SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
BTECH I Year I Semester Supplementary Examinations November-2021
APPLIED PHYSICS
[Common to CSE, CSE (AI & ML), CSE (IOT) & CSIT]

Time: 3 hours

Max. Marks: 60

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

UNIT-I

1	a	Describe the formation of Newton's ring with necessary theory with relevant diagram and derive the expressions for dark and bright fringes.	L3	9M
	b	In a Newton's rings experiment, the diameter of the 5th ring is 0.30 cm and the diameter of the 15th ring is 0.62 cm. Calculate the diameter of the 25th ring.	L4	3M

OR

2	a	Explain the theory of Fraunhofer diffraction due to single slit.	L4	8M
	b	Obtain conditions for bright and dark fringes in single slit diffraction pattern and draw intensity distribution.	L4	4M

UNIT-II

3	a	Describe the electrical conductivity in a metal using quantum free electronic theory.	L3	8M
	b	Write advantages of quantum free electron theory over classical free electron theory.	L1	4M

OR

4	a	State and Explain Gauss's theorem for divergence and Stoke's theorem for curl.	L4	12 M

UNIT-III

5	a	Describe the construction and working principle of Nd: YAG laser with the help of a neat diagram.	L3	9M
	b	Calculate the wavelength of emitted radiation from GaAs laser which has a band gap of 1.44eV.	L4	3M

OR

6	a	Describe optical fiber communication system with block diagram.	L3	8M
	b	Mention the application of optical fiber in sensors.	L1	4M

UNIT-IV

7	a	What is intrinsic semiconductor and explain the formation of extrinsic semiconductors through doping?	L1	8 M
	b	The following data are given for an intrinsic Ge at 300K. Calculate the conductivity of the sample? (n_i= 2.4 x10 19m^{-3}, μ_e = 0.39 m^2-V^{-1}S^{-1}, μ_p = 0.19 m^2-V^{-1}S^{-1}).	L4	4 M

OR

8	a	Explain the formation of p-n junction.	L4	4M
	b	Describe the construction and working mechanism of Photodiode.	L3	8M

UNIT-V

9	a	Explain Josephson effect in superconductors.	L4	8M
	b	Write the applications of superconductors.	L1	4M

OR

10	a	Explain why surface area to volume ratio very large for nano materials?	L4	7M
	b	Write the mechanical, magnetic and optical properties of nanomaterials.	L1	5M

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