R19

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester (R19)Supplementary Examinations July-2022
SEMICONDUCTOR PHYSICS
(Common to CSE & CSIT)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

1	a	Describe the electrical conductivity in a metal using quantum free electronic theory.	**L1**	**8M**
	b	Write advantages of quantum free electron theory over classical free electron theory.	**L2**	**4M**

OR

2	a	Classify the solids into conductor, semiconductor and insulators based on band theory.	**L4**	**8M**
	b	Evaluate Fermi Function for energy K_BT above Fermi level?	**L2**	**4M**

UNIT-II

3	a	Distinguish between intrinsic and extrinsic semiconductors.	**L4**	**8M**
	b	Determine the wavelength of LED fabricated by the CdS material with band gap of 2.42eV.	**L1**	**4M**

OR

4	a	Describe the construction and working mechanism of Photodiode.	**L4**	**8M**
	b	Write the applications of Hall Effect.	**L5**	**4M**

UNIT-III

5	a	Derive Schrödinger's time independent wave equation.	**L1**	**8M**
	b	Explain the physical significance of wave function.	**L4**	**4M**

OR

6	a	Write the significance of Divergence and Curl of Electromagnetic fields	**L5**	**8M**
	b	Describe Wave & Particle Nature of Matter Waves.	**L4**	**4M**

UNIT-IV

7	a	Describe the construction and working principle of He-Ne Laser with the help of a neat diagram.	**L4**	**8M**
	b	Calculate the wavelength of emitted radiation from GaAs which has a band gap of 1.44eV ?	**L1**	**4M**

OR

8	a	Describe the construction and the working principle of optical fibre.	**L4**	**8M**
	b	Mention applications of optical fibres.	**L5**	**4M**

UNIT-V

9	a	Explain the concept of Quantum Confinement in nano materials.	**L4**	**6M**
	b	What is Graphene? Write brief note on its properties.	**L5**	**6M**

OR

10	a	Explain Sol-Gel technique for synthesis of nanomaterial.	**L4**	**8M**
	b	Write the applications of nanomaterial in various fields.	**L5**	**4M**

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