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

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

OCT/NOV-2025

PHY: Mechanics and Solid-State Electronics (Multidisciplinary Course)

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

Instructions:

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

Que.1 Answer the following questions. (Any two). (10)

1) Describe Resonance and derive equation for it.
2) Derive equation of motion for SHM.
3) Describe conservation of energy in SHM.

Que.2 Answer the following questions. (Any two). (10)

1) Write a note on Young's Modulus by Searl's Method.
2) Explain Volume strain and Poisson's Ratio.
3) Write a note on Torsion pendulum.

Que.3 Answer the following questions. (Any two). (10)

1) Give differences between P type and N type semiconductor.
2) Write a note on formation of PN junction.
3) write a note on Zener Diode.

Que.4 Answer the following questions. (Any five). (10)

1) Describe Simple harmonic motion as projection of uniform circular motion.
2) Explain energy bands in semiconductors.
3) Explain minority and majority carriers in P type semiconductors.
4) A wire of the length 1m and radius 1 mm is hanged by 400g mass, When hanged, 2.5mm stretching was observed. Calculate the young's modulus of the wire. Take g = 10 m/s^2.
5) What is Damped Oscillation?
6) Define: (1) Amplitude (2) Phase
7) Draw the graph for I-V characteristics of PN junction.
8) Write units of (1) Stress (2) Strain
9) Explain Hooke's law.

Que.5 Answer the following questions. (Any two). (10)

1) Explain Young's Modulus and Bulk Modulus.
2) Derive equation of time period $T=2\pi\sqrt{l/g}$ for simple pendulum.
3) Explain reverse biased PN Junction and its Characteristics.

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