Senior Cadet

32/3 Air Navigation

Generated 17-Jul-01

Serial: 388

Headquarters Air Cadets Examination

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 In Germany, Kiel is due north of Warzburg. If Kiel's latitude is 54 20N and Warxburg's is 49 48N, how far are they apart:

a ☐ 227nm
b ☐ 27.2nm
c ☐ 272nm
d ☐ 2720nm

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

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

3 A Tornado flies from its base to a target in 30 minutes. If the distance is 250nms, what speed is it flying at:

a ☐ 500kts
b ☐ 750kts
c ☐ 125kts
d ☐ 800kts

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

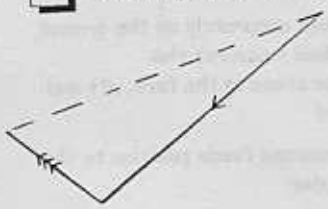
a ☐ European daylight saving time
b ☐ British summer time
c ☐ The time of the country over which the aircraft is flying
d ☐ Greenwich mean time (Universal time)

5 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 speed and the length represents direction
c ☐ The bearing of the line represents the direction and the length of the line representing the speed
d ☐ The bearing represents knots at all times

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

a ☐ Drift and groundspeed
b ☐ Heading and true airspeed
c ☐ Wind velocity
d ☐ Track and groundspeed



7 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 ☐ 360kts
b ☐ 54kts
c ☐ 180kts
d ☐ 280kts

8 Regular checks of Estimated Time of Arrival are important. ETA calculations helps the crew to determine that:

a ☐ The aircraft has sufficient fuel to reach the desination
b ☐ The wind velocity will not change
c ☐ The drift is correct
d ☐ They are flying the shortest route

9 The track drawn on a map, between the departure airfield and the destination is known as:

a ☐ Revised track
b ☐ Track required
c ☐ Track made good
d ☐ Heading required

10 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:

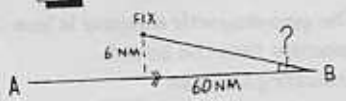
a ☐ 2nms
b ☐ 1nm
c ☐ 6nms
d ☐ 3nms

11 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 ☐ 2 degrees
b ☐ 4 degrees
c ☐ 9 degrees
d ☐ 6 degrees

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 ☐ 3 degrees
b ☐ 10 degrees
c ☐ 2 degrees
d ☐ 6 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 ☐ 8 degrees to the right

b ☐ 20 degrees to the right

c ☐ 12 degrees to the right

d ☐ 4 degrees to the right

14 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 ☐ 12 degrees to the left

b ☐ 14 degrees to the left

c ☐ 14 degrees to the right

d ☐ 16 degrees to the right

15 When would a Direct Indicating Compass be most accurate:

a ☐ In unaccelerated flight

b ☐ In a turn

c ☐ In a steady descent

d ☐ In a steady climb

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

a ☐ When the aircraft climbs or descends, the flux valve takes over from the gyroscope

b ☐ The flux-valve controls the speed of the gyroscope

c ☐ The gyro-magnetic compass is less accurate than the Direct Indicating Compass

d ☐ The gyroscope takes over from the flux valve, whenever the aircraft turns

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

a ☐ Gyro rigidity

b ☐ Gyro wander

c ☐ Variation

d ☐ Turn/acceleration error

18 Where are variation values at their greatest:

a ☐ In the Northern hemisphere

b ☐ In the Southern hemisphere

c ☐ In polar regions

d ☐ At the equator

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

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

b ☐ A gyroscope feeds position to the computer

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

d ☐ The navigator must update the Inertial Navigation system all the time

20 In order to fly in instrument met conditions, which of the following are required:

a ☐ A clear windscreen canopy

b ☐ The correct instrumentation, and a suitable pilot instrument rating

c ☐ No cloud in the local area

d ☐ An instrument rating only

21 The wind is blowing directly down the length of a runway. What is the crosswind component:

a ☐ Zero crosswind component

b ☐ Equal to half the winds speed

c ☐ Equal to the winds speed

d ☐ Equal to 3/4 of wind speed

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

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

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

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

a ☐ Participation

b ☐ IMC

c ☐ Precipitation

d ☐ VMC

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 ☐ Go slower because the icing will have less effect

b ☐ Plan a near route avoiding icing conditions, or cancel the flight

c ☐ Go faster because the icing will have less effect

d ☐ Fly above the cloud

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 ☐ From the true North Pole

d ☐ East or West of Greenwich