647510 **BSCphMD201x-1C** **Seat No :_____**

B.Sc. Semester – 1 (NEP-2020) Examination

January-2024

Mechanics and Solid-State Electronics (MDC)

Time: 2:00 Hours **Marks: 50**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1	(A) Derive equation of motion for simple harmonic motion.	(05)
	(B) Explain energy conservation in Simple Harmonic Motion.	(05)
	OR	
Que.1	(A) Explain Damped Oscillations.	(05)
	(B) Explain forced Oscillation and Resonance.	(05)
Que.2	(A) Explain determination of Young's Modulus by Searl's Method.	(05)
	(B) Explain Young's Modulus and Bulk Modulus.	(05)
	OR	
Que.2	(A) Explain Longitudinal, Shearing and Volume Strain.	(05)
	(B) Explain Modulus of rigidity and Poisson's Ratio.	(05)
Que.3	(A) Explain formation of PN Junction.	(05)
	(B) Explain reverse biased PN Junction and its Characteristics.	(05)
	OR	
Que.3	(A) Explain energy bands in Metal, Insulator and Semiconductors.	(05)
	(B) Explain P type and N type Semiconductors.	(05)
Que.4	(A) Give definition of the following terms. (i) Amplitude (ii) Time Period (iii) Frequency (iv) Phase	(05)
	(B) Explain Zener Diode and its Characteristics.	(05)
	OR	
Que.4	(A) A particle of mass 0.5kg is performing SHM under a force F = - (20N/m) x. If it crosses the mean position with a speed of 3m/s, find the amplitude of the Motion.	(05)
	(B) Explain forward biased PN Junction and its Characteristics.	(05)
Que.5	(A) Give definition of. (i) Stress (ii) Strain (iii) Longitudinal Stress (iv) Shearing Stress (v) Volume Stress	(05)
	(B) Explain Static resistance and dynamic resistance.	(05)
	OR	
Que.5	(A) Define Hooke's Law and also explain what is Torsion pendulum.	(05)
	(B) Give differences between P type and N type semiconductor.	(05)

****