Code No: 51004 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year Examinations, July - 2021
ENGINEERING PHYSICS
(Common to CE, EEE, ME, ECE, CSE, IT, AE, BT, AME, MIE)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

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1.a) Derive an expression for the calculation of cohesive Energy of a solid.
b) Calculate the packing factor for a FCC lattice.
c) Explain the structure of ZnS. [7+3+5]

2.a) Describe the Laue method to determine the structure of a material and also mention drawbacks of laue method.
b) What are Shottky and Frenkel defects? Explain the surface and volume defects. [7+8]

3.a) Distinguish between Bose – Einsterin (B-E) and Fermi – Dirac (F-D) statistics Qualitatively.
b) Derive Schroedinger's time independent wave Equation. [7+8]

4.a) Explain Kronig – Penney model qualitatively. Explain the concept of effective mass of an electron.
b) Explain origin of energy band formation in solids. [8+7]

5.a) Derive the expression for carrier concentration in n-type semiconductor.
b) Explain the P-N diode equation. Describe the construction and working of LED. [7+8]

6.a) Define electric dipole, dipole moment and dielectric constant. Derive the expression for electronic Polarizability.
b) Explain the origin of magnetic moment. Distinguish between soft and hard magnetic materials. [7+8]

7.a) What are the characteristics of lasers?
b) Describe the construction and working of He –Ne Laser.
c) Describe the classification of fibers. [5+5+5]

8.a) What are the factors affect the architectural acoustics and suggest corresponding remedies.
b) Define the significance of surface to volume ratio. Explain the synthesis of nano material by Sol – Gel method.
c) Write short notes on methods of quieting. [5+5+5]

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