

B.Sc. Semester - 2 (NEP-2020) Examination**MARCH/APRIL-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.
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- Que-1 Answer any 2 out of 3 from following questions. (10)
- 1) Explain gravitational potential energy.
 - 2) What is weightlessness? Explain it in a satellite.
 - 3) Derive an expression for escape velocity of a body from the surface of the Earth.
- Que-2 Answer any 2 out of 3 from following questions. (10)
- 1) Derive an expression for the efficiency of a full wave rectifier.
 - 2) What is ripple factor? Derive its value for half wave and full wave rectifier.
 - 3) Explain capacitor input filter (π - filter).
- Que-3 Answer any 2 out of 3 from following questions. (10)
- 1) Explain common base N-P-N transistor connection in detail.
 - 2) Explain input and output characteristics of common emitter N-P-N transistor connection.
 - 3) Describing base resistor method for transistor biasing, write its advantages and disadvantages.
- Que-4 Answer any 5 out of 9 from following questions. (10)
- 1) Explain Newton's law of gravitation.
 - 2) Write Kepler's law of planetary motion.
 - 3) Write applications of GPS.
 - 4) Write a note on semiconductor diode.
 - 5) Explain capacitor filter.
 - 6) Write a note on Zener diode.
 - 7) Explain transistor connections.
 - 8) Describing transistor biasing, explain its need.
 - 9) Write a note on Stability Factor.
- Que-5 Answer any 2 out of 3 from following questions. (10)
- 1) Write a note on GPS.
 - 2) Explain working of full wave bridge rectifier.
 - 3) Describe voltage (potential) divider bias method for transistor biasing.
