PRACTICE EXAM 14

1. The primary chart used for VFR navigation is which of the following?

A. The IFR low-altitude en route chart

B. The sectional chart

C. The world aeronautical planning chart only

D. The instrument approach plate

2. A sectional chart is drawn at what scale?

A. 1:1,000,000

B. 1:250,000

C. 1:500,000

D. 1:100,000

3. On a sectional chart, one minute of latitude equals what distance?

A. One nautical mile

B. One statute mile

C. One kilometer

D. Ten nautical miles

4. Pilotage is best described as navigation by which means?

A. Tracking radials from ground-based navigation aids

B. Computing heading and time from wind and airspeed

C. Visual reference to landmarks identified on a chart

D. Following a satellite-generated magenta line only

5. Dead reckoning is best described as navigation by what method?

A. Following highways and railroads visually

B. Tuning a navigation receiver to a station

C. Asking air traffic control for vectors

D. Computing position from heading, airspeed, wind, and elapsed time

6. Variation is best defined as which of the following?

A. The compass error from the aircraft's own magnetic fields

B. The wind correction angle applied to a course

C. The difference between indicated and true airspeed

D. The angular difference between true north and magnetic north

7. Deviation is best defined as which of the following?

A. The angle between true and magnetic north

B. The wind's effect on groundspeed

C. The compass error caused by the aircraft's own magnetic fields

D. The difference between pressure and density altitude

8. Isogonic lines on a chart connect points of equal what?

A. Equal terrain elevation

B. Equal magnetic variation

C. Equal barometric pressure

D. Equal temperature

9. The correct sequence to convert a true course into a compass heading is which of the following?

A. Compass, Deviation, Magnetic, Variation, True

B. Magnetic, True, Variation, Deviation, Compass

C. True, Deviation, Variation, Magnetic, Compass

D. True, Variation, Magnetic, Deviation, Compass

10. When converting a true course to a magnetic course, the rule "east is least, west is best" means what?

A. Subtract easterly variation and add westerly variation

B. Add easterly variation and subtract westerly variation

C. Always add the variation regardless of direction

D. Always subtract the variation regardless of direction

11. A true course of 100° is measured where the variation is 10° East. What is the magnetic course before wind and deviation?

A. 110°

B. 90°

C. 100°

D. 80°

12. A pilot selects checkpoints along a route for what purpose?

A. To increase the aircraft's cruise speed

B. To reduce the required fuel reserve

C. To eliminate the need for a chart

D. To confirm progress and detect drift from the intended course

13. Good checkpoints for pilotage are best described as which of the following?

A. Distinctive, easily identified landmarks visible from altitude

B. Small features visible only from low altitude

C. Features that change appearance seasonally

D. Points located only at the destination

14. Groundspeed is best defined as which of the following?

A. The aircraft's actual speed over the ground

B. The aircraft's speed through the air mass

C. The speed shown on the airspeed indicator

D. The speed of the wind alone

15. A headwind affects a cross-country flight in which way?

A. It increases groundspeed and reduces time

B. It reduces groundspeed, increasing time and fuel burn

C. It has no effect on time or fuel

D. It only changes the wind correction angle

16. A tailwind affects a cross-country flight in which way?

A. It decreases groundspeed and increases time

B. It increases groundspeed, reducing time and fuel burn

C. It requires a large wind correction angle only

D. It has no measurable effect

17. The wind correction angle (WCA) is applied for what reason?

A. So the aircraft tracks the intended course despite wind drift

B. To increase the aircraft's true airspeed

C. To convert true course to magnetic course

D. To set the altimeter correctly

18. The wind triangle relates which set of quantities?

A. True airspeed and heading, wind, and the resulting groundspeed and course

B. Pressure altitude, temperature, and density altitude

C. Weight, arm, and moment

D. Pitch, roll, and yaw

19. Latitude lines (parallels) are measured in which direction?

A. East and west from the prime meridian

B. Only at the equator

C. Around the poles in circles

D. North and south from the equator

20. Longitude lines (meridians) are measured in which direction?

A. North and south from the equator

B. Only along the equator

C. East and west from the prime meridian

D. In a spiral around the globe

21. A pilot can measure distance directly on a sectional by stepping off minutes of latitude because what is true?

A. One minute of longitude equals one nautical mile everywhere

B. The latitude scale shows statute miles

C. One minute of latitude equals one nautical mile

D. The chart has no usable distance scale

22. The maximum elevation figure (MEF) in each quadrangle of a sectional helps a pilot do what?

A. Choose a safe minimum altitude

B. Determine the local altimeter setting

C. Calculate the fuel burn rate

D. Identify the nearest control tower frequency

23. A non-towered airport is depicted on a sectional with what color symbol?

A. A blue airport symbol

B. A green airport symbol

C. A magenta airport symbol

D. A red airport symbol

24. A towered airport is depicted on a sectional with what color symbol?

A. A magenta airport symbol

B. A green airport symbol

C. A blue airport symbol

D. A red airport symbol

25. A pilot computes Time = Distance ÷ Groundspeed. For a 60-NM leg at 90 knots, the time is which of the following?

A. 30 minutes

B. 40 minutes

C. 50 minutes

D. 60 minutes

26. Why must a pilot keep true and magnetic references straight when navigating?

A. Because all charts are in magnetic and all instruments in true

B. Because winds aloft and charted courses are true, while runway numbers and the compass are magnetic

C. Because variation does not exist in the United States

D. Because deviation is the same as variation

27. Fuel required for a flight is best computed as which of the following?

A. Distance multiplied by airspeed

B. Groundspeed divided by burn rate

C. The total tank capacity minus taxi fuel only

D. Time en route multiplied by burn rate, plus the required reserve

28. The 50-nautical-mile operating limit for a Recreational Pilot is measured from what point?

A. The intended destination airport

B. The departure airport

C. The geographic center of the state

D. The pilot's home of record

29. Each time a Recreational Pilot departs from a new airport, what happens to the 50-NM limit?

A. The limit no longer applies after the first leg

B. A new 50-NM circle is centered on the new departure airport

C. The limit doubles to 100 NM

D. The limit is measured from the original departure only

30. To fly beyond the 50-NM limit, a Recreational Pilot must obtain what?

A. A new medical certificate

B. A multi-engine rating

C. A commercial pilot certificate

D. A cross-country endorsement carried in the logbook

31. A course line drawn on a sectional is measured for direction using what tool?

A. A flight computer's wind side only

B. The aircraft's tachometer

C. A fuel totalizer

D. A plotter

32. The magnetic compass is valuable because it does what?

A. Senses direction without electrical or vacuum power

B. Requires the alternator to function

C. Depends on the gyroscopic instruments

D. Operates only above 10,000 feet

33. A pilot flying a 45-NM leg at a groundspeed of 90 knots will take how long?

A. 45 minutes

B. 20 minutes

C. 60 minutes

D. 30 minutes

34. Why does a direct crosswind primarily require a wind correction angle rather than a large speed change?

A. Because it adds directly to true airspeed

B. Because it subtracts directly from true airspeed

C. Because it stops the aircraft from drifting on its own

D. Because it pushes the aircraft sideways rather than speeding or slowing it along the course

35. Obstacles on a sectional chart are marked with symbols showing what?

A. Their distance from the nearest airport

B. Their height and whether they are lighted

C. Their construction material

D. Their owner's name

36. Terrain elevation on a sectional is shown by which of the following?

A. Only the airport data blocks

B. Radio frequencies printed on the chart

C. Contour lines, color tinting, and elevation figures

D. The compass rose alone

37. A pilot planning a cross-country flight first draws what on the chart?

A. The traffic pattern at the destination

B. The fuel burn calculation

C. The course line from departure to destination

D. The weight-and-balance graph

38. The relationship Groundspeed = Distance ÷ Time would give what for 40 NM covered in 30 minutes?

A. 80 knots

B. 60 knots

C. 100 knots

D. 120 knots

39. Why should a pilot plan fuel conservatively against a forecast headwind?

A. Headwinds reduce the fuel burn

B. Headwinds have no effect on planning

C. Headwinds shorten the time en route

D. Headwinds increase time en route and therefore fuel burn

40. Within the 50-NM limit, a Recreational Pilot must still avoid which airspace unless separately endorsed?

A. Class G airspace near the surface

B. Airspace requiring two-way communication with ATC

C. Class E airspace en route

D. Uncontrolled practice areas

41. A pilot comparing actual time over a checkpoint to planned time can do what?

A. Refine the groundspeed estimate and update arrival and fuel figures

B. Recalculate the magnetic variation

C. Reset the altimeter to the correct value

D. Determine the aircraft's empty weight

42. Latitude and longitude are expressed in which units?

A. Feet, yards, and miles

B. Pounds, gallons, and knots

C. Degrees Celsius and Fahrenheit

D. Degrees, minutes, and seconds

43. A pilot finds the destination lies 55 NM from the departure airport and holds no endorsements. What is the status?

A. Legal, since it is within 60 NM

B. Legal, because the limit resets in flight

C. Legal on the return leg only

D. Illegal, because it exceeds the 50-NM limit without the cross-country endorsement

44. The airport data block on a sectional typically lists which information?

A. Elevation, runway length, and frequencies

B. The aircraft's weight and balance

C. The pilot's certificate number

D. The current weather forecast

45. Why is dead reckoning used together with pilotage rather than alone?

A. Because pilotage requires a navigation receiver

B. Because the two methods reinforce each other, computation confirmed by visual checkpoints

C. Because dead reckoning needs no chart

D. Because pilotage works only at night

46. A pilot measuring a true course of 270° where variation is 12° East obtains what magnetic course?

A. 258°

B. 282°

C. 270°

D. 246°

47. Why does the magnetic compass require correction for deviation specific to each aircraft?

A. Because variation changes with altitude

B. Because the wind affects the compass

C. Because each airplane's own magnetic fields differ

D. Because the alternator powers the compass

48. A pilot wanting efficient en route altitudes and accurate headwind/tailwind planning consults which product?

A. The aircraft maintenance logbook

B. A METAR only

C. The winds and temperatures aloft forecast

D. The compass correction card

49. A pilot covering 90 NM in 1 hour determines the groundspeed to be what?

A. 60 knots

B. 90 knots

C. 120 knots

D. 45 knots

50. Why does the latitude scale, rather than the longitude scale, provide a reliable distance reference on a chart?

A. Because longitude lines never appear on charts

B. Because latitude is measured in statute miles

C. Because one minute of latitude consistently equals one nautical mile

D. Because longitude equals two nautical miles per minute everywhere

Answer Key & Explanations

1. B — The sectional chart is the primary chart for VFR navigation, depicting terrain, obstacles, airports, and airspace. IFR charts and approach plates serve instrument operations.

2. C — The sectional chart is drawn at a scale of 1:500,000. This scale balances detail and coverage for VFR navigation.

3. A — One minute of latitude equals one nautical mile, allowing distance to be stepped off along the chart's side scale. This is the basis of chart distance measurement.

4. C — Pilotage is navigation by visual reference to landmarks identified on a chart. Dead reckoning, by contrast, computes position from heading, airspeed, wind, and time.

5. D — Dead reckoning computes position from a known starting point using heading, airspeed, wind, and elapsed time. It complements pilotage rather than relying on visual landmarks.

6. D — Variation is the angular difference between true north and magnetic north at a location, shown by isogonic lines. It is applied to convert true to magnetic.

7. C — Deviation is the compass error caused by the aircraft's own magnetic fields, recorded on a compass correction card. It differs from variation, which is a property of location.

8. B — Isogonic lines connect points of equal magnetic variation. They allow a pilot to apply the correct variation for the area being flown.

9. D — The conversion sequence is True → Variation → Magnetic → Deviation → Compass, captured by "True Virgins Make Dull Companions." This converts a charted course into the compass heading to fly.

10. A — "East is least, west is best" means subtract easterly variation and add westerly variation when converting true to magnetic. This yields the correct magnetic course.

11. B — Converting true to magnetic, easterly variation is subtracted: 100° − 10° = 90°. The magnetic course is 90° before wind and deviation.

12. D — Checkpoints confirm progress and detect drift from the intended course. Comparing actual to planned times also refines groundspeed and fuel estimates.

13. A — Good checkpoints are distinctive, easily identified landmarks visible from altitude, such as highway intersections or lakes. Small or seasonal features make poor checkpoints.

14. A — Groundspeed is the aircraft's actual speed over the ground, differing from airspeed by the wind's effect. A headwind reduces it and a tailwind increases it.

15. B — A headwind reduces groundspeed, which increases time en route and therefore fuel burn. This is why headwinds must be planned for conservatively.

16. B — A tailwind increases groundspeed, reducing time en route and fuel burn. It is the favorable counterpart to a headwind.

17. A — The wind correction angle is applied so the aircraft tracks the intended course despite wind drift. The pilot points the nose slightly into the wind.

18. A — The wind triangle relates true airspeed and heading, the wind, and the resulting groundspeed and true course. It is the vector solution for navigation in wind.

19. D — Latitude lines (parallels) are measured north and south from the equator. Longitude lines, by contrast, are measured east and west.

20. C — Longitude lines (meridians) are measured east and west from the prime meridian. Latitude is measured north and south from the equator.

21. C — A pilot can step off minutes of latitude to measure distance because one minute of latitude equals one nautical mile. This needs no separate ruler.

22. A — The maximum elevation figure helps a pilot choose a safe minimum altitude by showing the highest terrain or obstacle in each quadrangle. It supports terrain clearance.

23. C — A non-towered airport is depicted with a magenta airport symbol. A towered airport uses a blue symbol.

24. C — A towered airport is depicted with a blue airport symbol. A non-towered airport uses magenta.

25. B — Time = 60 NM ÷ 90 kt = 0.667 hour = 40 minutes. Dividing distance by groundspeed and converting to minutes gives the leg time.

26. B — Winds aloft forecasts and charted courses are in true, while runway numbers and the compass are magnetic, so the two must be reconciled by applying variation. Mixing them produces a heading error.

27. D — Fuel required is the time en route multiplied by the burn rate, plus the required reserve. This ensures enough fuel for the flight and the legal margin.

28. B — The 50-NM limit is measured from the departure airport, so each new departure creates its own circle. It is not measured from the destination or home.

29. B — Each new departure airport creates its own 50-NM circle centered on it. The limit does not vanish or change size after the first leg.

30. D — To fly beyond 50 NM, the Recreational Pilot must obtain a cross-country endorsement and carry the endorsed logbook. No medical, rating, or certificate change substitutes for it.

31. D — A plotter is used to measure the direction of a course line drawn on a sectional. It also helps measure distance against the chart scale.

32. A — The magnetic compass senses direction without electrical or vacuum power, making it uniquely independent. It is subject to predictable errors but always available.

33. D — Time = 45 NM ÷ 90 kt = 0.5 hour = 30 minutes. The leg takes half an hour.

34. D — A direct crosswind mainly pushes the aircraft sideways rather than speeding or slowing it along the course, so it primarily requires a wind correction angle. Its effect on groundspeed along the course is small.

35. B — Obstacles on a sectional are marked with symbols showing their height and whether they are lighted. This helps a pilot avoid towers and other hazards.

36. C — Terrain elevation is shown by contour lines, color tinting, and elevation figures. These let a pilot judge terrain clearance.

37. C — A pilot first draws the course line from departure to destination on the chart. The course is then measured for direction and distance.

38. A — Groundspeed = 40 NM ÷ (30/60 hr) = 40 ÷ 0.5 = 80 knots. Converting minutes to a fraction of an hour before dividing gives the correct speed.

39. D — A forecast headwind increases time en route and therefore fuel burn, so fuel must be planned conservatively. Underestimating wind effect is a common cause of fuel exhaustion.

40. B — Even within the 50-NM limit, a Recreational Pilot must avoid airspace requiring two-way ATC communication unless separately endorsed. Class E and G near non-towered fields remain available.

41. A — Comparing actual to planned time over a checkpoint lets a pilot refine the groundspeed estimate and update arrival and fuel figures. This keeps the flight plan accurate as conditions change.

42. D — Latitude and longitude are expressed in degrees, minutes, and seconds. This system grids the chart for precise position reference.

43. D — A destination 55 NM from the departure airport exceeds the 50-NM limit and is illegal without the cross-country endorsement. The limit does not reset in flight and is measured from departure.

44. A — The airport data block on a sectional lists elevation, runway length, and frequencies, among other data. It gives the essential operational facts for that airport.

45. B — Dead reckoning and pilotage reinforce each other: computation predicts position and time, while visual checkpoints confirm them. Using both improves accuracy and confidence.

46. A — Converting true to magnetic, easterly variation is subtracted: 270° − 12° = 258°. The magnetic course is 258° before wind and deviation.

47. C — The magnetic compass requires a deviation correction specific to each aircraft because each airplane's own magnetic fields differ. The compass correction card records these values.

48. C — The winds and temperatures aloft forecast guides altitude selection and headwind/tailwind planning. It gives forecast wind and temperature at various altitudes.

49. B — Groundspeed = 90 NM ÷ 1 hr = 90 knots. Dividing distance by time in hours gives the average speed.

50. C — The latitude scale provides a reliable distance reference because one minute of latitude consistently equals one nautical mile. Longitude spacing varies with latitude and is not a reliable distance measure.