

B.Sc.(FS) Semester – 1 (NEP-2020) Examination**January-2024****Physics (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. (05)
 (i) Amplitude (ii) Time Period
 (iii) Frequency (iv) Phase
 (B) Explain Zener Diode and its Characteristics. (05)
 OR
- Que.4 (A) A particle of mass 0.5kg is performing SHM under a force $F = - (20\text{N/m}) x$. 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. (05)
 (i) Stress (ii) Strain (iii) Longitudinal Stress
 (iv) Shearing Stress (v) Volume Stress
 (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)
