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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 $g = 10 \text{ m/s}^2$.
 - 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.
