Headquarters Air Cadets
Examination

Senior Cadet
32/3 Air Navigation
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Serial: 552

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

a ☐ One nm equals 1/10,000 of the distance from the North Pole to the Equator

b ☐ One nm is equal to 5280 feet

c ☐ One nm is equal to one minute of longitude

d ☐ One nm is equal to one minute of latitude

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 ☐ 454nms

b ☐ 453nms

c ☐ 445nms

d ☐ 554nms

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

a ☐ Altitude error

b ☐ Pressure and Instrument error

c ☐ Pressure error only

d ☐ Instrument error only

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

a ☐ 4hrs

b ☐ 3hrs 20mins

c ☐ 5hrs

d ☐ 3hrs 30mins

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

a ☐ Local time

b ☐ British summer time

c ☐ European daylight saving time

d ☐ Greenwich meantime

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

a ☐ The bearing represents knots at all times

b ☐ The bearing represents speed and the length represents direction

c ☐ The length represents mph at all times

d ☐ The bearing of the line represents the direction and the length of the line representing the speed

7 The Air Triangle of velocities can be used to calculate flight data. There are 6 elements in total. How many elements are needed to calculate those missing:

a ☐ 2

b ☐ 6

c ☐ 4

d ☐ 5

8 You are flying in a Tornado at 420kts groundspeed. How many nms do you travel each minute:

a ☐ 6nms

b ☐ 7nms

c ☐ 42nms

d ☐ 8nms

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 ☐ Contact the departure base

b ☐ Close down

c ☐ Initiate overdue action

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 made good

b ☐ Track required

c ☐ Revised track

d ☐ Drift

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 ☐ 4nms

b ☐ 6nms

c ☐ 2nms

d ☐ 60nms

12 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 ☐ 6 degrees

b ☐ 10 degrees

c ☐ 3 degrees

d ☐ 2 degrees

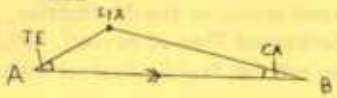
13 An aircraft when flying from A to B is found to be off track at the pinpoint shown in the diagram. The pilot calculates the track error as 12 degrees and the closing angle of 8 degrees. By how much does the pilot need to turn to reach point B:

a ☐ 12 degrees to the right

b ☐ 8 degrees to the right

c ☐ 20 degrees to the right

d ☐ 4 degrees to the right



14 An aircraft flying from A to B finds that after 40nms it is 4nms off track. If it has a further 60nms to travel by how much does the pilot need to turn to regain the intended track at B:

a ☐ 10degrees

b ☐ 4 degrees

c ☐ 6 degrees

d ☐ 12 degrees

15 All RAF aircraft are equipped with a Direct Indicating Compass (DIC). Why is this:

a ☐ The DIC is not affected by turns and accelerations

b ☐ The DIC is the most accurate compass system available

c ☐ The DIC is reliable and needs no power supply

d ☐ The DIC gives a reading of true heading

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

a ☐ A turn/acceleration cut out switch

b ☐ A gyroscope

c ☐ A flux valve magnetic detector

d ☐ A suspended magnet

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

a ☐ Turn/acceleration error

b ☐ Variation

c ☐ Gyro rigidity

d ☐ Gyro wander

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 ☐ Drop

c ☐ Wander

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 is set accurately on the ground, and then measures the accelerations in the fore, aft and lateral

c ☐ A gyroscope feeds position to the computer

d ☐ It uses compass heading and doppler values to compute aircraft position

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

a ☐ Visibility and cloudbase conditions to meet the aerodrome controller's requirements

b ☐ No wind

c ☐ Good visibility and no wind

d ☐ Good visibility, and no cloud in the sky

21 Why does an aircraft take off into wind:

a ☐ To take off at a lower airspeed

b ☐ To use the full length of the runway

c ☐ To increase groundspeed at take off

d ☐ To decrease the length of take off run

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 ☐ Fog is more dense, closer to the ground

b ☐ Fog will appear thicker when on the glide path, because the pilot is looking at a shallower angle

c ☐ The thickest fog always settles at the end of the runway

d ☐ Runway lights are designed to be seen from high level only

23 What problems can be caused by precipitation at freezing temperatures:

a ☐ Fog

b ☐ Icing

c ☐ Thunderstorms

d ☐ Crosswinds

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

a ☐ Lift will decrease and weight will increase

b ☐ The windscreen may freeze over

c ☐ There will be no adverse effect upon the aerodynamics

d ☐ Ice forming on the leading edge of the wing, will increase lift

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

a ☐ From the true South Pole

b ☐ East or West of Greenwich

c ☐ North or South of the equator

d ☐ From the true North Pole