

2507/201

**AIRCRAFT INSTRUMENTS AND  
MEASUREMENT SYSTEMS**

**June/July 2018**

**Time: 3 hours**



**THE KENYA NATIONAL EXAMINATIONS COUNCIL**

**DIPLOMA IN AERONAUTICAL ENGINEERING  
(AVIONICS OPTION)**

**MODULE II**

**AIRCRAFT INSTRUMENTS AND MEASUREMENT SYSTEMS**

**3 hours**

**INSTRUCTIONS TO CANDIDATES**

*You should have the following for this examination:*

*Answer booklet;*

*Drawing instruments;*

*Mathematical tables/Non programmable calculator.*

*This paper consists of **EIGHT** questions.*

*Answer **FIVE** questions in the answer booklet provided.*

*All questions carry equal marks.*

*Maximum marks for each part of a question are as indicated.*

*Candidates should answer the questions in **English**.*

**This paper consists of 2 printed pages.**

**Candidates should check the question paper to ascertain that both pages are printed as indicated and that no questions are missing.**



1. (a) Outline **five** 'precautions and checks' to be observed when replacing gyroscopic instruments. (5 marks)
- (b) Highlight the procedure of carrying out tests on gyroscopic instruments fitted on an aircraft. (5 marks)
- (c) With the aid of a sketch, describe the construction and operation of a basic rate of turn gyroscope. (10 marks)
2. (a) Outline **nine** functions of an ideal central computer fitted in modern aircrafts. (9 marks)
- (b) With the aid of a labelled diagram, describe a basic aircraft maintenance monitor system used in modern aircrafts. (11 marks)
3. With the aid of a fault diagnosis tree, show a logical trouble shooting if the pilot reported that the left hand oxygen system selection was faulty. (20 marks)
4. (a) With the aid of a labelled sketch, show the construction of a gravity sensing vertical gyroscope. (7 marks)
- (b) Outline **ten** occasions that warrant for compass swinging in an aircraft. (10 marks)
- (c) List the major limitations of the direct reading compass. (3 marks)
5. Explain the **four** key ICAO requirements on carriage of flight data recorder equipment. (20 marks)
6. Highlight the procedure of operation of an aircraft periscope. (20 marks)
7. (a) (i) Explain how a vibrating reed type frequency meter functions. (6 marks)
- (ii) State the safety precaution to be observed when a frequency meter is used to measure frequency. (1 mark)
- (b) Highlight the reasons for carrying out each of the following measurements in a circuit:
- (i) current;
- (ii) voltage. (7 marks)
- (c) Outline the safety precautions to be observed when using a digital meter on an aircraft system. (6 marks)
8. (a) With the aid of a labelled sketch, show the dimensioning and measurements that can be taken on a rectangular block with an attachment bolt hole. (6 marks)
- (b) Discuss the origin, approval, application and advantages of the metric system of measurements. (8 marks)
- (c) Explain how the temperature measurement is accomplished stating the ICAO standards. (6 marks)

THIS IS THE LAST PRINTED PAGE.