Roll No. | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

B.Sc. (Non Medical) (2018 Batch) (Sem.–2)

MECHANICS-II

Subject Code : BSNM203-18

M.Code : 76301

Date of Examination : 09-07-22

Time : 3 Hrs. **Max. Marks : 50**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Write briefly :

a) What is the difference between inertial and gravitational mass?

b) Write a short note on electrostatic self-energy.

c) What is gravitational energy?

d) What is the difference between central forces and non-central forces?

e) Why the velocity of a planet increases when it comes near the sun?

f) Is earth an inertial frame of reference? Explain.

g) Are all periodic motions simple harmonic motion? Is the reverse true?

h) What is damping? On what factors the damping depends?

i) At what velocity the mass of a body is 2.25 times its rest mass?

j) What is the significance of compensating plate in Michelson-Morley experiment?

SECTION-B

2. State and prove the law of gravitation.

3. What is the force between point mass and a sphere? Discuss in detail.

4. A satellite moves in a circular orbit round the earth at a height of 620 km from the surface. If the radius of the earth is 6380 km, calculate the velocity and the period of revolution.

5. Find the value of the total energy of a simple harmonic oscillator. Is it conserved?

6. What is time dilation? On the basis of Lorentz transformations derive an expression for time dilation.

SECTION-C

7. State and derive Kepler's laws of planetary motion.

8. Examine the effect of periodic force on the motion of a system where damping cannot be neglected. Discuss the 'transient part' as well as the ‘steady state’, term in the complete solution.

9. Deduce an expression for variation of mass with velocity and depict it graphically. Also prove that no material particle can have a velocity equal or greater than the velocity of light.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.