

Or

No. of Printed Pages : 04

Roll No.

9. (a) Discuss the variation of mass with velocity on the basis of special theory of relativity. **10**
- (b) Rest mass of proton is 1.67×10^{-27} kg, if it starts moving with a speed of $0.8c$, then what will be its energy ? **5**

B511

Dual Degree B.Sc. (Hons.)/M. Sc.

EXAMINATION, May 2019

(Second Semester)

(Main & Re-appear)

PHYSICS

DPH102

Mechanics-II

Time : 3 Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Q. No. **1** is compulsory. Attempt *Five* questions in all including the compulsory question and select at least *one* question from each Unit. All questions carry equal marks.

M-B511

4

100

(2-05/23) **M-B511**

P.T.O.

Compulsory Question

1. (a) What is the relation between relativistic momentum and energy ?
- (b) Show that velocity is variant in Galilean transformation.
- (c) Differentiate between elastic and inelastic collisions.
- (d) What do you mean by generalized Momenta ?
- (e) What will be the energy corresponding to the mass of positron (mass of positron = 9.1×10^{-31} kg). **3×5=15**

Unit I

2. Write differential equation for the forced damped harmonic oscillations and solve the differential equation. **15**

Or

3. (a) Define the Q-factor and find the Q-value for damped oscillator. **8**
- (b) What mass should be hang on a spiral spring having a stiffness constant (K) = 89.2 N/m, so that it vibrates with period time of one second. **7**

M-B511

2

Unit II

4. Derive the expression for Hamilton's variation Principle using D'Alemberts Principle. **15**

Or

5. (a) Setup the Language for Atwood Machinde and derive an expression for its acceleration. **10**
- (b) What do you mean by Degree of freedom of a system, explain with example. **5**

Unit III

6. Discuss in detail the effects of Centrifugal and Coriolis forces due to earth rotation. **15**

Or

7. Derive the transformation equation for a rotation of frame of reference. **15**

Unit IV

8. What are the postulates of special theory of relativity and derive the Lorentz transformation equation of relativity. **15**

(2-05/24) M-B511

3

P.T.O.