Reg. No.															

Question Paper Code	13703

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

First Semester

Civil Engineering

(Common to All Branches except CSBS)

24BSPH101 - ENGINEERING PHYSICS

Regulations - 2024

Duration: 3 Hours Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Stress-strain curve can be used to know------- (a) the structural load of materials (b) the bearing capability of materials (c) the loadability of materials (d) All of the mentioned	1	K2	CO1
2.	When a beam is subjected to simple bending, _____ is the same in both tension and compression for the material. (a) Modulus of elasticity (b) Modulus of section (c) Poisson ratio (d) None	1	K1	CO1
3.	Two waves are propagating with same amplitude the nearly same frequency in opposite direction they result in ---------- (a) beats (b) stationary wave (c) resonance (d) wave packet	1	K1	CO2
4.	Which process is responsible for amplification of the light in LASER? (a) blackbody radiation (b) Einstein oscillation (c) Planck's radiation (d) stimulated emission	1	K1	CO2
5.	A travelling wave is described by the equation y(x,t) = [0.05sin (8x – 4t)] m. The velocity of the wave is (a) 8 ms^{-1} (b) 4 ms^{-1} (c) 0.5 ms^{-1} (d) 2 ms^{-1}	1	K2	CO3
6.	Differential form of Gauss law in magnetostatics is (a) $\nabla . B = \rho$ (b) $\nabla . B = 0$ (c) $\nabla . B = \mu_0 J$ (d) $\nabla . B = -\frac{\partial B}{\partial t}$	1	K2	CO3
7.	Wien's displacement law holds good for (a) shorter wavelength (b) longer wavelength (c) visible region (d) infrared region	1	K1	CO4
8.	If an electron and a proton have same de-Broglie wavelength then the kinetic energy of the electron is (a) less than that of proton (b) more than that of proton (c) equal to that of proton (d) Zero	1	K1	CO4
9.	Number lattice points in primitive cell is (a) One (b) Two (c) Three (d) Depends on type of Bravais lattice	1	K1	CO5
10.	The rate of heat transfer is maximum for ------- (a) conduction (b) convection (c) radiation (d) all the mentioned	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	What is elasticity?	2	K1	CO1
12.	Define Poisson's ratio.	2	K1	CO1
13.	State any two differences between progressive and stationary waves.	2	K1	CO2
14.	List out the characteristics of Laser.	2	K1	CO2
15.	Explain about momentum and energy relation of electromagnetic waves.	2	K2	CO3
16.	What is polarization in electromagnetic waves?	2	K1	CO3
17.	What is black body radiation?	2	K1	CO4

18.		Enumerate the physical significance of wave function.	*2*	*K2*	*CO4*
19.		Copper has FCC structure whose atomic radius is 1.26×10^{-10} m. Calculate its lattice constant.	*2*	*K3*	*CO5*
20.		Sketch (101) and (111) planes for a cubic crystal.	*2*	*K3*	*CO5*
21.		What is the principle of solar water heater?	*2*	*K1*	*CO6*
22.		Name the different types of heat exchangers.	*2*	*K1*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Describe with necessary theory, the method to determine the Young's modulus of the material of a rectangular bar by uniform bending.	*11*	*K3*	*CO1*
		OR			
	b)	Derive an expression for depression at the free end of a cantilever due to load.	*11*	*K3*	*CO1*
24.	a)	Explain the formation of fringes in an air wedge shaped film. How is the thickness of wire determined by this method?	*11*	*K3*	*CO2*
		OR			
	b)	Describe the vibration modes of CO_2 molecules. Explain the principle, construction and working of a CO_2 laser.	*11*	*K3*	*CO2*
25.	a)	Describe the production of electromagnetic waves in detail.	*11*	*K2*	*CO3*
		OR			
	b)	Derive the Maxwell's equations.	*11*	*K2*	*CO3*
26.	a)	Derive Planck's law for black body radiation.	*11*	*K2*	*CO4*
		OR			
	b)	Derive an expression for energy levels of a particle enclosed in one dimensional potential box of width 'a' and infinite height.	*11*	*K2*	*CO4*
27.	a)	Derive the c/a ratio and atomic packing factor of HCP structure.	*11*	*K2*	*CO5*
		OR			
	b)	Derive an expression for interplanar distance for a cubic system.	*11*	*K2*	*CO5*
28.	a)	Describe Forbe's method to determine thermal conductivity of metals with relevant theory.	*11*	*K3*	*CO6*
		OR			
	b)	Discuss the principle, construction and working of refrigerator.	*11*	*K3*	*CO6*