



Vitthalbhai Patel & Rajratna P.T.P.SCIENCE COLLEGE
VALLABH VIDYANAGAR

B.Sc. (Semester - 5)

Subject: Physics

Course: US05CPHY01 (Classical Mechanics)

Internal Examination

Date: 29/09/2016

Time: 11:00 a.m. to 12:30 p.m.

Thursday

Total Marks: 30

N.B: (i) All the symbol have their usual meanings

(ii) Figures at the right side of questions indicate full marks

Q-1 Multiple Choice Questions (Attempt All) (03)

- (1) The gravitational force between two masses is _____
(a) repulsive (b) attractive
(c) zero (d) infinity
- (2) The number of independent variable for a free particle in space are ____
(a) N (b) 2N
(c) 3N (d) zero
- (3) The shortest distance between two points in a plane is _____
(a) circular (b) hyperbolic
(c) parabolic (d) straight

Q-2 Short Questions (Attempt any Two) (04)

- (1) State the Kepler's second law of planetary motion
- (2) What is degree of freedom?
- (3) State the Hamilton's principle

Q-3 Derive the equation of motion of equivalent one body and explain why apple falls toward the earth and not the earth towards the apple? **(06)**

OR

Q-3 Discuss the motion of a particle in a central force field and prove the conservation laws of linear momentum and total energy **(06)**

Q-4 Derive the Lagrange's equation of motion for a conservative system from D'Alembert's principle **(06)**

OR

Q-4 Construct the Lagrangian of Atwood machine and derive its the equation of motion **(06)**

Q-5 Discuss the technique of calculus of variation and derive the general Euler's equation **(06)**

OR

Q-5 Derive the Hamilton's equation of motion **(06)**