

ELECTRICAL ENGINEERING MATERIAL

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) Define specific resistance. 2
- (b) Mention the physical factors on which resistance depends. 4
- (c) How resistance depends on temperature? Explain. 3
- (d) What are the advantages and disadvantages of aluminium as compared to copper for use as a conducting material? 5

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2. (a) Differentiate the conductor, semi-conductor and insulator on the basis of energy level diagram. 8



(b) Write down the characteristics of the following semi-conductor material. 3+3=6

- (i) Germanium (ii) Silicon

3. (a) Define the following : 4x2=8

- (i) Permeability (ii) Coercive force,
- (iii) Curie point, (iv) Reluctance.

(b) Draw and explain the hysteresis loop for hard steel, wrought iron and alloyed steel. 6

4. (a) What is fuse ? Where and why it is used ? 4

(b) What is soldering ? Write shortly on various methods of soldering. 2+5=7

(c) What are the merits of semi-conductor material used in electrical industry ? 3

5. (a) What is PCB ? Describe briefly on etching technique of P.C.B. 2+4=6

(b) Write down the properties of insulating material. 5

(c) Classify the insulating material. 3

6. (a) Classify the magnetic material with example. 5

(b) What are the factors affecting ceramics ? 5

(c) Explain briefly the intrinsic and extrinsic semi-conductors. 4

7. Write short notes on any four : 3 1/2 x 4 = 14

- (i) P-N Junction
- (ii) Non-destructive test
- (iii) Hard and soft magnetic materials
- (iv) Magnetostriction
- (v) Superconductor
- (vi) ACSR.