Reg. No.												

Question Paper Code	12133

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023

First Semester

Computer Science and Business System

20BSPH102 - FUNDAMENTALS OF PHYSICS

(Regulations 2020)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	Define Interference of light.	*2,K1,CO1*
2.	Define the term Polarization.	*2,K1,CO1*
3.	Differentiate between primitive and non-primitive cell.	*2,K2,CO2*
4.	What are Miller indices?	*2,K1,CO2*
5.	Define the term Heat.	*2,K1,CO4*
6.	Define internal Energy of a thermodynamic system.	*2,K1,CO4*
7.	Classify solids into conductors, insulators and semiconductors based on band gap.	*2,K2,CO5*
8.	Mention some physical significance of wave function.	*2,K1,CO5*
9.	Differentiate spontaneous emission from stimulated emission of radiation.	*2,K2,CO6*
10.	What are the components of a laser system?	*2,K1,CO6*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	With neat sketch explain the formation of Newton rings and derive the expression for the diameter of dark and bright rings in a reflected system.	*13,K2,CO1*
		OR	
	b)	Summarize the theory and experimental arrangement of Fresnel's Bi-prism and derives the equation for maxima and minima.	*13,K2,CO1*
12.	a)	With neat sketch calculate the atomic packing fraction for BCC and FCC crystal structures.	*13,K2,CO2*
		OR	
	b)	Derive the expression for the inter planar spacing in a cubic structure.	*13,K2,CO2*

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

13. a) State and derive Maxwell's equation in point form from integral form and represent it for a non-conducting medium. *13,K2,CO4*

OR

b) Summarize the concept of reversible and irreversible process? Illustrate your answer with some examples. *13,K2,CO4*

14. a) Deduce the expression for De-Broglie wavelength and represent it in the form of energy and accelerating potential. *13,K2,CO5*

OR

b) Derive the expression for time dependent Schrodinger equation for a free particle from Schrodinger time independent equation. *13,K2,CO5*

15. a) Describe the construction and working of a CO_2 laser with a neat sketch. *13,K2,CO6*

OR

b) Explain with basic principle, the construction and working of any one type of optical fiber sensor. *13,K2,CO6*

PART - C (1 × 15 = 15 Marks)

16. a) Explain the concept of damped harmonic oscillation in LCR circuit and ballistic galvanometer and derive its differential equation and solution. *15,K2,CO3*

OR

b) With neat sketch derive the expression for time period of oscillation and frequency of a spring -mass system suspended both horizontally vertically. *15,K2,CO3*