

Total No. of printed pages = 6

END SEMESTER EXAMINATION – 2020

Subject Code : CAI-405

**ELECTRONIC COMPONENTS AND
MATERIALS**

Full Marks : 70

Time : Three hours

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

PART – A

Marks – 25

1. Determine the correct options for the following questions : 1×10=10
- (i) For n-type semiconductor impurity type is
- (a) Acceptor (b) Donor
- (c) May be both (d) None of these
- (ii) If the length of a wire is halved, its resistance becomes
- (a) one-fourth (b) half
- (c) twice (d) four times

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(iii) If an IC contains 101 components on it the IC will fall in which category ?

- (a) SSI (b) MSI
(c) LSI (d) VLSI

(iv) The non-linear variation of magnetic flux (B) with magnetizing force (H) during magnetization and demagnetization is known as

- (a) Piezoelectricity (b) Magnetostriction
(c) Hysteresis (d) None of these

(v) For metals the temperature coefficient (α_p)

- (a) Negative
(b) Zero
(c) Positive
(d) May be positive or may be negative

(vi) Which of the following is a common application of Tungsten ?

- (a) PCB fabrication (b) Batteries
(c) Transformer coils (d) Filament.



(vii) Nichrome contains

- (a) 2% chromium (b) 12% chromium
(c) 22% chromium (d) 32% chromium

(viii) ICs in which all the components are fabricated together on a single chip are called as

- (a) Digital (b) Hybrid
(c) Monolithic (d) Linear

(ix) The units of μ_0 and μ_r are

- (a) H/m for both
(b) H/m for μ_r and no units for μ_0
(c) H/m for μ_0 and no units for μ_r
(d) Wb/m for μ_0 and no units for μ_r

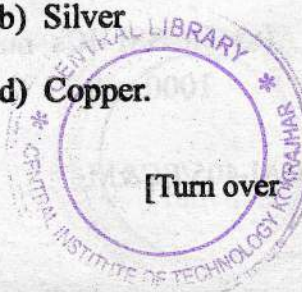
(x) Which of the following material is used for temperature measurement ?

- (a) Platinum (b) Silver
(c) Gold (d) Copper.

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2. State whether the following statements are true or false : $1 \times 10 = 10$

- (i) Ceramic materials are made from clay.
- (ii) Both Silicon and Germanium are used as semiconductors.
- (iii) The phenomenon of conversion mechanical energy into magnetic flux and vice versa is known as magnetostriction.
- (iv) The conductivity of a material depends on purity of the material.
- (v) Copper is used in making PCBs.
- (vi) At a very low temperature, a semiconductor becomes an insulator.
- (vii) Hard ferromagnets are used in transformer.
- (viii) Gallium Arsenide is a semiconductor.
- (ix) Soft ferromagnet remains magnetized even after removal of magnetizing force.
- (x) In SSI ICs number of components is 100-1000.

3. Fill in the blanks : 1×5=5

- (i) Nickel is a _____.
- (ii) If a conductor is used for a long duration, its resistivity _____.
- (iii) A transformer works on the principle of _____.
- (iv) Dielectric loss is directly proportional to _____.
- (v) Bakelite is an _____.

PART – B


Marks – 45

- 4. State the intrinsic and extrinsic factors affecting conductivity of a material. 10
- 5. Explain the manufacturing process of a carbon film resistor. 8
- 6. Give the general comparison of metal/alloy film resistor, metal oxide resistor and carbon film resistor. 5
- 7. What are self inductance and mutual inductance? How they are related? 7

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(5)

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8. Write short notes on : $5 \times 3 = 15$

(a) High resistivity alloys

(b) Classification of IC

(c) Ceramic materials.

