Reg. No.												

Question Paper Code	12542

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

First Semester

Computer Science and Business Systems

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.	How crystalline materials differ from non-crystalline?	*2,K1,CO2*
2.	Define unit cell.	*2, K1,CO2*
3.	Differentiate between free and forced oscillation, Give one example for each.	*2,K1,CO3*
4.	Define damping.	*2,K1,CO3*
5.	What is an isolated system?	*2,K1,CO4*
6.	Define the term entropy.	*2,K1,CO4*
7.	What are matter waves?	*2,K1,CO5*
8.	How Fermi level energy function varies with temperature?	*2,K2,CO5*
9.	Why optical resonator is required in a laser system?	*2,K2,CO6*
10.	List out the properties of a laser.	*2,K1,CO6*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Explain the procedure to obtain the miller indices of crystal planes with suitable example.	*13,K2,CO2*
		OR	
	b)	Summarize and calculate packing factors for BCC, and FCC crystal structure. Illustrate.	*13,K2,CO2*
12.	a)	Demonstrate the expression for time period of oscillation and frequency of a spring -mass system suspended both horizontally vertically.	*13,K2,CO3*
		OR	
	b)	Derive the differential equation of a damped harmonic oscillator and graphically discuss in detail the over damped, critical damped and under damped motions of a damped harmonic oscillator.	*13,K2,CO3*

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

OR

b) Classify the thermodynamics laws and discuss their significance. *13,K2,CO4*

14. a) Show that the solution of Schrodinger wave equation for a particle in an infinite potential well leads to the concept of quantization of energy. *13,K2,CO5*

OR

b) Explain band theory of solids in detail for conductor, semiconductor and insulator. *13,K2,CO5*

15. a) Explain the working of CO_2 laser with the help of neat energy level diagram. *13,K2,CO6*

OR

b) Classify fibers based on material, modes and refractive index profile with neat sketch. *13,K2,CO6*

PART - C (1 × 15 = 15 Marks)

16. a) Explain the theory of plane transmission grating and derive equation of maxima and minima. *15,K2,CO1*

OR

b) Summarize the theory and experimental arrangement of Fresnel's Biprism and derives equation for maxima and minima. *15,K2,CO1*