1212-14-468-023

Code No. 7002/E

FACULTY OF SCIENCE

B.Sc. I-Semester (CBCS) Examination, November / December 2017

Subject : Physics

Paper – I : Mechanics

Time : 3 Hours **Max. Marks: 80**

PART – A (5 x 4 = 20 Marks)
(Short Answer Type)
Note : Answer any FIVE of the following questions.

1 Define Gradient, Divergence and Curl. Give examples to each. What are their physical significance.
2 Prove that Curl of a gradient is zero.
3 Describe the principle of motion of a rocket as a system of variable mass.
4 Define impact parameter and scattering cross section.
5 Are central forces are conservative? Give two examples of central forces.
6 State and explain Kepler's Laws of planetary motion.
7 Mention the postulates of special theory of relatively.
8 Explain the concept of four vector formalism.

PART – B (4 x 15 = 60 Marks)
(Essay Answer Type)
Note: Attempt ALL the questions.

9 (a) Define surface and volume integral. State and prove Gauss's divergence theorem.

OR

(b) Define Green's theorem. Give the proof of Green's theorem.

10 (a) Define elastic and inelastic collisions. Give the theory of elastic collisions in two dimensions.

OR

(b) What is a symmetric top? Explain the precession of top and obtain an expression for precession velocity of symmetric top.

11 (a) Show that conservative force as a negative gradient of potential energy.
(b) What is Coriolis force and obtain its expression?

OR

(c) Derive Kepler's second law and third law of planetary motion.

12 (a) Describe the working of Michelson-Morely experiment and derive the expression for the fringe shift.

OR

(b) What is length contraction? Obtain expression for length contraction.
(c) Explain the concept of time dilation.

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