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

B.Tech I Year I Semester Supplementary Examinations June 2019

PHYSICS

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

- 1 a State Ampere's law in magneto statics. 2M
- b How we protect our self from harmful effects of electromagnetic radiation? 2M
- c A class room of volume 200 m^3 has a reverberation time 1.6 seconds. Calculate the total sound absorption coefficient of the class room. 2M
- d What is life time of an atom in excited state? Give the life time of Hydrogen atom in excited state. 2M
- e What is quantum confinement? 2M

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

- 2 a State and write Maxwell's equation in differential form. 5M
- b Derive the continuity equation and write its significance. 5M

OR

- 3 a Classify the magnetic materials based upon spin magnetic moments. 7M
- b A magnetic material has a magnetization of 3300 A/m and flux density of 0.0044 Wb/m^2 . Calculate the magnetizing force of the material. 3M

UNIT-II

- 4 Deduce the relation between the Electric (E) and Magnetic (B) fields of electromagnetic waves. 10M

OR

- 5 a Compare electromagnetic waves and sound waves. 6M
- b Explain the electromagnetic spectrum. 4M

UNIT-III

- 6 a Derive general differential equation of motion for a simple harmonic oscillator and obtain its solution. 7M
- b Name the periodic motion which is not oscillatory. 3M

OR

- 7 a Describe the formation of Newton's ring with necessary theory. 10M

UNIT-IV

- 8 a List out the characteristics of laser. 3M
- b Explain the construction and working principle of He-Ne laser with suitable energy level diagram. 7M

OR

- 9 a Explain the difference between spontaneous and stimulated emission of radiation. 4M
- b Write short note on applications of lasers in science and engineering. 6M

UNIT-V

- 10 a Define top down and bottom up process. 3M
- b Explain Sol-Gel technique for synthesis of nanomaterial. 7M

OR

- 11 a What are carbon nanotubes? Mention its structures. 5M
- b Discuss the sensor and catalyst applications of carbon nanotubes. 5M

END