O.P.Code:23HS0840b	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. I Year II Semester Regular & Supplementary Examinations June-2025

ENGINEERING PHYSICS

CSE(Artificial Intelligence and Machine Learning)

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 200** Marks)

1	a	Define Diffraction.	CO1	L1	2M
	b	Define Polarisation.	CO1	L1	2M
	c	Define unit cell .	CO2	L1	2M
	d	Draw the planes for given Miller indices i). (111) ii). (202) in cubic system.	CO2	L2	2M
	e	Define dielectric polarization	CO3	L1	2M
	f	What is Bohr magnetron?	CO4	L1	2M
	g	What are matter waves	CO5	L1	2M
	h	Define mean free path.	CO5	L1	2M
	i	What is extrinsic semiconductor?	CO6	L1	2M
	j	What are the applications of Hall effect	CO6	L1	2M

PART-B

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

UNIT-I

2		Discuss the theory of interference of light due to thin films by reflection with suitable ray diagram.	CO1	L2	10M

OR

3	a	Describe the propagation of polarized light in Quarter –Wave plate.	CO1	L3	5M
	b	Describe the propagation of polarized light in Half –Wave plate.	CO1	L3	5M

UNIT-II

4	a	Define atomic packing fraction and derive it for simple cubic crystal structure.	CO2	L3	6M
	b	Write the important features of Miller indices.	CO2	L1	4M

OR

5	a	Explain how crystal structure determined by Powder X-Ray diffraction method.	CO2	L2	7M
	b	What are the advantages of Powder X-Ray diffraction method?	CO2	L1	3M

UNIT-III

6		Explain about electronic, Ionic and Orientation polarizations.	CO3	L2	10M

OR

7	a	Explain hysteresis of ferromagnetic material.	CO4	L2	6M
	b	Distinguish between Soft and Hard magnetic material.	CO4	L2	4M

UNIT-IV

8		Describe the behavior of particle in a one dimensional infinite potential well in terms of Eigen values and function.	CO5	L2	10M

OR

9	a	Derive an expression for electrical conductivity in a metal by quantum free electron theory.	CO5	L3	6M
	b	What are the advantages of quantum free electron theory over classical free electron theory?	CO5	L1	4M

UNIT-V

10	a	Explain the drift and diffusion current densities in semiconductors.	CO6	L1	5M
	b	Derive Einstein's relation for charge carriers in semiconductors.	CO6	L3	5M

OR

11	a	Describe the Hall effect in semiconductors.	CO6	L1	7M
	b	Find the diffusion co-efficient of electron in Si at 300K if $\mu e=0.19 m2\text{-}V^{-1}S^{-1}$.	CO6	L3	3M

***** END *****

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