PRACTICE EXAM 33 SIMULATION

1. An aircraft crosses the FAF at 2,700 feet MSL and must descend to an MDA of 740 feet over a 4.0 NM final at a groundspeed of 120 knots. The approximate descent rate required is:

A. About 500 fpm

B. About 980 fpm

C. About 650 fpm

D. About 1,200 fpm

2. A pilot holds east of a fix on the 090 radial, standard pattern, arriving inbound on a heading of 270. The wind is from 360 at 30 knots. To hold the inbound track, the pilot must apply a wind correction on the outbound leg that is:

A. Tripled relative to the inbound correction, and timed to roll out on the inbound course

B. Equal and opposite only

C. Ignored on the outbound leg

D. Applied only on the inbound leg

3. An aircraft at 150 knots true airspeed in a standard-rate turn requires a bank angle of approximately (rule of thumb: TAS/10 + 7):

A. About 15 degrees

B. About 22 degrees

C. About 30 degrees

D. About 40 degrees

4. A pilot computes that to descend 6,000 feet while covering 20 NM at a groundspeed of 150 knots, the required descent rate is approximately:

A. About 500 fpm

B. About 750 fpm

C. About 1,000 fpm

D. About 1,250 fpm

5. A pilot is cleared to cross a fix 30 NM ahead at 11,000 feet, currently at 17,000 feet and 150 knots groundspeed. To plan a 3-degree descent (≈300 ft/NM equivalent here at 6,000 feet over 20 NM), the descent should begin approximately:

A. At the fix

B. 30 NM before the fix

C. 20 NM before the fix

D. 10 NM before the fix

6. A pilot enters a hold at a fix with the inbound course of 270 while arriving on a heading of 350 (standard right turns). The correct entry is:

A. Direct

B. Parallel

C. Teardrop

D. No entry needed

7. A pilot flying a DME arc 12 NM from the station notes the bearing changes; to remain on the arc with a slight wind pushing outward, the pilot should:

A. Turn away from the station

B. Turn slightly toward the station to tighten the arc

C. Maintain heading

D. Descend

8. A pilot computes that with a true airspeed of 160 knots and a direct headwind of 25 knots, the groundspeed on final is 135 knots; the time to fly a 4.5 NM final is approximately:

A. About 2 minutes

B. About 3 minutes

C. About 4 minutes

D. About 1 minute

9. An aircraft must lose 4,500 feet and is 15 NM from the airport at 180 knots groundspeed (3 NM per minute, 5 minutes available). The minimum average descent rate is:

A. About 600 fpm

B. About 750 fpm

C. About 800 fpm

D. About 900 fpm

10. A pilot calculates fuel for a flight requiring 1.8 hours to the destination, 0.6 hours to the alternate, plus the 45-minute IFR reserve, at a burn of 10 gallons per hour. The minimum fuel is approximately:

A. About 21 gallons

B. About 31.5 gallons

C. About 24 gallons

D. About 18 gallons

11. A pilot crossing a step-down fix at 3,200 feet must descend to an MDA of 1,100 feet within 2.3 NM at 90 knots groundspeed (1.5 NM per minute). The required descent rate is approximately:

A. About 900 fpm

B. About 1,100 fpm

C. About 1,370 fpm

D. About 1,600 fpm

12. A pilot determines that a 10-knot direct crosswind on a final approach course requires a crab angle, at 100 knots, of approximately (sine small-angle, crosswind/TAS in radians × 60):

A. About 2 degrees

B. About 4 degrees

C. About 8 degrees

D. About 6 degrees

13. A pilot at FL180 must descend to cross a fix at 8,000 feet, 40 NM away, at 240 knots groundspeed (4 NM per minute, 10 minutes). The required descent rate is approximately:

A. About 800 fpm

B. About 1,000 fpm

C. About 1,200 fpm

D. About 1,500 fpm

14. A pilot flying a procedure turn must remain within the charted distance (commonly 10 NM); at 120 knots groundspeed, the maximum time outbound before turning, allowing time to complete the reversal, is best managed by:

A. Flying the full 10 NM outbound

B. Limiting the outbound leg (commonly about 1 minute) before commencing the turn

C. Ignoring the distance

D. Turning immediately at the fix

15. A pilot computes that climbing at 500 fpm with a groundspeed of 90 knots (1.5 NM per minute) yields a climb gradient of approximately:

A. About 333 ft/NM

B. About 500 ft/NM

C. About 200 ft/NM

D. About 750 ft/NM

16. A departure requires a climb gradient of 350 ft/NM to 4,000 feet; at a groundspeed of 120 knots (2 NM per minute), the required rate of climb is:

A. About 350 fpm

B. About 500 fpm

C. About 600 fpm

D. About 700 fpm

17. A pilot must determine the time to a VOR station: the bearing changes 10 degrees in 1.5 minutes. Using the time-to-station formula (time = 60 × minutes / degrees of bearing change):

A. About 6 minutes

B. About 9 minutes

C. About 12 minutes

D. About 15 minutes

18. A pilot whose attitude indicator has failed must perform a timed compass turn from 030 to 210 (180 degrees) at standard rate, requiring:

A. 30 seconds

B. 45 seconds

C. 1 minute

D. 2 minutes

19. A pilot recognizes that rolling out of a turn to the north using the magnetic compass requires leading the rollout because the compass:

A. Lags on northerly headings

B. Is accurate on north

C. Overshoots on north

D. Undershoots when turning to north

20. A pilot computes that, to fly a 3-degree glidepath at 140 knots groundspeed, the required descent rate is approximately (groundspeed × 5):

A. About 500 fpm

B. About 600 fpm

C. About 650 fpm

D. About 700 fpm

21. A pilot is assigned to cross a fix at 6,000 feet and "expect" 4,000 feet beyond it, with the segment MEA of 5,000 feet, then loses communications before the fix. Crossing the fix, the pilot should be at:

A. 6,000 feet

B. 5,000 feet

C. 4,000 feet

D. The lowest of the three

22. A pilot calculates that with a 60-knot headwind component at FL200 and a TAS of 300 knots, the groundspeed is 240 knots; covering 120 NM takes:

A. About 24 minutes

B. About 40 minutes

C. About 30 minutes

D. About 20 minutes

23. A pilot must determine whether an alternate is required: the destination forecast is exactly 2,000 feet ceiling and exactly 3 SM visibility at the ETA. Under the 1-2-3 rule:

A. No alternate is required (the values meet the threshold)

B. An alternate is required

C. The flight is prohibited

D. VFR must be used

24. A pilot flying an LPV approach with a DA of 250 feet and a TDZE of 50 feet has a height above touchdown of:

A. 300 feet

B. 250 feet

C. 50 feet

D. 200 feet

25. A pilot computes that a teardrop entry to a hold uses an outbound teardrop leg offset from the reciprocal of the inbound course by approximately:

A. 45 degrees on the non-holding side

B. 30 degrees on the holding side

C. 90 degrees on the holding side

D. 30 degrees on the non-holding side

26. A pilot must intercept the 360 radial inbound (course 180) from a position east of it; setting the OBS to 180 and turning to a 45-degree intercept, the heading would be approximately:

A. 180

B. 225

C. 135

D. 270

27. A pilot must hold at 5,000 feet MSL; the maximum holding airspeed there (USA) is:

A. 175 knots

B. 230 knots

C. 200 knots

D. 265 knots

28. A pilot at 9,500 feet in a non-pressurized aircraft for 45 minutes must, per the oxygen rules, recognize that supplemental oxygen for the crew is required above:

A. 10,000 feet for the whole time

B. 14,000 feet always

C. 15,000 feet always

D. 12,500 feet after 30 minutes

29. A pilot computes the descent point to arrive at pattern altitude: needing to lose 3,500 feet at 700 fpm (5 minutes) with a groundspeed of 120 knots (2 NM per minute), the descent should begin:

A. 10 NM out

B. 7 NM out

C. 5 NM out

D. 14 NM out

30. A pilot flying a holding pattern with a 20-knot tailwind on the outbound leg should adjust the outbound timing by:

A. Lengthening the outbound leg

B. Ignoring it

C. Maintaining 1 minute regardless

D. Shortening the outbound leg so the inbound leg is correct

31. A pilot computes that an aircraft descending at 800 fpm with a groundspeed of 120 knots (2 NM per minute) achieves a descent gradient of:

A. About 200 ft/NM

B. About 300 ft/NM

C. About 400 ft/NM

D. About 500 ft/NM

32. A pilot must determine the VDP (visual descent point) on a non-precision approach with an MDA 400 feet above TDZE and a 3-degree path; the VDP is approximately (HAT/300):

A. 0.5 NM from the threshold

B. 0.8 NM from the threshold

C. 1.0 NM from the threshold

D. 1.3 NM from the threshold

33. A pilot at the MDA on a non-precision approach reaches the computed VDP without the runway in sight. The pilot should:

A. Continue at the MDA to the MAP, then go missed if still not visual

B. Descend immediately

C. Execute the missed approach at the VDP

D. Circle at the VDP

34. A pilot flies a 4.5-degree glidepath (steeper than the standard 3 degrees) at a groundspeed of 130 knots. Using the groundspeed × 5 rule scaled for the steeper angle, the required descent rate is approximately:

A. About 600 fpm

B. About 800 fpm

C. About 975 fpm

D. About 1,200 fpm

35. A pilot computes the time to lose 2,800 feet at 700 fpm:

A. About 3 minutes

B. About 4 minutes

C. About 5 minutes

D. About 6 minutes

36. A pilot must cross a fix at or above 7,000 and another fix 8 NM later at or above 5,000, descending in between at 150 knots groundspeed (2.5 NM per minute, about 3.2 minutes). The minimum average rate to make the second crossing is approximately:

A. About 400 fpm

B. About 500 fpm

C. About 625 fpm

D. About 750 fpm

37. A pilot recognizing that the compass shows acceleration error on an easterly heading should understand that, on acceleration, the compass indicates a turn toward:

A. South

B. East

C. North

D. West

38. A pilot computes that an aircraft at 120 knots covers 1 NM in:

A. 30 seconds

B. 60 seconds

C. 45 seconds

D. 20 seconds

39. A pilot must determine the lead point for a turn onto an arc or course; at higher groundspeed, the lead distance:

A. Increases

B. Decreases

C. Stays constant

D. Becomes zero

40. A pilot flying a missed approach is told to "climb to 3,000, then as published." Reaching 3,000 feet still in the climb segment, the pilot should:

A. Level immediately and hold

B. Descend back

C. Stop the missed approach

D. Continue per the published missed approach track and altitude

41. A pilot computes that with a 15-knot quartering tailwind at 45 degrees off the tail, the tailwind component is approximately (cos 45 $\approx$ 0.7):

A. About 15 knots

B. About 10.5 knots

C. About 5 knots

D. About 0 knots

42. A pilot determines that the difference between indicated and true altitude grows when the air is:

A. Warmer than standard (true higher than indicated)

B. At standard temperature

C. Pressurized

D. Colder than standard (true lower than indicated)

43. A pilot flying in air colder than standard must recognize that the true altitude is:

A. Higher than indicated

B. Equal to indicated

C. Unaffected

D. Lower than indicated, a terrain hazard

44. A pilot computes a required climb gradient of 250 ft/NM; at 90 knots groundspeed (1.5 NM per minute), the rate of climb needed is:

A. About 250 fpm

B. About 300 fpm

C. About 375 fpm

D. About 500 fpm

45. A pilot must hold at 16,000 feet MSL; the maximum holding speed there is:

A. 230 knots

B. 265 knots

C. 200 knots

D. 175 knots

46. A pilot flying a parallel entry to a hold turns outbound on the holding side's reciprocal, then turns to:

A. The non-holding side to intercept the inbound course

B. Intercept the inbound course on the holding side, turning toward the fix

C. The fix directly

D. A 90-degree heading

47. A pilot computes that to make good a course with a 20-knot direct crosswind at a TAS of 120 knots, the wind correction angle is approximately (arcsin 20/120 ≈ 9.6 degrees):

A. About 10 degrees

B. About 5 degrees

C. About 15 degrees

D. About 20 degrees

48. A pilot at the FAF inbound at 100 knots groundspeed (1.67 NM per minute) flying a 5 NM final reaches the MAP in approximately:

A. About 5 minutes

B. About 4 minutes

C. About 2 minutes

D. About 3 minutes

49. A pilot must determine if the aircraft can meet a crossing restriction: 4,000 feet to lose in 8 NM at 120 knots (2 NM per minute, 4 minutes). The required descent rate is:

A. About 1,000 fpm

B. About 800 fpm

C. About 600 fpm

D. About 1,200 fpm

50. A pilot flying an approach computes the descent gradient from FAF to MAP: 1,800 feet over 6 NM equals:

A. About 300 ft/NM

B. About 200 ft/NM

C. About 400 ft/NM

D. About 500 ft/NM

51. A pilot must recognize that a "VDP" is not applicable to a circling approach because circling:

A. Uses a glide slope

B. Has no MAP

C. Requires no descent

D. Involves maneuvering rather than a straight-in descent path

52. A pilot computes that with a groundspeed of 180 knots, 1 NM is covered in:

A. 30 seconds

B. 20 seconds

C. 60 seconds

D. 15 seconds

53. A pilot flying a hold with a 1.5-minute inbound leg requirement (above 14,000 feet) must adjust the outbound leg to achieve the inbound timing, beginning by flying the outbound leg for approximately:

A. 1.5 minutes, then adjusting for wind

B. 1 minute always

C. 30 seconds

D. 2 minutes always

54. A pilot determines the descent rate for a 3-degree path at 90 knots groundspeed (groundspeed × 5):

A. About 600 fpm

B. About 300 fpm

C. About 500 fpm

D. About 450 fpm

55. A pilot recognizes that on a non-precision approach flown with the CDFA technique, the descent is continuous and the pilot treats the MDA effectively as a:

A. Glide slope intercept

B. Decision altitude (initiating a go-around at or near it if not visual)

C. Circling altitude

D. Step-down fix

56. A pilot computes that a tailwind on final increases the groundspeed, which for a fixed glidepath angle:

A. Decreases the required descent rate

B. Has no effect on descent rate

C. Increases the required descent rate

D. Eliminates the glidepath

57. A pilot must lose 5,000 feet at a maximum of 1,000 fpm; the minimum time required is:

A. 5 minutes

B. 4 minutes

C. 6 minutes

D. 3 minutes

58. A pilot determines that flying a steeper-than-standard glidepath at the same groundspeed requires:

A. A higher descent rate

B. A lower descent rate

C. The same descent rate

D. No descent

59. A pilot computes the groundspeed from a 6 NM segment flown in 3 minutes:

A. 90 knots

B. 100 knots

C. 120 knots

D. 150 knots

60. A pilot recognizes that the fundamental challenge of high-workload IFR flight is to:

A. Fly faster

B. Reduce fuel

C. Manage multiple simultaneous tasks accurately while maintaining aircraft control and situational awareness

D. Avoid all calculations

Answer Key

1. B — The altitude to lose is 2,700 − 740 = 1,960 feet. At 120 knots (2 NM per minute), the 4.0 NM final takes 2 minutes, so 1,960 ÷ 2 ≈ 980 fpm. The required descent rate is about 980 fpm.

2. A — In a standard pattern with a strong crosswind on the legs, the outbound wind correction is roughly tripled relative to the inbound, and timed so the aircraft rolls out established on the inbound course. The exaggerated outbound correction compensates for drift during the turns.

3. B — Using the rule of thumb TAS/10 + 7, at 150 knots the bank is 15 + 7 = 22 degrees. This approximates the standard-rate bank.

4. B — 6,000 feet over 20 NM at 150 knots (2.5 NM/min) takes 8 minutes; 6,000 ÷ 8 = 750 fpm. The required rate is about 750 fpm.

5. C — Losing 6,000 feet at roughly 300 ft/NM equivalent requires about 20 NM, so the descent begins about 20 NM before the fix. The 3-degree geometry sets the top of descent.

6. C — Arriving on 350 with an inbound course of 270 (standard right turns) places the aircraft in the teardrop sector. A teardrop entry is correct.

7. B — With wind pushing the aircraft outward off a DME arc, the pilot turns slightly toward the station to tighten the arc back to the correct distance. Small corrections hold the arc.

8. A — A 4.5 NM final at 135 knots groundspeed (2.25 NM/min) takes about 2 minutes. The time is approximately 2 minutes.

9. D — 4,500 feet over 15 NM at 180 knots (3 NM/min) gives 5 minutes; 4,500 ÷ 5 = 900 fpm. The minimum average rate is about 900 fpm.

10. B — (1.8 + 0.6 + 0.75) hours × 10 gph = 3.15 × 10 = 31.5 gallons. The minimum fuel is about 31.5 gallons.

11. C — 3,200 − 1,100 = 2,100 feet over 2.3 NM at 90 knots (1.5 NM/min) takes about 1.53 minutes; 2,100 ÷ 1.53 ≈ 1,370 fpm. The required rate is about 1,370 fpm.

12. D — arcsin(10/100) ≈ 5.7 degrees, which rounds to about 6 degrees. The crab angle is approximately 6 degrees.

13. B — 18,000 − 8,000 = 10,000 feet over 40 NM at 240 knots (4 NM/min) takes 10 minutes; 10,000 ÷ 10 = 1,000 fpm. The required rate is about 1,000 fpm.

14. B — The procedure turn is contained by limiting the outbound leg (commonly about 1 minute) before commencing the reversal, keeping the maneuver within the charted distance. Flying the full distance outbound risks exceeding the protected area.

15. A — 500 fpm at 90 knots (1.5 NM/min) gives 500 ÷ 1.5 ≈ 333 ft/NM. The climb gradient is about 333 ft/NM.

16. D — 350 ft/NM at 120 knots (2 NM/min) requires 350 × 2 = 700 fpm. The required rate of climb is about 700 fpm.

17. B — Time to station = 60 × 1.5 ÷ 10 = 9 minutes. The aircraft is about 9 minutes from the station.

18. C — A 180-degree turn at standard rate (3 degrees per second) takes 60 seconds. The timed turn requires 1 minute.

19. D — The magnetic compass undershoots when turning to north, so the pilot must roll out before reaching the target heading (lead the rollout). UNOS: undershoot north.

20. D — Using groundspeed × 5, a 3-degree path at 140 knots needs 140 × 5 = 700 fpm. The descent rate is about 700 fpm.

21. A — Crossing the fix, the highest of the three (assigned 6,000, expected 4,000, MEA 5,000) applies, so the pilot is at 6,000 feet. The assigned altitude is the highest.

22. C — 120 NM at 240 knots groundspeed takes 120 ÷ 240 × 60 = 30 minutes. The time is about 30 minutes.

23. A — Exactly 2,000 feet and exactly 3 SM meet the 1-2-3 thresholds, so no alternate is required. The values are at, not below, the limits.

24. D — Height above touchdown = DA − TDZE = 250 − 50 = 200 feet. The HAT is 200 feet.

25. B — A teardrop entry uses an outbound leg offset about 30 degrees on the holding side from the reciprocal of the inbound course. The teardrop angle is 30 degrees toward the holding side.

26. B — To intercept the 360 radial inbound (course 180) from the east with a 45-degree intercept, the heading is 180 + 45 = 225. The intercept heading is about 225.

27. C — At or below 6,000 feet MSL the maximum holding speed in the USA is 200 knots. At 5,000 feet the limit is 200 knots.

28. D — Per the oxygen rules, the required flight crew must use supplemental oxygen above 12,500 feet MSL after 30 minutes (and continuously above 14,000). The 12,500-foot/30-minute threshold applies. (At 9,500 feet, none is required — the question tests the rule, and option D states the governing threshold.)

29. A — 3,500 feet at 700 fpm takes 5 minutes; at 120 knots (2 NM/min) that is 10 NM. The descent begins about 10 NM out.

30. D — A tailwind on the outbound leg lengthens the ground distance covered, so the pilot shortens the outbound leg so the inbound leg comes out correct. The inbound timing is the target.

31. C — 800 fpm at 120 knots (2 NM/min) gives 800 ÷ 2 = 400 ft/NM. The descent gradient is about 400 ft/NM.

32. D — VDP distance ≈ HAT ÷ 300 = 400 ÷ 300 ≈ 1.33 NM from the threshold. The VDP is about 1.3 NM out.

33. A — Reaching the computed VDP at the MDA without the runway in sight, the pilot continues at the MDA to the MAP, then goes missed if still not visual. The VDP is advisory; the MAP governs the go-around.

34. C — A 3-degree path needs groundspeed × 5; for 4.5 degrees, scale by 4.5/3 = 1.5. So 130 × 5 × 1.5 = 650 × 1.5 = 975 fpm. The required descent rate is about 975 fpm.

35. B — 2,800 feet at 700 fpm takes 2,800 ÷ 700 = 4 minutes. The time is about 4 minutes.

36. C — 2,000 feet over 8 NM at 150 knots (2.5 NM/min) takes 3.2 minutes; 2,000 ÷ 3.2 ≈ 625 fpm. The minimum average rate is about 625 fpm.

37. C — On an easterly heading, accelerating produces a false indication of a turn toward north (ANDS: accelerate north). The compass shows a turn to the north.

38. A — At 120 knots, 1 NM takes 3,600 ÷ 120 = 30 seconds. The aircraft covers 1 NM in 30 seconds.

39. A — At higher groundspeed, the turn radius grows, so the lead distance to roll into a turn onto an arc or course increases. Faster means leading earlier.

40. D — Reaching 3,000 feet still in the climb segment, the pilot continues per the published missed approach track and altitude. The clearance was "then as published."

41. B — A 15-knot wind at 45 degrees off the tail gives a tailwind component of 15 × cos 45 ≈ 10.6 knots. The component is about 10.5 knots.

42. D — The difference grows when the air is colder than standard, with true altitude lower than indicated. Cold air makes the aircraft lower than the altimeter shows.

43. D — In air colder than standard, the true altitude is lower than indicated, a terrain hazard. "Cold weather, low true altitude."

44. C — 250 ft/NM at 90 knots (1.5 NM/min) requires 250 × 1.5 = 375 fpm. The needed rate of climb is about 375 fpm.

45. B — At 16,000 feet MSL (14,001–above) the maximum holding speed is 265 knots. The high-altitude band uses 265 knots.

46. A — A parallel entry turns outbound on the holding side's reciprocal, then turns to the non-holding side to intercept the inbound course back to the fix. The turn is toward the non-holding side to rejoin.

47. A — arcsin(20/120) ≈ 9.6 degrees, about 10 degrees. The wind correction angle is approximately 10 degrees.

48. D — A 5 NM final at 100 knots (1.67 NM/min) takes about 3 minutes. The time to the MAP is about 3 minutes.

49. A — 4,000 feet over 8 NM at 120 knots (2 NM/min) takes 4 minutes; 4,000 ÷ 4 = 1,000 fpm. The required rate is about 1,000 fpm.

50. A — 1,800 feet over 6 NM gives 1,800 ÷ 6 = 300 ft/NM. The descent gradient is about 300 ft/NM.

51. D — A VDP is not applicable to a circling approach because circling involves maneuvering rather than a straight-in descent path. There is no single straight-in glide path to define a VDP.

52. B — At 180 knots, 1 NM takes 3,600 ÷ 180 = 20 seconds. The aircraft covers 1 NM in 20 seconds.

53. A — Above 14,000 feet the inbound leg is timed for 1.5 minutes; the pilot flies the outbound leg about 1.5 minutes initially, then adjusts for wind to make the inbound leg correct. The inbound timing is the target.

54. D — A 3-degree path at 90 knots: 90 × 5 = 450 fpm. The descent rate is about 450 fpm.

55. B — In the CDFA technique, the descent is continuous and the pilot treats the MDA effectively as a decision altitude, initiating the go-around at or near it if not visual. This avoids the level segment of dive-and-drive.

56. C — A tailwind increases groundspeed, which for a fixed glidepath angle increases the required descent rate. Faster over the ground means a steeper rate to hold the angle.

57. A — Losing 5,000 feet at a maximum of 1,000 fpm requires at least 5 minutes. 5,000 ÷ 1,000 = 5.

58. A — A steeper-than-standard glidepath at the same groundspeed requires a higher descent rate. The steeper angle demands more feet per minute.

59. C — A 6 NM segment in 3 minutes is 2 NM/min, which is 120 knots. The groundspeed is 120 knots.

60. C — The fundamental challenge of high-workload IFR flight is managing multiple simultaneous tasks accurately while maintaining aircraft control and situational awareness. Task management and control are paramount.