Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 07

B.Sc. (CS) (2013 & Onwards)   (Sem.–5)
FUNDAMENTALS OF DYNAMICS
Subject Code : BCS-502
M.Code : 72575

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.**

SECTION-A

1. **Answer briefly :**

    (a) A stone is thrown vertically and then it returns to the thrower. Is it a projectile? Explain.

    (b) Vehicles stop on applying brakes. Does this phenomenon violate the principle of conservation of momentum?

    (c) The amplitude of simple harmonic oscillator is doubled. How does this affect the maximum velocity and total energy?

    (d) What is conservative force?

    (e) Sound is produced at a time in two exactly identical strings, one of rubber and other of steel. In which string will the sound reach the other end earlier and why?

    (f) Distinguish between centre of mass and reduced mass.

    (g) What do you mean by angular impulse?

    (h) What is meant by power and energy? Give their units.

    (i) What is the difference between linear momentum and angular momentum?

    (j) How does banking of roads reduce wear and tear of the tyres?

SECTION-B

2. Find (i) the path of projectile (ii) time of flight (iii) horizontal range (iv) maximum height, when projectile is projected with velocity 'v' making an angle θ with the vertical direction.

3. What is a uniform circular motion? Explain the terms: time period, frequency and angular velocity. Establish the relation between them.

4. Explain the relation in phase between displacement, velocity and acceleration in simple harmonic motion, graphically as well as theoretically.

5. Derive an expression for gravitational potential energy of a body.

6. Discuss elastic collision in one dimension. Obtain expressions for velocities of the two bodies after such a collision.

7. State and prove Kepler's laws of planetary motion using the concept of reduced mass.

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.