Reg. No.															

Question Paper Code	13358

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024 (JAN - 2025)

First Semester

Computer Science and Business Systems

24BSPH102 - PHYSICS FOR COMPUTING SCIENCE

Regulations - 2024

Duration: 3 Hours Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Which of the following does not show any interference pattern? (a) Soap bubble (b) Excessively thin film (c) A thick film (d) Wedge Shaped film	1	K1	CO1
2.	When two waves of same amplitude add constructively, the intensity becomes ___ (a) Double (b) Half (c) Four Times (d) One-Fourth	1	K1	CO1
3.	How can the fringe width increase in Young's double-slit experiment? (a) By decreasing the width of the slit (b) By reducing the separation of slits (c) By reducing the wavelength of the slits (d) By decreasing the distance between slits and the screen	1	K1	CO1
4.	Which of the following is a thermodynamics law? (a) Zeroth law of thermodynamics (b) Faraday's Law of thermodynamics (c) Ideal Gas Law of thermodynamics (d) Boyle's Law of thermodynamics	1	K1	CO2
5.	Which of the following is an application of thermodynamics? (a) Refrigerators (b) Gas compressors (c) Power plants (d) All of the mentioned	1	K1	CO2
6.	Heat flow into a system is ____ and heat flow out of the system is _____ (a) positive, positive (b) negative, negative (c) negative, positive (d) positive, negative	1	K1	CO2
7.	In a simple harmonic oscillator, at the mean position _____ (a) Kinetic energy in minimum, potential energy is maximum (b) Both kinetic and potential energies are maximum (c) Kinetic energy is maximum, potential energy is minimum (d) Both kinetic and potential energies are minimum	1	K1	CO3
8.	In case of a forced vibration, the resonance wave becomes very sharp when the ------ (a) Applied periodic force is small (b) Quality factor is small (c) Damping force is small (d) Restoring force is small	1	K1	CO3
9.	Damping force on a spring mass system is proportional to which of the following quantities? (a) Velocity (b) Acceleration (c) Displacement from mean position (d) $(\text{velocity})^2$	1	K1	CO3
10.	Amorphous solids have _____ structure. (a) Regular (b) Linear (c) Irregular (d) Dendritic	1	K1	CO4
11.	Number of Bravais lattices in crystallography is ------ (a) Eleven (b) Twelve (c) Thirteen (d) Fourteen	1	K1	CO4
12.	What is the coordination number of a simple cubic structure? (a) 6 (b) 8 (c) 10 (d) 12	1	K1	CO4
13.	The spontaneous emission produces (a) coherent light (b) incoherent light (c) white light (d) none of the above	1	K1	CO5
14.	An atom or molecule in the ground state of energy E_1 can absorb a photon of energy hν and go the higher energy state E_2, then the process is known as (a) Stimulated radiation (b) Stimulated absorption (c) Stimulated emission (d) Spontaneous absorption	1	K1	CO5

15. The main principle of optical fiber is …… *1 K1 CO5*
(a) total internal reflection (b) total internal refraction
(c) total internal dispersion (d) none of the above

16. Multimode step index fiber has _____ *1 K1 CO5*
(a) Large core diameter & large numerical aperture
(b) Large core diameter and small numerical aperture
(c) Small core diameter and large numerical aperture
(d) Small core diameter & small numerical aperture

17. Electromagnetic waves are produced by *1 K1 CO6*
(a) A static charge (b) An accelerated charge
(c) A moving charge (d) Charged particles

18. In electromagnetic waves the phase difference between electric field vector and magnetic field vector is *1 K1 CO6*
(a) zero (b) $\pi/2$ (c) π (d) $\pi/3$

19. Which characteristic of an electromagnetic wave is affected by the medium through which it travels? *1 K1 CO6*
(a) Time period (b) Velocity (c) Wavelength (d) Frequency

20. Which of the following is not a unit of flux? *1 K1 CO6*
(a) Maxwell (b) Tesla (c) Weber (d) All of the above

PART - B (10 × 2 = 20 Marks)

Answer ALL Questions

21. What is diffraction? *2 K1 CO1*
22. What is Brewster's Law? *2 K1 CO1*
23. What is isolated system? *2 K1 CO2*
24. What is an adiabatic process? *2 K1 CO2*
25. Define Linear and angular Simple Harmonic Motion. *2 K1 CO3*
26. What is critical damping oscillator? *2 K1 CO3*
27. Define unit cell. *2 K1 CO4*
28. What is coordination number? *2 K1 CO4*
29. Distinguish between spontaneous and stimulated emission. *2 K2 CO5*
30. What is current density? *2 K1 CO6*

PART - C (6 × 10 = 60 Marks)

Answer ALL Questions

31. a) Explain how wavelength of monochromatic light is determined by Newton's rings method. *10 K2 CO1*

OR

b) Discuss the Fraunh offer diffraction due to single slits and obtain the intensity distribution and positions of maxima and minima. *10 K2 CO1*

32. a) What is the Second law of thermodynamics? Discuss the concept of Carnot's engine. *10 K2 CO2*

OR

b) Explain the concept of entropy and derive the expression for entropy. Also list out any four characteristics features of entropy. *10 K2 CO2*

33. a) Explain the free vibration of simple spring mass system. *10 K2 CO3*

OR

b) Derive the equation of forced mechanical oscillators. *10 K2 CO3*

34. a) Derive the expression for inter-planar distance in a cubic lattice in terms of its lattice constant. *10 K2 CO4*

OR

	b)	Obtain the axial ratio (c/a) for HCP structure and hence calculate its packing density.	*10*	*K2*	*CO4*
35.	a)	Explain the various losses associated with optical fibers.	*10*	*K2*	*CO5*
		OR			
	b)	Explain basic processes involve in Einstein's theory of radiation and deduce relation for A and B coefficients.	*10*	*K2*	*CO5*
36.	a)	Derive Maxwell's equations.	*10*	*K2*	*CO6*
		OR			
	b)	Derive the expression for wave equation for a wave propagating in a conducting medium.	*10*	*K2*	*CO6*