

**I B. Tech I Semester Regular Examinations, January, 2015****Engineering Physics  
(Common to BME, EEE, CSE, IT)****Time: 3 hours****Max Marks: 70****PART – A  
Answer ALL questions  
All questions carry equal marks  
\*\*\*\*\*****2 \* 10 = 20 Marks**

- 1). a Find the Miller indices of a plane having intercepts a, 3b, 2c along crystallographic axes x, y, z. [2]
- b Explain the physical significance of Wave Function. [2]
- c Explain Frenkel and Schottky Defects. [2]
- d Discuss the failures of Classical Free Electron Theory. [2]
- e Write a note on Piezoelectricity. [2]
- f What are Soft and Hard Magnetic Materials? [2]
- g Explain the following [2]  
(i) Meta Stable State (ii) Population Inversion
- h Explain attenuation in Optical Fibers. [2]
- i Briefly explain [2]  
(i) Nano Materials (ii) Surface to Volume ratio
- j Discuss any two applications of Nano materials. [2]

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**PART – B**  
**Answer any FIVE questions**  
**All questions carry equal marks**  
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**10 \* 5 = 50 Marks**

2. a) Show that FCC crystals are closely packed than BCC and SC crystals by working out the packing factors. [5]  
b) Derive an expression for Schrodinger's Time Independent wave equation. [5]
3. a) Discuss the motion of an electron in a periodic potential. [5]  
b) What is Hall Effect? Derive an expression for Hall Effect. [5]
4. a) Derive an expression for internal fields in solids. [6]  
b) Explain Hysteresis curve on the basis of Domain Theory of Ferromagnetism. [4]
5. a) Derive the relation between Einstein's coefficients. [6]  
b) Explain Optical Fiber Communication Link with block diagram. [4]
6. a) Describe any three processes by which Nano Materials are fabricated. [6]  
b) Explain the Scanning Electron Microscopy. [4]
7. a) Write a note on Edge and Screw dislocations and explain the significance of Burger's Vector. [5]  
b) Derive an expression for effective Mass of Electron. [5]
8. a) Discuss different types of Polarizations in Dielectrics. [5]  
b) Derive an expression for Acceptance Angle and Numerical Aperture of an Optical Fiber. [5]

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