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

Total No. of Questions : 09

B.Sc. (Non-Medical) (Sem.–2)

MECHANICS-II

Subject Code : BSNM-203-18

M.Code : 76301

Date of Examination : 17-12-2022

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 gravitational potential energy?

(b) What is the significance of a point mass?

(c) Define the reduced mass of a two-body system.

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

(e) What is a non-inertial frame of reference?

(f) State the condition under which the particle experiences a Coriolis force.

(g) Explain how the interaction of inertia and elasticity produces simple harmonic motion?

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

(i) With what speed a clock should move so that it may appear to be losing one minute in twenty-four hours?

(j) What was the aim of Michelson-Morley experiment?

SECTION-B

2. Write a note on gravitational and electrostatic self-energy.

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

4. Calculate the fictitious force and the total force acting on a freely falling body of mass 5 kg in a frame moving vertically with an upward acceleration of 5 ms^{-2}.

5. What do you understand by simple harmonic motion? Derive the differential equation for simple harmonic motion.

6. What is length contraction? On the basis of Lorentz transformations derive an expression for length contraction.

SECTION-C

7. What is Coriolis force? In which frame does it work? Deduce the expression for it.

8. Write the differential equation for damped oscillator and find the solution for it when the oscillator is lightly damped.

9. What is relativistic energy? State and prove mass-energy equivalence.

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.