



Code No. : **299**

FACULTY OF SCIENCE
M.Sc. I Semester Examination, November/December 2012
PHYSICS/APPLIED ELECTRONICS
Paper – II : (Classical Mechanics)

Time: 3 Hours]

[Max. Marks: 80

PART – A

(8×4=32 Marks)

1. Explain Minkowski space and define four velocity.
2. Distinguish between inertial and non-inertial frames.
3. What are constraints ? Give examples.
4. State and explain D'Alembert's principle.
5. What are cyclic coordinates ? Explain.
6. Express Hamilton's equations in Poisson bracket form.
7. What are normal coordinates and normal frequencies ?
8. Discuss about principal axis transformation.

PART – B

(12×4=48 Marks)

9. a) i) Briefly explain four momentum.
ii) Obtain Lorentz transformation equations in four space.
OR
b) i) What are body and space coordinate systems in relation to the motion of a rigid body ?
ii) Deduce Euler's equations of motion for a rigid body.
10. a) i) What do you mean by velocity dependent potential ?
ii) Obtain an expression for Lagrangian for a charged particle moving in an EM field.

OR



- b) i) State Hamilton's principle and derive Lagrange's equations of motion for a conservative system.
- ii) What happens in the case of non-conservative systems.
11. a) Define Lagrange and Poisson brackets. Find a relation between them.
- OR
- b) Derive Hamilton-Jacobi equation and discuss its importance.
12. a) Obtain an equation for a vibrating string and deduce normal modes.
- OR
- b) Discuss the free vibrations of a linear triatomic molecule.
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