PRACTICE EXAM 18

1. A true course of 360° is flown with no wind in an area of 10°E magnetic variation. The magnetic heading is:

A. 360°

B. 010°

C. 350°

D. 370°

2. An aircraft flying a true course of 180° must crab 8° right to hold track. The true heading is:

A. 172°

B. 180°

C. 174°

D. 188°

3. Continuing Question 2, with a true heading of 188° in an area of 5°W variation, the magnetic heading is:

A. 183°

B. 180°

C. 188°

D. 193°

4. At a groundspeed of 80 knots, covering 120 nautical miles will take:

A. 90 minutes

B. 60 minutes

C. 120 minutes

D. 45 minutes

5. An airplane burning 7 gallons per hour flies a leg lasting 1.5 hours. The fuel burned, before reserve, is:

A. 7.0 gallons

B. 14.0 gallons

C. 10.5 gallons

D. 4.5 gallons

6. An aircraft with a true airspeed of 110 knots has a 15-knot direct tailwind. Its groundspeed is:

A. 95 knots

B. 110 knots

C. 15 knots

D. 125 knots

7. A 25-knot wind at 40° to the runway produces a crosswind component of approximately:

A. 25 knots

B. 0 knots

C. 16 knots

D. 19 knots

8. The correction sequence from true course to compass heading applies, in order:

A. Wind, variation, deviation

B. Variation, wind, deviation

C. Deviation, wind, variation

D. Wind, deviation, variation

9. A true course of 270° is flown with no wind in an area of 12°E variation. The magnetic heading is:

A. 258°

B. 270°

C. 282°

D. 246°

10. Departing at 1400Z on a flight estimated to take 1 hour 30 minutes, the estimated time of arrival is:

A. 1430Z

B. 1500Z

C. 1600Z

D. 1530Z

11. A magnetic heading of 350° is corrected for a deviation of +3°. The compass heading is:

A. 347°

B. 353°

C. 350°

D. 356°

12. Flying at a groundspeed of 100 knots for 0.75 hour covers a distance of:

A. 75 nautical miles

B. 100 nautical miles

C. 133 nautical miles

D. 50 nautical miles

13. A flight requires 2.0 hours at 8 gallons per hour, plus a 30-minute day-VFR reserve. The total fuel required is:

A. 16 gallons

B. 20 gallons

C. 24 gallons

D. 12 gallons

14. The "east is least, west is best" rule means easterly variation is:

A. Added to true heading to get magnetic heading

B. Subtracted from true heading to get magnetic heading

C. Ignored when flying east of the prime meridian

D. Applied only to the compass deviation card

15. An airplane with a true airspeed of 100 knots faces a 25-knot direct headwind. Its groundspeed is:

A. 125 knots

B. 100 knots

C. 75 knots

D. 25 knots

16. A 25-knot wind at 40° to the runway produces a headwind component of approximately:

A. 25 knots

B. 19 knots

C. 16 knots

D. 0 knots

17. A pilot needs to cover 150 nautical miles and the groundspeed is 100 knots. The time en route is:

A. 60 minutes

B. 90 minutes

C. 120 minutes

D. 150 minutes

18. A true heading of 045° is corrected for 7°E variation. The magnetic heading is:

A. 052°

B. 045°

C. 038°

D. 059°

19. A pilot computes a leg of 60 nautical miles at a groundspeed of 120 knots, burning 6 gallons per hour. The fuel for that leg is:

A. 6.0 gallons

B. 1.5 gallons

C. 6.5 gallons

D. 3.0 gallons

20. Wind direction in the winds aloft forecast and on the navigation chart is referenced to:

A. Magnetic north used by control towers

B. The aircraft's compass heading

C. The runway alignment

D. True north

21. A crosswind component pushing the airplane off course requires the pilot to apply a:

A. Wind correction angle (crab) into the wind

B. Reduction in true airspeed

C. Change to the magnetic deviation card

D. Increase in the propeller pitch

22. A flight of 80 nautical miles at a groundspeed of 80 knots takes:

A. 30 minutes

B. 90 minutes

C. 60 minutes

D. 120 minutes

23. A true course of 090° requires a 6° left crab to hold track. The true heading is:

A. 084°

B. 096°

C. 090°

D. 102°

24. Burning 9 gallons per hour over a 2-hour flight uses, before reserve:

A. 18 gallons

B. 9 gallons

C. 11 gallons

D. 4.5 gallons

25. A magnetic heading of 120° is corrected for a deviation of −4°. The compass heading is:

A. 124°

B. 116°

C. 120°

D. 112°

26. Departing at 0930Z on a flight estimated at 2 hours 15 minutes, the ETA is:

A. 1045Z

B. 1130Z

C. 1230Z

D. 1145Z

27. Groundspeed is the appropriate speed for computing time en route because it:

A. Reflects the airplane's actual speed over the ground

B. Equals the indicated airspeed in all conditions

C. Is read directly off the airspeed indicator

D. Ignores the effect of wind entirely

28. A true course of 315° is flown with no wind in 8°W variation. The magnetic heading is:

A. 307°

B. 315°

C. 311°

D. 323°

29. A pilot covering 45 nautical miles at a groundspeed of 90 knots will arrive in:

A. 45 minutes

B. 30 minutes

C. 60 minutes

D. 20 minutes

30. The total fuel required for a flight is computed as:

A. Leg fuel only, with no allowance for reserve

B. Leg fuel plus taxi, climb, and the required reserve

C. The reserve fuel alone

D. The aircraft's full tank capacity regardless of the leg

31. A true heading of 200° is corrected for 9°E variation. The magnetic heading is:

A. 209°

B. 200°

C. 191°

D. 218°

32. An airplane flies 100 nautical miles in 50 minutes. Its groundspeed is:

A. 100 knots

B. 50 knots

C. 120 knots

D. 150 knots

33. A direct tailwind affects the time en route by:

A. Decreasing it, since groundspeed increases

B. Increasing it, since groundspeed decreases

C. Having no effect on the time

D. Requiring a larger wind correction angle

34. A pilot must convert a true course to a compass heading. The intermediate value after applying wind is the:

A. Compass heading

B. Magnetic heading

C. Variation

D. True heading

35. A flight of 240 nautical miles at a groundspeed of 120 knots takes:

A. 1 hour

B. 1 hour 30 minutes

C. 2 hours

D. 3 hours

36. A pilot's leg requires 1 hour 20 minutes. At a fuel burn of 6 gallons per hour, the leg fuel is:

A. 6.0 gallons

B. 12.0 gallons

C. 10.0 gallons

D. 8.0 gallons

37. A true course of 045° with a 10° right crab gives a true heading of:

A. 035°

B. 055°

C. 045°

D. 065°

38. A 30-knot wind directly down the runway produces a:

A. 30-knot crosswind component

B. 30-knot headwind component

C. 15-knot headwind and 15-knot crosswind

D. Zero wind effect on the takeoff

39. Departing at 1815Z on a 45-minute flight, the ETA is:

A. 1845Z

B. 1830Z

C. 1900Z

D. 1930Z

40. A pilot computes a total flight time of 1.5 hours at 10 gallons per hour, plus a 30-minute reserve. The total fuel required is:

A. 20 gallons

B. 15 gallons

C. 25 gallons

D. 10 gallons

ANSWER KEY WITH EXPLANATIONS

1. C — 350°. With no wind, true heading equals the true course (360°); applying 10°E variation gives 360 − 10 = 350° ("east is least"). The conversion is straightforward when there is no wind correction.

2. D — 188°. A true course of 180° with an 8° right crab gives a true heading of 180 + 8 = 188°. The wind correction angle is added when crabbing right.

3. D — 193°. Applying 5°W variation to a true heading of 188° gives 188 + 5 = 193° ("west is best"). Westerly variation is added to reach magnetic heading.

4. A — 90 minutes. Time equals distance divided by groundspeed: 120 ÷ 80 = 1.5 hr = 90 minutes. Groundspeed drives trip time.

5. C — 10.5 gallons. Fuel burned equals rate times time: 7 gph × 1.5 hr = 10.5 gallons, before reserve. This is the basic fuel computation.

6. D — 125 knots. Groundspeed is true airspeed plus a direct tailwind: 110 + 15 = 125 kt. A tailwind increases groundspeed.

7. C — 16 knots. A 25-knot wind at 40° off the runway gives a crosswind component of 25 × sin 40° ≈ 16 kt. The sine term governs the crosswind portion.

8. A — Wind, variation, deviation. From true course, corrections apply in the order wind (to true heading), variation (to magnetic heading), then deviation (to compass heading). This is the TVMDC chain.

9. A — 258°. With no wind, true heading equals the course (270°); applying 12°E variation gives 270 − 12 = 258°. Easterly variation is subtracted.

10. D — 1530Z. Adding 1 hour 30 minutes to a 1400Z departure gives 1530Z. ETA is departure time plus time en route.

11. B — 353°. Compass heading is magnetic heading corrected for deviation: 350 + 3 = 353°. Deviation is applied last in the conversion chain.

12. A — 75 nautical miles. Distance equals groundspeed times time: 100 kt × 0.75 hr = 75 nm. The time must be in hours for the product to give nautical miles.

13. B — 20 gallons. Leg fuel is 2.0 hr × 8 gph = 16 gal; the 30-minute reserve adds 0.5 × 8 = 4 gal, totaling 20 gallons. Reserve fuel must always be included.

14. B — Subtracted from true heading to get magnetic heading. Easterly variation is subtracted from true heading ("east is least") to get magnetic heading. Westerly variation is added.

15. C — 75 knots. Groundspeed is true airspeed minus a direct headwind: 100 − 25 = 75 kt. A headwind reduces groundspeed.

16. B — 19 knots. A 25-knot wind at 40° off the runway gives a headwind component of 25 × cos 40° ≈ 19 kt. The cosine term governs the headwind portion.

17. B — 90 minutes. Time equals distance divided by groundspeed: 150 ÷ 100 = 1.5 hr = 90 minutes. This is the time-speed-distance relationship.

18. C — 038°. Applying 7°E variation to a true heading of 045° gives 045 − 7 = 038° ("east is least"). Easterly variation is subtracted.

19. D — 3.0 gallons. Leg time is 60 ÷ 120 = 0.5 hr; fuel is 6 gph × 0.5 hr = 3.0 gal. The calculation chains groundspeed → time → fuel.

20. D — True north. Winds aloft forecasts and navigation charts reference direction to true north. Tower/ATIS winds, by contrast, are magnetic.

21. A — A wind correction angle (crab) into the wind. A crosswind requires a wind correction angle—crabbing into the wind—to maintain the intended track. It does not change airspeed or the deviation card.

22. C — 60 minutes. Time equals distance divided by groundspeed: 80 ÷ 80 = 1.0 hr = 60 minutes. Equal distance and groundspeed yield one hour.

23. A — 084°. A true course of 090° with a 6° left crab gives a true heading of 090 − 6 = 084°. A left crab subtracts the correction angle.

24. A — 18 gallons. Fuel burned is 9 gph × 2 hr = 18 gallons, before reserve. Rate times time gives fuel.

25. B — 116°. Compass heading is magnetic heading corrected for deviation: 120 + (−4) = 116°. A negative deviation is subtracted.

26. D — 1145Z. Adding 2 hours 15 minutes to a 0930Z departure gives 1145Z. ETA is departure plus time en route.

27. A — Reflects the airplane's actual speed over the ground. Groundspeed is used because it is the airplane's true speed over the ground, accounting for wind. Airspeed alone would ignore the wind's effect.

28. D — 323°. With no wind, true heading equals the course (315°); applying 8°W variation gives 315 + 8 = 323° ("west is best"). Westerly variation is added.

29. B — 30 minutes. Time equals distance divided by groundspeed: 45 ÷ 90 = 0.5 hr = 30 minutes. The calculation uses groundspeed.

30. B — Leg fuel plus taxi, climb, and the required reserve. Total fuel includes the leg burn plus allowances for taxi, climb, and the required reserve. Planning leg fuel alone risks exhaustion.

31. C — 191°. Applying 9°E variation to a true heading of 200° gives 200 − 9 = 191° ("east is least"). Easterly variation is subtracted.

32. C — 120 knots. Groundspeed equals distance divided by time: 100 nm ÷ (50/60) hr = 120 kt. The 50 minutes must be converted to hours.

33. A — Decreasing it, since groundspeed increases. A tailwind raises groundspeed, which decreases the time en route. A headwind would do the opposite.

34. D — True heading. After applying wind to the true course, the intermediate value is the true heading; variation then yields magnetic heading. The order is true course → true heading → magnetic → compass.

35. C — 2 hours. Time equals distance divided by groundspeed: 240 ÷ 120 = 2.0 hours. Straightforward time-speed-distance.

36. D — 8.0 gallons. 1 hour 20 minutes is 1.333 hours; fuel is 6 gph × 1.333 hr = 8.0 gallons. The minutes must be converted to a decimal hour.

37. B — 055°. A true course of 045° with a 10° right crab gives a true heading of 045 + 10 = 055°. A right crab adds the correction angle.

38. B — 30-knot headwind component. A wind directly down the runway is entirely headwind, so a 30-knot wind gives a 30-knot headwind component with no crosswind. The full wind is headwind when aligned with the runway.

39. C — 1900Z. Adding 45 minutes to an 1815Z departure gives 1900Z. ETA is departure plus time en route.

40. A — 20 gallons. Leg fuel is 1.5 hr × 10 gph = 15 gal; the 30-minute reserve adds 0.5 × 10 = 5 gal, totaling 20 gallons. Reserve must always be added.