

**R09**

Code No: 51004

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year Examinations, December - 2017

ENGINEERING PHYSICS

(Common to CE, EEE, ME, ECE, CSE, CHEM, EIE, BME, IT, MCT, AE, BT, AME, MIE, PTM, AGE)

Time: 3 hours

Max. Marks: 75

Answer any five questions  
All questions carry equal marks

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- 1.a) Plot and explain the variation of i) attractive potential energy ii) repulsive potential energy iii) resultant potential energy with inter-atomic distance, when two atoms are brought nearer.
- b) Show that packing fraction of FCC is more than BCC and SC crystals. [8+7]
- 2.a) Derive Bragg's law of X-ray diffraction.
- b) With neat diagrams, write notes on dislocations in crystals. [7+8]
- 3.a) What are the basis postulates of Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics?
- b) Explain the physical significance of wave function.
- c) Derive time independent Schrodinger's wave equation. [6+4+5]
- 4.a) Show that the Kronig-Penney model leads to energy band structure in solids.
- b) What is effective mass of an electron? Derive an expression for the effective mass of an electron. [9+6]
- 5.a) What is Hall effect? Derive an expression for Hall coefficient for p-type semiconductor.
- b) Explain how a PN junction diode acts as a LED. [8+7]
- 6.a) Discuss in detail the domain theory of ferro magnetism on the basis of Hysteresis curve.
- b) Derive an expression for Clausius - Mossotti Equation. [7+8]
- 7.a) Describe the principle, construction and working of a semiconductor laser.
- b) Describe different types of optical fibers by giving the refractive index and propagation details. [8+7]
- 8.a) Mention the basic requirements of acoustically good hall.
- b) With neat diagram, explain fabrication of nano-materials by using Chemical Vapour Deposition method. [8+7]

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