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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**B.Tech I Year II Semester Regular Examinations October-2020****APPLIED PHYSICS****(Electrical & Electronics Engineering)**

Time: 3 hours

Max. Marks: 60

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

- 1 a Define simple harmonic motion. Give three examples. **4M**
b Derive the equation of motion of simple harmonic oscillator and find its solution. **8M**

OR

- 2 a Explain logarithmic decrement, relaxation time and quality factor of an oscillator. **9M**
b The amplitude of a second pendulum falls to one half of its initial value in 150 seconds. Calculate the Q factor. **3M**

UNIT-II

- 3 a Explain the concept of matter waves. **2M**
b Derive Schrodinger time dependent wave equation. **10M**

OR

- 4 a Explain de Broglie hypothesis. **6M**
b Illustrate Heisenberg uncertainty principle and write its significance. **6M**

UNIT-III

- 5 a Describe the quantum free electron theory of metals. **8M**
b Write the advantages of quantum free electron theory over classical free electron theory. **4M**

OR

- 6 a What is Hall Effect? Obtain an expression for Hall coefficient. Write the applications of Hall Effect. **8M**
b The R_H of a specimen is $3.66 \times 10^{-4} \text{ m}^3 \text{c}^{-1}$. Its resistivity is $8.93 \times 10^{-3} \text{ ohm-m}$. Find ' μ ' and ' n '. **4M**

UNIT-IV

- 7 a Write the characteristics of Lasers. **4M**
b Explain the construction and working of He-Ne laser with a neat diagram. **8M**

OR

- 8 a Outline the optical fiber communication system. **8M**
b Write any four applications of optical fibers. **4M**

UNIT-V

- 9 a Define Nano science and nanotechnology. **4M**
b Explain the basic principles of Nano-materials. **8M**

OR

- 10 a Explain the synthesis of nanomaterial's by ball milling method. **8M**
b Discuss the advantages of Nano-materials. **4M**

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