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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations November-2020

ENGINEERING PHYSICS

(Common to CE, EEE, ME & AGE)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

1 a Summarize the construction and working mechanism of He-Ne laser with neat energy level diagram. **8 M**

b Write a short note on population inversion. **4 M**

OR

2 a What is acceptance angle? Derive the expression for acceptance angle of an optical fiber. **8 M**

b An optical fiber has core and cladding refractive indices 1.445 and 1.402 respectively. Estimate acceptance angle and numerical aperture of an optical fiber. **4 M**

UNIT-II

3 a Evolve the expression for the interplanar spacing in terms of miller indices for a cubic crystal. **7 M**

b State and explain Bragg's law of X-ray diffraction. **5 M**

OR

4 a Explain the detection techniques of Ultrasonic waves. Give the properties of Ultrasonic waves. **8 M**

b Define reverberation and reverberation time. **4 M**

UNIT-III

5 a List the properties of matter waves. **3 M**

b Describe the behavior of a particle in one dimensional infinity potential well of width 'L' in terms of eigen function and eigen values. **9 M**

OR

6 a Explain the origin of bands in solids. **6 M**

b Classify the solids into conductors, semiconductors and insulators based on band theory of solids. **6 M**

UNIT-IV

7 a What is diffusion? Describe the diffusion process in semiconductors. **8 M**

b The R_H of the specimen is $3.64 \times 10^{-4} \text{ m}^3 \text{C}^{-1}$. Its resistivity is $8.95 \times 10^{-3} \Omega \text{m}$. Find the mobility and charge carrier concentration. **4 M**

OR

8 a Define the following (i) magnetic moment (ii) magnetic permeability (iii) magnetic susceptibility. **6 M**

b Distinguish between soft and hard magnetic materials. **6 M**

UNIT-V

9 a State and explain Meissner's effect. **6 M**

b Explain the BCS theory of superconductors. **6 M**

OR

10 a Summarize the basic principles of nanomaterials. **8 M**

b List the applications of nanomaterials. **4 M**

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