

Code No: 51004**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech I Year Examinations, September/October - 2021****ENGINEERING PHYSICS****(Common to CE, EEE, ME, ECE, CSE, IT, MIE)****Time: 3 Hours****Max. Marks: 75****Answer any five questions
All questions carry equal marks**

- 1.a) Define space lattice, lattice parameters and unit cell.
- b) Discuss about seven crystal systems and their corresponding Bravais lattice. [7+8]
- 2.a) State and explain about Bragg's law.
- b) Explain determination of structural parameters of crystals using powder method. [7+8]
- 3.a) Compare M-B, B-E and F-D statistics.
- b) Derive an expression for time independent Schrodinger wave equation.
- c) Write short notes on concept of electron gas. [5+5+5]
- 4.a) Explain Energy Band formation in Solids.
- b) Derive an expression for effective mass of an electron. [7+8]
- 5.a) Find the position of Fermi level in n-type semiconductor.
- b) Write short notes on direct and indirect band gap semiconductors. [7+8]
- 6.a) Derive expressions for electronic and ionic polarizations.
- b) Explain classification of magnetic materials on the basis of magnetic moment. [8+7]
- 7.a) Discuss about spontaneous and stimulated emissions.
- b) Establish relation between Einstein coefficients.
- c) Write few applications of lasers. [4+7+4]
- 8.a) Define reverberation and time of reverberation.
- b) Write short notes on aspects of acoustic quieting. [7+8]

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