



**EAST AFRICAN SCHOOL OF AVIATION EXAMINATION**

**DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING**

**(TELECOMMUNICATION OPTION)**

**ELECTRICAL MEASUREMENT AND ANALOGUE ELECTRONICS I**

**STREAM: Module I (Telecom)**

**Duration: 3 Hrs**

**DATE: 07/04/2017**

**TIME: 9-12 PM**

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**INSTRUCTION TO CANDIDATES**

1. *This paper consists of **THREE(3)** pages*
2. *You should have the following for this examination:*
  - i) *Answer booklet*
  - ii) *Mathematical table/ scientific calculator*
3. *Answer **ALL THREE QUESTIONS IN SECTION A** and **ANY TWO IN SECTION B** in this paper*

**SECTION A (ELECTRICAL MEASUREMENT)****Answer ALL THREE questions from this Section.**

1. (a) Define the following terms as used in measurement  
 (i) Absolute unit  
 (ii) Derived unit **(5 marks)**
- (b) Differentiate between fundamental and derived unit **(5 marks)**
- (c) Explain the following types of measurement errors: -  
 (i) Environmental errors  
 (ii) Instrumental errors  
 (iii) Gross errors  
 (iv) Residue errors **(10 marks)**
2. (a) State which unit the following abbreviation refer to :-  
 (i) A (ii) C (iii) J (iv) N (v) W **(5 marks)**
- (b) Express  
 (i) A length of 52 mm in meter  
 (ii) 20,000mm<sup>2</sup> in square meters  
 (iii) 10,000,000mm<sup>3</sup> in cubic meter  
 (iv) 6.3 liters in cubic meter  
 (v) 7.2 tone in kilogram **(15marks)**
3. (a) State three causes of faults on a printed board. (3 marks)
- (b) List five tools used in the repair and maintenance of electronic equipment **(5 marks)**
- (c) Explain three points a service engineer should consider when fault finding on electronic equipment. **(6 marks)**
- (d) Outline three operational objectives and three cost objectives of a good maintenance. **(6 marks)**

**SECTION B (ANALOGUE ELECTRONICS I)****Answer any TWO questions from this Section**

4. (a) Explain the salient feature of Bohr's atomic model. **(4 marks)**
- (b) Draw and explain the V-I characteristics of a *pn* junction. **(6 marks)**
- (c) State **Two** properties of semiconductors. **(4 marks)**
- (d) Explain how the following extrinsic semiconductors are formed.
- i. N- type
  - ii. P- type. **(6 marks)**
- 5.(a) Explain why is the energy of an electron more in higher orbits. **(4 marks)**
- (b) Explain the concept of energy bands in solids. **(6 marks)**
- (c) Discuss the effect of temperature on semiconductors. **(4 marks)**
- (d) State **three** applications of semiconductor diodes **(6 marks)**
- 6.(a) Describe the following with the help of energy level diagram
- (i) Valance band
  - (ii) Conduction band
  - (ii) Forbidden energy gap **(6 marks)**
- (b) Describe the following with the help of energy level diagram;
- (i) Conductor
  - (ii) Insulator
  - (iii) Semiconductor. **(6 marks)**
- (c) Distinguish between the following term as applied in semiconductor;
- (i) Intrinsic and Extrinsic
  - (ii) Majority and Minority Carriers. **(4 marks)**
- (d) State **two** advantages and **two** disadvantages of Semiconductor diodes (or crystal diodes) as compared to the electron-tube counterparts (i.e., vacuum diodes). **(8 marks)**