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

B.Tech I Year I Semester Regular Examinations December 2018

PHYSICS

(EEE)

Time: 3 hours

Max. Marks: 60

PART-A

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

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|----------|------------------------------------------------------------------------------|----|
| 1 | a Derive the differential equation for damped oscillator. | 2M |
| | b What is population Inversion? | 2M |
| | c Mention any two applications of Heisenberg's uncertainty Principle. | 2M |
| | d Define Drift velocity. | 2M |
| | e What is carbon Nano tube? | 2M |

PART-B

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

UNIT-I

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|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 2 | a What are damped oscillations? Derive the equation of motion and solution of damped oscillator. | 7M |
| | b An under damped oscillator has its amplitude to (1/10) th of its initial value after 100 oscillations. If time period is 2 seconds, Calculate 1) the damping constuting 2) the decay modulus. | 3M |

OR

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|----------|-----------------------------------------------------------------------------------------------|----|
| 3 | a Determine the electrical analogy for in a simple oscillator? | 4M |
| | b Describe the equation of electrical oscillator in terms of inductance & capacitance? | 6M |

UNIT-II

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|----------|------------------------------------------------------|----|
| 4 | a Explain the characteristics of laser light. | 4M |
| | b Describe the optical resonator. | 6M |

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|----------|--------------------------------------------------------------|----|
| 5 | a Explain the constructions & working of He-Ne laser. | 8M |
| | b Mention the advantages of He-Ne laser. | 2M |

UNIT-III

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|----------|-------------------------------------------------------------------------------------------|----|
| 6 | a Explain the properties of matter waves? | 6M |
| | b Calculate the wave length associated with an electron raised to potential 2500V? | 4M |

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|----------|----------------------------------------------------------------------|----|
| 7 | a Derive Schrodings time independent wave equation. | 7M |
| | b Explain the Physical significance of wave function Ψ . | 3M |

UNIT-IV

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|----------|-------------------------------------------------------------------------------------|----|
| 8 | a Explain quantum free electron theory. | 6M |
| | b What are the advantages and disadvantages of quantum free electron theory? | 4M |

OR

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|----------|-------------------------------------------------------------------------------------------------------------------------------|----|
| 9 | a Drive Einstein, relations for a semiconductor. | 7M |
| | b In an Intrinsic semiconductor the energy gap is 1.2ev. What is the ratio between conductivities at 600K and at 300K? | 3M |

UNIT-V

- 10 a** Describe the synthesis of nanomaterial by ball mill. 7M
b Write the applications of Nano materials. 3M

OR

- 11 a** What are the difference between Nano technology and Nano science. 5M
b Mention the properties of CNT. 5M

END