Roll No. .....

21272

B. Sc. (Physics) (Hons.) 2nd Semester Examination – May, 2019

MECHANICS - II

Paper : Phy-202

Time : Three hours] *[Maximum Marks : 40*

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

Note : (i) Each Unit have ***four*** questions, student have to attempt at least ***two*** questions from each Unit. A student has to attempt five questions in all.

(ii) Use of scientific (Non-programmable) calculator is allowed.

UNIT – I

1. Derive expressions for gravitational potential at a point inside and outside a thin uniform spherical shell. 8

P. T. O.

2. (a) State the Newton's Law of gravitation and hence define the gravitational constant G. 5

(b) Explain the term gravitational self energy. 3

3. (a) State and deduce an expression for Kepler's first law. 5

(b) The eccentricity of earth's orbit is 0.0167. Calculate the ratio of maximum and minimum speeds of the earth in its orbit. 3

4. How will you reduce two body problem into one body problem ? And hence explain the concept of reduced mass. Give its two examples. 8

UNIT – II

5. (a) What are Galilean transformations ? Show that under Galilean transformation velocity is variant and acceleration is invariant. 5

(b) Define the following terms : 3

(i) Centrifugal force

(ii) Coriolis force

6. Describe Michelson and Morley experi important conclusions are drawn from it ?

7. State the basic postulates of special theory and hence obtain the Lorentz transformatio

8. (a) Discuss :

(i) Length contraction

(ii) Time dilation, on the basis transformation

(b) Calculate the apparent length of a meto it is carried in a rocket at a speed of 2.8 Take $C = 3 \times 10^8$ m/s.