Reg. No.												

Question Paper Code	12541

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023

First Semester

(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 primitive and non-primitive cells.	*2,K2 ,CO1*
2.	For a cubic system, sketch the planes with Miller Indices (101) and (111).	*2,K2, CO1*
3.	Mention the Characteristics of a laser beam.	*2,K2, CO2*
4.	Estimate the band gap energy of InP Laser which emits light of wavelength 8015˚A.	*2,K2, CO2*
5.	Distinguish between step-index and graded-index fibers.	*2,K2, CO3*
6.	Identify the losses in optical fiber.	*2,K2, CO3*
7.	Tell the factors that are affecting elasticity.	*2,K2, CO4*
8.	Identify the applications of I-shape girders.	*2,K2, CO4*
9.	What is bimetallic strip? Give its use.	*2,K2,CO6*
10.	Define a heat exchanger. Give example.	*2,K2, CO6*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Explain Miller Indices. Derive the expression for the Interplanar spacing or d-spacing for (hkl) planes of a cubic structure.	*13,K2,CO1*
		OR	
	b)	Show that the Atomic Packing Factor for HCP and FCC are same.	*13,K2,CO1*
12.	a)	Describe with a neat sketch the principle, construction and working of a CO_2 laser.	*13,K2,CO2*
		OR	
	b)	Derive the expression for the Einstein's coefficient of spontaneous and stimulated emissions.	*13,K2,CO2*
13.	a)	Derive expressions for the acceptance angle and numerical aperture for an optical fiber cable (OFC).	*13,K2,CO3*

OR

b) Give an account on fiber optic pressure and displacement sensors. *13,K2,CO3*

14. a) Derive the expression for Young's modulus by uniform bending and give the experimental procedure to find it. *13,K2,CO4*

OR

b) Explain the term cantilever? Obtain expression for the depression at the loaded end of cantilever whose other end is fixed as summing that its own weight is not effective in bending. *13,K2,CO4*

15. a) Describe Forbe's method to determine thermal conductivity of metals with relevant theory and experiment. *13,K2,CO6*

OR

b) Derive the expression for effective thermal conductivity through compound media in series and parallel. *13,K2,CO6*

PART - C (1 × 15 = 15 Marks)

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

OR

b) Explain the term Compton Effect? Derive the equation for a Compton shift. *15,K2,CO5*