Code No: 51004

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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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