EAST AFRICAN SCHOOL OF AVIATION

ATC AERODROME INDUCTION

FINAL

SUBJECT: NAVIGATION

STREAM: ATC COURSE No. 74 **Duration: 2 Hrs**

DATE: 04/05/2017 **TIME 10.40 – 12.40 PM**

INSTRUCTION TO CANDIDATES

1. This paper consists of ***FOUR* (4)** Pages
2. Attempt all questions
3. Read and understand all questions before attempting

1. Define the following terminologies
   a) Rhumb line
   b) Great circle
   c) Meridian
   d) Heading
   e) Equator **(10 Marks)**

2. Fill in the missing values

	Compass	Deviation	Magnetic	Variation	True
(a)	060	3E	_____	9W	_____
(b)	150	2W	_____	7E	_____
(c)	_____	8E	240	4W	_____
(d)	_____	6W	330	2E	_____
(e)	_____	8W	_____	3E	070
(f)	_____	9E	_____	2W	120

(12 Marks)

3.
   a) Define:
      i. Variation
      ii. Deviation **(4 Marks)**

   b) Aircraft is on a compass Heading of 140 degrees magnetic.
      Deviation is 5 degrees East and Variation 9 degrees West

      Calculate:

      i. Magnetic Heading
      ii. True Heading **(6 Marks)**

4.
   a) Control Tower gives an aircraft a QDM of 090 degrees magnetic.
      What is the QDR? **(4 Marks)**

   b) QDR is given as 060 degrees.
      What is the QDM? **(4 Marks)**

c) QDR is 150 degrees magnetic.
The variation is 5 degrees West.

Calculate:

i. QTE
ii. QUJ **(6 Marks)**

5.

a) An aircraft is on a True heading of 060 degrees True.
The pilot observes a town on a relative bearing of 030 degrees Relative

From True North, what is the bearing of the town from the aircraft? **(5 Marks)**

b) Draw the symbols used to show the position of an aircraft as shown below.
i. DR position (Dead Reckoning Position)
ii. Air position
iii. Pin point
iv. Position line **(8 Marks)**

6.

a) True Heading of an aircraft 090 degrees
TAS 180kts

If wind is 090/20

What is Ground Speed? **(5 Marks)**

b) True Heading of an aircraft 270 degrees
TAS 160kts

If wind is 090/10

What is Ground Speed? **(5 Marks)**

c) True Heading of an aircraft 270 degrees
TAS 140kts

If wind is 270/20

What is Ground Speed? **(5 Marks)**

7.

a) True Heading 060 degrees
True Track 050 degrees

What is the Drift Angle? **(4 Marks)**

b) True Heading 100 degrees
Drift Angle is 12 degrees

Port (left)

What is the True Track? **(4 Marks)**

8.

a) The Elevation of an Aerodrome is 5000ft above mean sea level.
An aircraft takes off and climbs to flight level 280.

Rate of climb 2000ft per minute

QNH 1030.2 Hpa

Speed on climb 360kts

Calculate:

i. Altitude of the aircraft at Top of climb.
ii. Height of the aircraft at the Top of climb
iii. Time taken to reach Top of climb (FL 280)
iv. Distance covered on ground when the aircraft reaches FL 280 **(8 Marks)**

b) Point A to B in 120 NM
How many minutes will the aircraft take to cover this distance at a speed of 480 kts?
(5 Marks)

c) An aircraft takes 20 minutes to cover a distance of 100 NM.
What is the speed of the aircraft in knots? **(5 Marks)**