



Headquarters Air Cadets Examination

Senior Cadet
32/3 Air Navigation
Generated 17-Jul-00

Serial: 267

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 Distance on the Earth's surface is measured in Nautical Miles (nm). Which of the following is true:

- a ☐ One nm is equal to one minute of latitude
- b ☐ One nm is equal to one minute of longitude
- c ☐ One nm equals 1/10,000 of the distance from the North Pole to the Equator
- d ☐ One nm is equal to 5280 feet

2 Oslo Airport (Norway) is due north of Braunschweig airfield, near Hannover (Germany). If their latitudes are 59 53N and 52 20N respectively, how far are they apart:

- a ☐ 453nms
- b ☐ 454nms
- c ☐ 554nms
- d ☐ 445nms

3 Rectified Air Speed (RAS) equals Indicated Air Speed (IAS) plus corrections for:

- a ☐ Pressure and Instrument error
- b ☐ Instrument error only
- c ☐ Pressure error only
- d ☐ Altitude error

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

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

5 What time is used as standard in military and commercial aviation:

- a ☐ Greenwich mean time (Universal time)
- b ☐ European daylight saving time
- c ☐ British summer time
- d ☐ The time of the country over which the aircraft is flying

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 of velocities, DRIFT is:

- a ☐ The angle between heading and wind vectors
- b ☐ The angle between heading and track vectors
- c ☐ The angle between the wind and track vectors
- d ☐ The bearing of the wind vector

8 You fly between 2 features on the ground, and note that it takes 3 minutes. If the features are 18nm apart, what is your groundspeed:

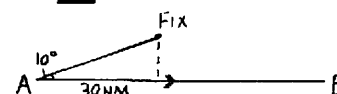
- a ☐ 54kts
- b ☐ 180kts
- c ☐ 280kts
- d ☐ 360kts

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

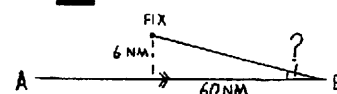
10 An aircraft flying from A to B. After flying 30nms, a fix shows the aircraft to have a track error of 10 degrees. How far is the aircraft off track at the time of the fix:

- a ☐ 3nms
- b ☐ 5nms
- c ☐ 2nms
- d ☐ 6nms



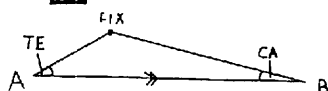
11 An aircraft flying from A to B finds itself 6nms off track. It has a further 60nms to travel. What is the required closing angle:

- a ☐ 2 degrees
- b ☐ 6 degrees
- c ☐ 10 degrees
- d ☐ 3 degrees



- 12 An aircraft when flying from A to B is found to be off track at the pinpoint shown below. The pilot calculates the track error (TE) as 6 degrees and the closing angle (CA) of 3 degrees. By how much does the pilot need to turn to reach point B:

- a ☐ 9 degrees to the left
- b ☐ 2 degrees to the left
- c ☐ 9 degrees to the right
- d ☐ 2 degrees to the right



- 13 20nm after take-off for a pre-planned destination, a pilot finds that he is 3nm of track. By how much does the pilot need to turn to regain the intended track after flying a further 20nm:

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

- 14 An aircraft flying from A to B finds that after 20nms, it is 2nms right of track. If it has a further 40nms to travel, by how much does the pilot need to turn, to regain the intended track at B:

- a ☐ 12 degrees left
- b ☐ 6 degrees left
- c ☐ 9 degrees left
- d ☐ 6 degrees right

- 15 Which of the following statements is true, concerning the Direct Indicating Compass:

- a ☐ The DIC gives a reading of aircraft true heading
- b ☐ The DIC needs only a small power supply
- c ☐ The DIC is not affected by turns and accelerations
- d ☐ The DIC only reads magnetic headings

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

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

- 17 A gyroscope cannot be perfect, and so over a period of time it becomes inaccurate, this is called:

- a ☐ Gyro wander
- b ☐ Gyro rigidity
- c ☐ Variation
- d ☐ Turn/acceleration error

- 18 As a compass nears the Magnetic North Pole, the compass detector will try to point at the magnetic material inside the Earth. This tilting is called:

- a ☐ Dip
- b ☐ Wander
- c ☐ Drop
- d ☐ Variation

- 19 What principle does an Inertial Navigation System use, to calculate the position of the aircraft:

- a ☐ The navigator must update the Inertial Navigation system all the time
- b ☐ It uses compass heading and doppler values to compute aircraft position
- c ☐ It is set accurately on the ground, and then measures the accelerations in the fore, aft and lateral
- d ☐ A gyroscope feeds position to the computer

- 20 In order to fly in a Visual Circuit, a trainee pilot requires:

- a ☐ Good visibility, and no cloud in the sky
- b ☐ No wind
- c ☐ Good visibility and no wind
- d ☐ Visibility and cloudbase conditions to meet the aerodrome controller's requirements

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

- 22 During periods of poor visibility due to fog, Air Traffic Control will advise the pilot of the slant visibility along the runway. This visibility is measured carefully, and is called:

- a ☐ Runway Range
- b ☐ Runway Visual Range
- c ☐ Radar Visual Range
- d ☐ Glide Slope Visibility

- 23 What problems can be caused by heavy rain:

- a ☐ Runway Visual Range
- b ☐ Heavy snow
- c ☐ Thunderstorms
- d ☐ Restricted visibility and flooded runway

- 24 A flight briefing indicated icing conditions on route. The aircraft has no ice protection. What advice would you give to a novice pilot:

- a ☐ Fly above the cloud
- b ☐ Go slower because the icing will have less effect
- c ☐ Go faster because the icing will have less effect
- d ☐ Plan a near route avoiding icing conditions, or cancel the flight

- 25 Which way does the Earth revolve on its axis:

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