



Headquarters Air Cadets Examination

Senior Cadet

32/3 Air Navigation

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1. Use black or dark blue pen, NOT pencil.
2. Mark one answer per question with a cross.
3. If you wish to change an answer, cancel the original mark and mark another single answer.

☒ A selected answer.☒ A cancelled answer.Mark:

Name and Initials _____

Date of Exam _____

Date of Birth _____

Squadron/Unit _____

Wing _____

- 1 The distance between two points on a navigation chart can be measured with dividers. What scale will then be used to convert that distance to nautical miles:

- a ☐ 1:50,000 scale
- b ☐ Any meridian scale off any chart
- c ☐ The minute scale along a parallel of latitude
- d ☐ The minute scale along a meridian, close to the area of interest on the chart

- 2 Dundee is due north of Abergavenny. If their latitudes are 56 27N and 51 50N, how far apart are they:

- a ☐ 323nms
- b ☐ 277kms
- c ☐ 277nms
- d ☐ 323kms

- 3 In aviation, speed is measured in:

- a ☐ Kilometres per hour (km/hr)
- b ☐ Miles per hour (mph)
- c ☐ Knots (kts)
- d ☐ Metres per hour (m/hr)

- 4 How fast must an aircraft fly to cover 1200nm in 3 hours:

- a ☐ 400kts
- b ☐ 800kts
- c ☐ 400mph
- d ☐ 3600kts

- 5 Universal Time (UT) is used as the standard in military and commercial aviation. What other name is this known as:

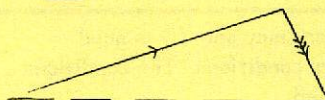
- a ☐ Greenwich meantime
- b ☐ European daylight saving time
- c ☐ Local time
- d ☐ British summer time

- 6 A vector is a line, drawn to represent a velocity. This is achieved by:

- a ☐ The length represents mph at all times
- b ☐ The bearing represents knots at all times
- c ☐ The bearing of the line represents the direction and the length of the line representing the speed
- d ☐ The bearing represents speed and the length represents direction

- 7 In the Air Triangle drawn here, name the components of the 3rd side, represented by a dotted line:

- a ☐ Track and groundspeed
- b ☐ Heading
- c ☐ Wind velocity
- d ☐ Track



- 8 You are flying at 120knots groundspeed. How long will it take to fly 20nms:

- a ☐ 6 minutes
- b ☐ 60 minutes
- c ☐ 10 minutes
- d ☐ 2 minutes

- 9 Aircrew are always aware of their Estimated Time of Arrival (ETA). Why is this:

- a ☐ ETA is important for fuel calculations and air traffic control purposes
- b ☐ A revised ETA tells them that the wind has changed
- c ☐ It is the Easiest calculation to do
- d ☐ Fuel flow rate depends on ETA

- 10 An aircraft is flying from Point A to Point B. Halfway a pinpoint fix shows it to be off track. A line between point A and the fix would be known as:

- a ☐ Track made good
- b ☐ Track required
- c ☐ Drift
- d ☐ Revised track

- 11 Using the 1 in 60 rule, calculate how many miles off track an aircraft will be, if it flies 60nms with a track error of 2 degrees:

- a ☐ 6nms
- b ☐ 4nms
- c ☐ 2nms
- d ☐ 60nms

12 An aircraft is flying from A to B, after 20 nms it is found to be 3nms off track. What is the track error:

- a ☐ 9 degrees
- b ☐ 4 degrees
- c ☐ 6 degrees
- d ☐ 2 degrees

13 An aircraft is flying from A to B, a distance of 120nms. Halfway, a fix shows the aircraft to be 4nms right of track. What heading change does the pilot require to reach point B:

- a ☐ 8 degrees to the left
- b ☐ 4 degrees to the right
- c ☐ 4 degrees to the left
- d ☐ 8 degrees to the right

14 20nm after take-off for a pre-planned destination, a pilot finds that he is 3nm off track. By how much does the pilot need to turn to regain the intended track after flying a further 20nm:

- a ☐ 3 degrees
- b ☐ 18 degrees
- c ☐ 6 degrees
- d ☐ 9 degrees

15 An aircraft flying from A to B finds that after 40nms it is 6nms right of track. If it has a further 30nms to travel, by how much does the pilot need to turn, to regain the intended track at B:

- a ☐ 24 degrees right
- b ☐ 12 degrees left
- c ☐ 21 degrees left
- d ☐ 18 degrees left

16 When would a Direct Indicating Compass be most accurate:

- a ☐ In a turn
- b ☐ In unaccelerated flight
- c ☐ In a steady descent
- d ☐ In a steady climb

17 Which of the following statements, about the gyro-magnetic compass is true:

- a ☐ The gyro-magnetic compass is less accurate than the Direct Indicating Compass
- b ☐ The gyroscope takes over from the flux valve, whenever the aircraft turns
- c ☐ The flux-valve controls the speed of the gyroscope
- d ☐ When the aircraft climbs or descends, the flux valve takes over from the gyroscope

18 Why is a gyroscope used, in a gyro-magnetic compass system:

- a ☐ A gyro requires no power supply
- b ☐ A gyro does not suffer from 'wander'
- c ☐ A gyro is always accurate, without error
- d ☐ A gyroscope is extremely accurate for short periods of time

19 Within an Inertial Navigation System, the movement of the aircraft is measured by sensors called:

- a ☐ Inertials
- b ☐ Accelerators
- c ☐ Axis
- d ☐ Accelerometers

20 Beginners may only fly in good weather conditions. The conditions are called:

- a ☐ Runway Visual Range
- b ☐ Visual Circuits
- c ☐ Instrument Meteorological Conditions
- d ☐ Visual Meteorological Conditions

21 A wind is blowing at 90 degrees angle off the runway direction. If the wind speed is 20 kts. What is the crosswind component:

- a ☐ 10kts
- b ☐ 2 kts
- c ☐ 12 kts
- d ☐ 20 kts

22 The airfield has a covering of shallow fog. A pilot circling directly overhead, sees the runway lights clearly. However, on the approach to land, he may have great difficulty in seeing some lights. Why is this:

- a ☐ Runway lights are designed to be seen from high level only
- b ☐ Fog will appear thicker when on the glide path, because the pilot is looking at a shallower angle
- c ☐ Fog is more dense, closer to the ground
- d ☐ The thickest fog always settles at the end of the runway

23 The collective noun for rain, sleet, snow and hail is:

- a ☐ IMC
- b ☐ Precipitation
- c ☐ VMC
- d ☐ Participation

24 What effect can icing have on the aerodynamics of an aircraft:

- a ☐ Ice forming on the leading edge of the wing, will increase lift
- b ☐ There will be no adverse effect upon the aerodynamics
- c ☐ The windscreen may freeze over
- d ☐ Lift will decrease and weight will increase

25 Which way does the Earth revolve on its axis:

- a ☐ South to North
- b ☐ West to East
- c ☐ East to West
- d ☐ North to South