



C09-EE-105

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BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL—2017

DEEE—FIRST YEAR EXAMINATION

BASIC ELECTRICAL ENGINEERING

Time : 3 hours ]

[ Total Marks : 80

**PART—A**

3×10=30

- Instructions** : (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. State and explain Ohm's Law. 3
2. Define the terms (a) 'specific resistance' and (b) 'conductivity'.  
1½+1½=3
3. Distinguish between (a) copper and (b) aluminium in three aspects. 3
4. Compare magnetic circuit with electric circuit in any three aspects. 3
5. State Lenz's law, and explain the Fleming's right-hand rule.  
1½+1½=3
6. State Faraday's laws of electromagnetic induction. 1½+1½=3
7. State and explain Gauss theorem. 1½+1½=3
8. Explain any three factors that affect the insulating resistance.  
1+1+1=3

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9. State the <sup>\*</sup>bi-metals. 1+1+1=3

10. State the different transistor configurations. 1+1+1=3

**PART—B** 10×5=50

**Instructions :** (1) Answer *any five* questions.  
(2) Each question carries **ten** marks.  
(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (a) Deduce the relation  $R \propto l/a$ .

(b) Determine the resistance of a 600 mt length of aluminium conductor whose rectangular cross-section is 6 cm and 3 cm. Take  $2.826 \times 10^{-8} \Omega\text{-mt}$ . 4+6=10

12. (a) State the requirements of high-resistivity materials. 5

(b) Briefly explain the process of galvanizing and impregnation.  $2\frac{1}{2}+2\frac{1}{2}=5$

13. (a) Explain the mechanical equivalent of heat.

(b) An electric kettle is marked 500 W, 230 V and is found to take 20 minutes to raise 1 kg of water from 15 °C to boiling point. Calculate the efficiency of the kettle. 5+5=10

14. (a) State the Fleming's left-hand rule.

(b) Develop the expression for the force between two parallel current carrying conductors. 2+8=10

15. Derive the expressions for self- and mutual inductances. 5+5=10

16. (a) Derive the equivalent capacitance for three capacitors connected in series. 5+5=10
- (b) Three capacitors having capacitances of 10 F, 30 F and 90 F are connected in parallel across 220 V DC. Find the equivalent capacitance and the charge on each capacitor.
17. Explain the properties and applications of PVC. 5+5=10
18. (a) Distinguish between *P*-type and *N*-type semiconductors.
- (b) Explain the operation of Zener diode. 4+6=10

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