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

B.Tech I Year I Semester Regular Examinations December 2018

PHYSICS

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

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

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|---|--|----|
| 1 | a State Biot- Savart law. | 2M |
| | b Write any four properties of electromagnetic wave. | 2M |
| | c What are the characteristics of simple harmonic oscillation? | 2M |
| | d Write any two differences between laser beam and ordinary light beam. | 2M |
| | e Find the surface area to volume ratio of sphere for the given radius is 5 meter. | 2M |

PART-B

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

UNIT-I

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|---|---|----|
| 2 | a Derive and explain Gauss law in electrostatics. | 7M |
| | b If a point charge q is placed at the center of a cube what is the flux linked with the cube and with the each face of the cube? | 3M |

OR

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|---|---|----|
| 3 | a Explain hysteresis curve of ferromagnetic material. | 6M |
| | b Distinguish hard and soft magnetic materials. | 4M |

UNIT-II

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| 4 | a Derive an expression for energy carried by electromagnetic waves. | 10M |
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OR

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| 5 | a Show that the electromagnetic waves are transverse in nature. | 7M |
| | b What are the uses of various radiation of electromagnetic spectrum? | 3M |

UNIT-III

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| 6 | a Define Reverberation and Reverberation time. | 4M |
| | b What is the basic requirement of acoustically good hall? | 6M |

OR

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| 7 | a Discuss Fraunhofer single slit diffraction. | 7M |
| | b Draw intensity distribution curves and give condition for bright and dark fringes in single slit diffraction pattern. | 3M |

UNIT-IV

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| 8 | a Derive the relation between the various Einstein's coefficients of absorption and emission of radiation. | 7M |
| | b Explain any three types of pumping mechanisms. | 3M |

OR

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| 9 | 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? | 2M |

UNIT-V

- 10 a Define top down and bottom up process. 3M
b Explain ball milling technique for synthesis of nano materials. 7M

OR

- 11 a Explain different types of carbon nanotubes. 5M
b Write brief note on applications of carbon nanotubes. 5M

END