

DR.B.R.Ambedkar Open University
M.Sc First Year - PHYSICS (2025-2026)
Course - I: Mathematical Physics and Classical Mechanics

ASSIGNMENT-I

Maximum Marks: 15
Minimum marks: 06

Instructions to the Candidates:

- I. Answer **all** the following questions.
- II. Each question carries **5** marks.
 1. Show that Kronecker delta is a mixed tensor of rank two.
 2. Define Poisson brackets? Discuss its properties.
 3. Obtain Hamilton's equations of motion in Poisson bracket notations

ASSIGNMENT-II

Maximum Marks: 15
Minimum marks: 06

Instructions to the Candidates:

- III. Answer **all** the following questions.
- IV. Each question carries **5** marks.
 1. Find a real root of $f(x) = x^3 - 3x - 5 = 0$ using the Bisection method.
 2. Find the solution of the Laplace's equation in Cartesian coordinate system.
 3. What are the merits and demerits of the Euler method of solving initial value problem.

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Course -II: Statistical Mechanics and Quantum Mechanics

ASSIGNMENT-I

Maximum Marks: 15

Minimum marks: 06

Instructions to the Candidates:

I. Answer **all** the following questions.

II. Each question carries **5** marks.

1. Explain the postulates of quantum mechanics.
2. State and prove Wigner –Eckart theorem.
3. Discuss the inadequacy of classical mechanics.

ASSIGNMENT-II

Maximum Marks: 15

Minimum marks: 06

Instructions to the Candidates:

III. Answer **all** the following questions.

IV. Each question carries **5** marks.

1. State and prove Liouville's theorem.
2. Write a note on Pauli's Eigen values and Eigen functions.
3. Explain stark effect Hydrogen atom.

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Course -III: Solid State Physics

ASSIGNMENT-I

Maximum Marks: 15

Minimum marks: 06

Instructions to the Candidates:

- I. Answer **all** the following questions.
- II. Each question carries **5** marks.
 1. State and explain the First Fick's law of diffusion.
 2. Obtain expressions for electron and hole concentrations in intrinsic semiconductors.
 3. What is Meissner effect? Differentiate between Type I and Type II superconductors.

ASSIGNMENT-II

Maximum Marks: 15

Minimum marks: 06

Instructions to the Candidates:

- III. Answer **all** the following questions.
- IV. Each question carries **5** marks.
 1. What is Hall Effect? What information can be obtained from this?
 2. Show that the reciprocal lattice for a body centred space lattice is a face centred lattice.
 3. Discuss the Einstein's theory of specific heats.

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Course - IV: Semiconductor Device, Analog and Digital Electronics

ASSIGNMENT-I

Maximum Marks: 15

Minimum marks: 06

Instructions to the Candidates:

- I. Answer **all** the following questions.
- II. Each question carries **5** marks.
 1. Explain Astable Multivibrator with a neat circuit diagram.
 2. What are SISO and PIPO? Discuss in detail.
 3. Draw the circuit diagram of full wave rectifier & their corresponding wave forms and derive its ripple factor

ASSIGNMENT-II

Maximum Marks: 15

Minimum marks: 06

Instructions to the Candidates:

- III. Answer **all** the following questions.
- IV. Each question carries **5** marks.
 1. State and Prove De Morgan's theorem.
 2. Explain open loop and closed loop gains of an op-amp.
 3. What are digital to Analog converters? Discuss the Variable Resistor Network for D/A conversion.
