

**AIRCRAFT INSTRUMENT**



**EAST AFRICAN SCHOOL OF AVIATION  
DIPOMA IN AERONAUTICAL ENGINEERING  
END OF TERM EXAMINATION**

**SUBJECT: AIRCRAFT INSTRUMENTS AND MEASUREMENTS**

**Stream: MODULE II (AVI)**

**DATE: 11/04/2017**

**TIME: 9.00A.M. TO 12.00P.M.**

**INSTRUCTIONS TO CANDIDATE**

- 1.This paper consists of **EIGHT** questions.
2. All questions carry equal marks.
- 3,Answer **FIVE** questions in the space provided in this paper.

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1. (a) With the aid of a labeled typical design sketch, explain the construction of a pitot tube. (15marks)
- (b) Explain **five** errors that may occur in a pitot static system. (5marks)
2. (a) Describe the principle of operation of an inertial navigation system in an Aircraft. (10marks)
- (b) Outline **two** advantages of INS. (2marks)
- (c) Outline **four** functions of inertia reference system (4marks)
- (d) Explain bounded errors associated with INS and state the **three** main causes. (4marks)
3. (a) Explain each of the following properties for a direct reading compass to function efficiently:
- (i) horizontally;
- (ii) sensitivity;
- (iii) aperiodicity; (15marks)
- (b) Outline **five** checks that should be carried out on a direct reading compass prior to flight. (5marks)
4. Explain with the aid of a diagram the principle operation of a servo altimeter. (20marks)
5. (a) Explain any **five** input of a Ground Proximity Warning System. (15marks)
- (b) During a pre flight check the following details were noted:
- |                                    |        |
|------------------------------------|--------|
| Airport Elevation                  | 5000ft |
| Apron Elevation                    | 4980ft |
| Height of static vent above ground | 25ft   |
| Altimeter reading(QFE)             | 45ft   |
- What is the instrument error? (5marks)
6. (a) Explain with a sketch the principle operation of a **Ring Laser Gyro** (10marks)
- (b) Given the following figures:
- TAS 240KTS
- RATE 1 TURN
- RATE 1 TURN= 2MIN
- (i) What is the radius of the turn?

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(ii) What is the bank angle required for the turn? **(10marks)**

7. (a) State occasions when compass swing is necessary. **(5marks)**

(b) Explain with the aid of a detailed sketch two types of error in a direct reading compass. **(10marks)**

(c) State **FIVE** advantages of the Air Data Computer. **(5marks)**

8. (a) Given the following:

Pressure Altitude(QNE)	11,000ft
QNH Altitude	11,500ft
Temperature	-5 degrees C.
Terrain elevation	1265 Meters.

What is the height of the Aircraft above the Airfield? **(5marks)**

(b) With the main static line being blocked and the pilots opts to use the alternate static line located in the cabin, but the pressure is **10Hpa** lower than the true static. What is the effect on the following Instruments:

(i) Airspeed Indicator

(ii) Altimeter

(iii) Vertical Speed Indicator **(15marks)**