

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) Write down the properties and uses of the following materials : $3 \times 3 = 9$

(i) Copper

(ii) Tungsten

(iii) Eureka

- (b) What is resistivity? Mention its unit. On what factors that affect the value of resistivity?

$2 + 1 + 2 = 5$

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2. (a) Define permeability, reluctance and coercive force. 3
- (b) What are the differences between soft and hard magnetic material ? 3
- (c) Draw the hysteresis loop for hard steel, wrought iron and alloyed steel. 3
- (d) Define dia-magnetic, para-magnetic and ferro-magnetic material. 3
3. (a) Write down the properties of an ideal insulating material. 3
- (b) Classify the insulating material on the basis of their operating temperature. 3
- (c) Write down the application of the following insulating materials — Porcelain and Wood. 2
- (d) Write short notes on impregnation and hygroscopicity. 4
4. (a) Explain semiconductor on the basis of energy level diagram. 2
- (b) Write down the characteristics of germanium as semiconductor material. 3

- (c) State the use of semiconductor. 3
- (d) Describe briefly the process of preparing the P.C.B. 4
5. (a) Define fuse. 2
- (b) Why is fuse used ? 2
- (c) What is solder and why is it used ? 2
- (d) Describe various types of soldering techniques. 4
- (e) Why are fluxes used ? 2
6. (a) What are the properties to be possessed by constructional materials used in electrical engineering ? 2
- (b) Mention different types of pole and tower used for carrying overhead transmission line. 3
- (c) What are the various methods of non-destructive test ? 3