

CODE: 17CA55101

B. Tech I Year I Semester (R17) Supplementary Examinations, February 2018

ENGINEERING PHYSICS

(Common to CSE & EEE)

Time: 3 hours

Max Marks: 70

PART – A

1. Answer any **ten** questions (10 x 2 = 20 Marks)

- (a) Write the significant properties of LASER light
- (b) Define the terms numerical aperture and acceptance cone
- (c) What are the conditions for interference of light?
- (d) Define atomic packing factor and coordination number
- (e) Calculate the interplanar spacing for (3 2 1) plane. Given that $a = 3.592 \text{ \AA}$
- (f) What is de Broglie hypothesis
- (g) State the postulates of classical free electron theory
- (h) What is energy Eigen values and Eigen functions?
- (i) What is the difference between drift and diffusion current?
- (j) What is a soft magnetic material? Give the examples
- (k) What is Meissner effect in superconductors
- (l) What is a nano composite material?

PART - B

Answer all five units (5 x 10 = 50 Marks)

UNIT-I

2. (a) Explain the theory of Newton's rings in detail.
- (b) Describe the condition for laser action.

OR

3. (a) Explain the construction and working of He-Ne laser.
- (b) Explain briefly block diagram of optical fiber communication system with diagram.

UNIT-II

4. Derive the general expression for interplanar spacing for a set of parallel planes characterized by Miller indices (h k l) and reduce it to cubic system.

OR

5. (a) Explain applications of non destructive testing using ultrasonic's waves.
- (b) Determine the packing fraction for simple cubic and bcc lattices.

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UNIT-III

6. (a) Derive time independent one dimensional Schrodinger's wave equation.
(b) Discuss merits of quantum free electron theory of metals.

OR

7. (a) Define Fermi-Dirac distribution function. Explain how $f(E)$ varies at $T=0$ K and $T>0$ K with energy. Sketch the variation.
(b) What is free electron? An electron is bound in one dimensional potential well of width 0.12 nm. Find the energy values in the ground state and also first two excited states in eV.

UNIT-IV

8. (a) What is Hall Effect? Derive the expression for Hall voltage and Hall coefficient in an n- type semiconductor.
(b) What are semiconductors?

OR

9. (a) Discuss the classification of magnetic materials.
(b) Define magnetic flux density, magnetic susceptibility and magnetic permeability.

UNIT-V

10. (a) Discuss Type-I and Type-II superconductors with diagrams.
(b) Explain briefly Josephson Effect in superconductors.

OR

11. (a) Discuss properties of nonmaterial in different discipline.
(b) Explain briefly quantum nature of the nano world.
