(FOR THE CANDIDATES ADMITTED   SUBJECT CODE   21UPS507

DURING THE ACADEMIC YEAR 2021 ONLY)   REG.NO.

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : NOVEMBER – 2023

B.Sc. PHYSICS   **MAXIMUM MARKS: 70**

SEMESTER - V   **TIME : 3 HOURS**

PART – III
MECHANICS

SECTION - A   **(10 X 1 = 10 MARKS)**

ANSWER THE FOLLOWING QUESTIONS.
MULTIPLE CHOICE QUESTIONS.   **(K1)**

1. The path traced by a projectile in space is

 (a) coral   (b) orbit   (c) track   (d) trajectory

2. Which one of the following has maximum inertia?

 (a) cricket ball   (b) atom   (c) molecule   (d) coin

3. When an external force is not applied to the system, its total momentum

 (a) becomes zero   (b) remains constant   (c) increases   (d) decreases

4. The motion of planets in the solar system is an example of conservation

 (a) mass   (b) linear momentum   (c) angular momentum   (d) energy

5. A particle moving in space has -------- degrees of freedom

 a) 1   (b) 2   (c) 3   (d) 4

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES   **(K2)**

6. What is vertical motion under gravity?

7. State Newton's first law of motion.

8. Define conservative force.

9. What is centre of mass?

10. What are the limitations of Newton's law?

SECTION – B   **(5 X 4 = 20 MARKS)**
ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.   **(K3)**

11. a) Explain how the motion of a particle projected horizontally from a point above the earth.

                                 (OR)

    b) Calculate the range of a projectile on a plane inclined to the horizontal.

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12. a) State and explain Newton's law of gravitation.

(OR)

b) Explain Lorentz force.

13. a) Explain the concept of work. Give its unit.

(OR)

b) Write a note on torque.

14. a) Discuss the physical significance of moment of inertia.

(OR)

b) Derive an expression for the acceleration of a body rolling down an inclined plane without slipping.

15. a) Prove the laws of conservation of linear and angular momentum for a system of particles.

(OR)

b) Explain the relationship between degrees of freedom and the number of generalized coordinates in a system of particles.

SECTION - C (4 X 10 = 40 MARKS)

ANSWER ANY FOUR OUT OF SIX QUESTIONS
(16th QUESTION IS COMPULSORY AND ANSWER ANY THREE QUESTIONS
(FROM Qn. No : 17 to 21) **(K4 (Or) K5)**

16. Discuss the concept of projectile motion when a particle is projected in any direction.

17. Discuss briefly the charged particle in a uniform and constant electric field.

18. State and explain the principle of conservation of angular momentum.

19. State and prove the theorem of parallel axes for moment of inertia.

20. Explain constraints and its types with examples.

21. Discuss the generalized notation for velocity and acceleration.

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