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

2 Your destination airfield is situated due south of your departure airfield. If the two latitudes are 63 25N and 57 58N, how far are they apart:

a ☐ 317nms
b ☐ 333nms
c ☐ 323nms
d ☐ 327nms

3 Rectified Air Speed (RAS) is:

a ☐ Always less than IAS
b ☐ Always the same as IAS
c ☐ Pilot pressure minus static pressure
d ☐ IAS after correction for pressure error and instrument error

4 A Hercules flies from A to B, a distance of 1000nms, at a groundspeed of 250kts. How long does the flight take:

a ☐ 3hrs 30mins
b ☐ 3hrs 20mins
c ☐ 4hrs
d ☐ 5hrs

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

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

6 A Vector is a representation, on paper of:

a ☐ Speed
b ☐ Direction
c ☐ Time
d ☐ Direction and speed

7 In the Air Triangle, the heading vector includes 2 components. They are:-

a ☐ Heading and true air speed
b ☐ Heading and wind velocity
c ☐ Heading and drift
d ☐ Heading and Groundspeed

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

9 An aircraft departs from base, but does not arrive at the destination, on its Estimated Time of Arrival. What action will Air Traffic Control take:

a ☐ Initiate overdue action
b ☐ Contact the departure base
c ☐ Close down
d ☐ No immediate action is required

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

11 An aircraft flies a track made good, 3 degrees in error from the required track. Using the 1 in 60 rule, how many miles will the aircraft be off track after 60 miles of flying:

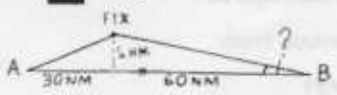
a ☐ 2nms
b ☐ 1nm
c ☐ 3nms
d ☐ 6nms

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

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

13 An aircraft flying from A to B finds that after 30nms, it is 4nms off track. It has a further 60nms to travel. What is the required closing angle:

a ☐ 6 degrees
b ☐ 4 degrees
c ☐ 2 degrees
d ☐ 3 degrees



14 An aircraft when flying from A to B is found to be off track at the pinpoint shown in the diagram. The pilot calculates the track error as 12 degrees and the closing angle of 8 degrees. By how much does the pilot need to turn to reach point B:

a ☐ 4 degrees to the right
b ☐ 12 degrees to the right
c ☐ 8 degrees to the right
d ☐ 20 degrees to the right

15 An aircraft flying from A to B finds that after 30nms it is 4nms left of track. If it has further 40nms to travel, by how much does the pilot need to turn, to regain the intended track at B:

a ☐ 16 degrees to the right
b ☐ 14 degrees to the right
c ☐ 14 degrees to the left
d ☐ 12 degrees to the left

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

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

17 Which of the folowing, is not a component within a Gyro-magnetic system:

a ☐ A flux valve magnetic detector
b ☐ A suspended magnet
c ☐ A gyroscope
d ☐ A turn/acceleration cut out switch

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

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

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 instrument met conditions, which of the following are required:

a ☐ No cloud in the local area
b ☐ An instrument rating only
c ☐ The correct instrumentation, and a suitable pilot instrument rating
d ☐ A clear windscreen canopy

21 Why does an aircraft take off into wind:

a ☐ To decrease the length of take off run
b ☐ To take off at a lower airspeed
c ☐ To use the full length of the runway
d ☐ To increase groundspeed at take off

22 During periods of poor visiblity 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 Visual Range
b ☐ Runway Range
c ☐ Glide Slope Visibility
d ☐ Radar Visual Range

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

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

24 What can be the effects of heavy icing, on an aircraft's performance:

a ☐ It will fly much slower
b ☐ Loss of aerodynamics and reduced engine performance
c ☐ There is no adverse effect on the aircraft's performance
d ☐ Loss of aerodynamics only

25 The latitude of a point is its distance, measured in degrees and minutes:

a ☐ From the true South Pole
b ☐ North or South of the equator
c ☐ East or West of Greenwich
d ☐ From the true North Pole