

Code No. 3525 / CBCS / Non-CBCS

FACULTY OF SCIENCE

M.Sc. I - Semester (CBCS/Non-CBCS) Examination, December 2014

Subject: Physics / Applied Electronics
Paper – II: Classical Mechanics

Time: 3 hours

Max. Marks: 80

Note: Answer all questions from Part - A and Part - B.
Each question carries 4 marks in Part - A and 12 marks in Part - B.

PART – A (8 x 4 = 32 Marks)
(Short Answer Type)

- 1 Explain Galilean transforms.
- 2 Define momentum four vector
- 3 What are constraints? Explain.
- 4 State and explain Hamilton's principle.
- 5 What are cyclic coordinates? Explain.
- 6 Define Lagrange Brackets.
- 7 Write a note on normal coordinates.
- 8 Comment on principal axis transformation.

PART – B (4 x 12 = 48 Marks)
(Essay Answer Type)

- 9 a) What is 4-D space according to Minkowski? Arrive at Lorentz transformation in four-dimensional space.

OR

b) Obtain Euler's equations of motion for a rigid body.
- 10 a) What is D' Alembert's principle? Derive Lagrange's equations of motion from this principle for conservative system.

OR

b) Setup Lagrangian for a charged particle in the presence of an external electro magnetic field.
- 11 a) What are Poisson brackets and write their properties? Obtain Hamilton's equations in Poisson bracket form.

OR

b) State and explain principle of least action and give examples for it.
- 12 a) Discuss and analyze the free vibrations of a linear triatomic molecule.

OR

b) Obtain the Lagrangian for a continuous system.
