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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)**B.Tech I Year I Semester Supplementary Examinations July-2022****ENGINEERING PHYSICS**

(Common to CE, AGE, EEE &amp; ME)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)**UNIT-I**

- 1 a Explain the construction and working of Nd:YAG laser with suitable energy level diagram. **8M**
- b What are the advantages of Nd:YAG laser? **4M**

**OR**

- 2 a What is the acceptance angle of an optical fibre and derive an expression for it. **8M**
- b An optical fibre has a core refractive index of 1.44 and cladding refractive index of 1.40. Find its numerical aperture and  $\theta_a$ . **4M**

**UNIT-II**

- 3 a Deduce the expression for the inter planar distances in terms of miller indices for a cubic system. **9M**
- b Draw miller indices of planes (1 0 0), (1 0 1) and (0 1 1). **3M**

**OR**

- 4 a Define Reverberation and Reverberation time. **4M**
- b What are the basic requirements of acoustically good hall? **8M**

**UNIT-III**

- 5 a Derive Schrödinger's time independent wave equation. **8M**
- b An electron is moving under a potential field of 15kv. Calculate the wavelength of electron wave. **4M**

**OR**

- 6 a Derive an expression for electrical conductivity in a metal using Quantum Free Electronic theory. **8M**
- b Write its advantages over classical free electron theory. **4M**

**UNIT-IV**

- 7 a Describe the Hall effect in a semiconductor. **8M**
- b Write the applications of Hall effect. **4M**

**OR**

- 8 a Explain B-H curve of ferromagnetic material. **8M**
- b A magnetic material has a magnetization of 3300 A/m and flux density of 0.0044 Wb/m<sup>2</sup>. Calculate the magnetizing force and relative permeability of the material. **4M**

**UNIT-V**

- 9 a Explain the types of superconductors. **8M**
- b A superconducting material has a critical temperature of 3.7K and a magnetic field of 0.0306T at 0K. Find the critical field at 2K. **4M**

**OR**

- 10 a What are the techniques available for synthesizing nanomaterials? **4M**
- b Explain ball milling technique for synthesis of nanomaterial. **8M**

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