29 MAR 2023

Reg. No.												

Question Paper Code	11752

B.E./B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022 (MARCH 2023)

Artificial Intelligence and Data Science

(Common to all branches except Computer Science and Business Systems)

20BSPH101 - ENGINEERING PHYSICS

(Regulations 2020)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level,CO
1.	Define Crystal lattice and Unit cell.	*2,K1,CO1*
2.	Copper has FCC structure and its lattice parameter is 3.6 Å. Find the atomic radius.	*2,K2,CO1*
3.	Illustrate the essential parts of the Laser system.	*2,K1,CO2*
4.	What is population inversion?	*2,K1,CO2*
5.	Differentiate between the single mode and multimode fiber.	*2,K2,CO3*
6.	What is meant by attenuation?	*2,K1,CO3*
7.	Discuss the types of modulus of elasticity.	*2,K1,CO4*
8.	Define the Poisson's ratio.	*2,K1,CO4*
9.	Define coefficient of thermal conductivity and mention its units.	*2,K1,CO6*
10.	What is bimetallic strip? Give its use.	*2,K1,CO6*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Determine the atomic radius, coordination number and packing factor for SC and BCC structure.	*13,K2,CO1*
		OR	
	b)	Explain in detail about the Czocharalski and Bridgeman melt growth techniques.	*13,K2,CO1*
12.	a)	Explain the modes of vibrations of CO_2 molecules. Describe the construction and working of CO_2 Laser with necessary diagram.	*13,K2,CO2*
		OR	
	b)	Derive the expression for the Einstein's coefficients of spontaneous and stimulated emissions.	*13,K2,CO2*
13.	a)	Derive the numerical aperture and acceptance angle of an optical fiber.	*13,K2,CO3*
		OR	

b) Discuss the various types of optical fiber. *13,K2,CO3*

14. a) Explain how Torsion pendulum is used to determine the moment of inertia and rigidity modulus of the material of a thin wire. *13,K2,CO4*

OR

b) Explain an experiment to determine Young's modulus of the material of the bar by non-uniform bending. *13,K2,CO4*

15. a) Explain the determination of thermal conductivity of poor conductor by Lee's disc method. *13,K2,CO6*

OR

b) Explain Forbe's method to determine the thermal conductivity of a good conductor. *13,K2,CO6*

PART - C (1 × 15 = 15 Marks)

16. a) Derive Planck's law for blackbody radiation and hence deduce Wien's displacement law and Rayleigh – Jean's law. *15,K2,CO5*

OR

b) Derive Schrodinger's time-independent and time dependent wave equations. *15,K2,CO5*