

B.Sc. Semester - 5 (Remedial) (NEP-2020) Examination**March/April-2026****PHY: Mathematical Physics, Classical Mechanics & Quantum Mechanics (Major-11)****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) Write a note on Divergence.
 - (2) Explain fundamental theory for Gradient.
 - (3) Write properties of Fourier series.
- Que.2 Answer any 2 out of 3 from following questions. (10)
- (1) Derive Lagrange equations of motion.
 - (2) Derive Hamilton's equations of motion.
 - (3) Describe simple pendulum.
- Que.3 Answer any 2 out of 3 from following questions. (10)
- (1) Derive Schrodinger equation for a free particle in one dimension.
 - (2) Discuss Ehrenfest's Theorem.
 - (3) Derive time independent Schrodinger equation.
- Que.4 Answer any 2 out of 3 from following questions. (10)
- (1) Derive Schrodinger equation for an N-particle system.
 - (2) Write fundamental postulates of wave mechanics.
 - (3) Discuss Dirac-Delta function.
- Que.5 Answer any 5 out of 8 from following questions. (10)
- (1) Write statement of Gauss Theorem & Stock Theorem.
 - (2) Write advantages of Fourier series.
 - (3) Explain D'Alembert's Principle.
 - (4) Explain Hamilton's Principle.
 - (5) Explain Adjoint of an operator.
 - (6) Write a note on Eigen Values.
 - (7) Discuss Conservation of Probability.
 - (8) Write a note on Expectation Values.
