EAST AFRICAN SCHOOL OF AVIATION

ATC COURSE No. 71

FINAL

SUBJECT: AIR NAVIGATION

STREAM: ATC COURSE No. 71 **Duration: 2 Hrs**

DATE: 07/09/2016 **TIME 8.30 – 10.30 AM**

INSTRUCTION TO CANDIDATES

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

1. Define
   a) Heading
   b) Track
   c) Variation
   d) Isogonal
   e) Isoclinal (**10 marks)**

2. Using variation and deviation, fill in the following table

True	Variation	Magnetic	Deviation	Compass
150^0	**5^0W**		**10^0 E**	
	4^0E	**100^0**	**2^0W**	
090^0		**092^0**	**4^0E**	
	2^0W	**117^0**		**120^0**

(16 marks)

3. Use the 1:60 rule to solve the following.

   After flying for 60NM an aircraft is 12NM off track to the port. 24NM remains. Calculate;
   a) Correction angle required to parallel original track
   b) Additional correction angle to converge to destination
   c) If the original track was 100T, what is the new track to destination? **(10 marks)**

4. Use the 1:60 rule to solve the following.

   After flying for 30NM an aircraft is15NM off track to the port. The full distance is 75NM. Calculate;
   d) Correction angle required to parallel original track
   e) Additional correction angle to converge to destination
   f) If the original track was 100T, what is the new track to destination? **(10 marks)**

5. The elevation of Wilson aerodrome is 5,120ft above mean sea level. An aircraft takes off and is climbing to FL280. Rate of climb is 1000ft per minute. Speed on climb is 240KT. QNH is 1009.2Hpa. Using ICAO standard atmosphere pressure of 1013.2Hpa, Calculate,
   a) The altitude of the aircraft at TOC
   b) Height at TOC
   c) Time taken to TOC
   d) Distance covered on ground when the aircraft reaches TOC **(10 marks)**

6. An aircraft flying on a heading of 230^0T. The pilot observes a river on a relative heading of 060 degrees to the port. What is the true bearing of the river? **(5 marks)**

7. On a true heading 160 degrees an aircraft encounters wind of 160/25KT. If TAS is 200KT, what is the ground speed? **(5 marks)**

8. Calculate the time difference that corresponds to the following change of longitude,
   a) 45^0
   b) 60^0
   c) 180^0 **(6marks)**

9. Calculate the change of longitude that corresponds to the following time difference,

   a) 2 hours
   b) 1hr, 30 min
   c) 6 hours **(6 marks)**

10. Calculate;
   a) If LMT is 1900hrs and LD 6th April at long 130 West, what is the GMT and date?
   b) If UTC is 0530hrs on 6th April, what is the LMT and date at long 36 degrees West?
   c) Nairobi is on longitude 45^0E. If LMT is 0200hrs on 2nd April, what is the GMT date and time?
   d) What is the longitude of a place whose GMT time is 0400Z and LMT 0800hrs?

   (12 marks)

11. Draw the symbols that represent the following;
   a) Wind velocity
   b) Track
   c) Heading
   d) DR position
   e) Air position **(5 marks)**

12. Decode the following abbreviations and symbols used in navigation
   a) IAS
   b) Hdg
   c) TAS
   d) Tr
   e) w/v **(5marks)**