep frontal slope concentrates the weather, unlike the broad layered weather of a warm front.

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

38. D — 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.

39. C — 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.

40. 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.

41. D — AIRMET Sierra covers IFR conditions and mountain obscuration. Tango covers turbulence and Zulu covers icing.

42. A — 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.

43. B — 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. B — 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.

45. D — 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.

46. 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.

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

48. A — 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.

49. D — A missed approach 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 — 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.

51. D — 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.

52. C — The gradient is 3,000 feet over 20 NM = 3,000 ÷ 20 = 150 feet per NM. Descent gradient equals altitude loss divided by distance.

53. A — 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.

54. C — 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.

55. 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.

56. C — Groundspeed = 150 + 30 = 180 knots; 60 NM at 180 knots takes 60 ÷ 180 × 60 = 20 minutes. The tailwind adds to true airspeed to yield groundspeed.

57. C — 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.

58. 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.

59. D — With no alternate required, fuel = 2.5 hr + 0.75 hr reserve = 3.25 hr × 12 gph = 39.0 gallons. The 45-minute IFR reserve is added to the time enroute before applying the burn rate.

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