

B.E./B.TECH. Degree Examination, January 2021

Semester – II

**PH16251- Engineering Physics II**

(Regulation 2016)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions**PART A - (8 X 2 = 16 marks)**

1. The Microscopic ohms law is given by (a)  $J = \sigma E$  (b)  $J = \sigma/E$  (c)  $V = IR$  (d)  $V = I/R$
2. What is the effect of temperature on conductivity of semiconducting materials? (a) Increases (b) Decreases (c) has no effect (d) Distorts the material.
3. SQUID works on the principle of  
(a) Meissner effect (b) Josephson junction effect  
(c) Peltier effect (d) Isotope effect
4. The metallic glasses have high resistant to corrosion due to \_\_\_\_\_ of atoms  
(a) Random ordering (b) regular Ordering (c) Impurity (d) Reactivity
5. List the drawbacks of classical free electron theory.
6. Graphically represent the effect of temperature on conductivity of P-type semiconductor.
7. What is the effect of frequency on polarization?
8. What is birefringence?

**PART B - (4 X16 = 64 marks)**

09. (a) Derive an expression for density of states. Hence, deduce the expression for carrier concentration in metals. **(16)**

**(OR)**

- (b) Obtain an expression for density of electrons in conduction band of n-type semiconductor. **(16)**

10. (a) (i) Describe the structure of Ferrites and mention its properties and applications. **(10)**  
(ii) Distinguish between soft and hard magnetic materials. **(6)**

**(OR)**

- (b) (i) Explain the High  $T_C$  superconductors, in detail, with examples. **(8)**  
(ii) Discuss the applications of superconductors based on its Properties. **(8)**

11. (a) Discuss the different types of Polarisation mechanism involved in a dielectric material. What is the effect of temperature on Polarisation? **(16)**

**(OR)**

- (b) What is Internal field in solids. Derive an expression for the Lorentz field for (16)  
elemental dielectrics.

12. (a) (i) Explain the following methods of producing carbon nanotubes. (16)

(a) Pulsed laser deposition method.

(b) Chemical vapour deposition method.

**(OR)**

- (b) (i) Give a detailed account on metallic glasses, their method of production, types (10)  
and applications.

- (ii) Explain the applications of Biomaterials in the field of medicine. (6)