

KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

THOOTHUKUDI – 628 003

(5 Pages)

Reg. No:

Question Code No : 25001203

Course Code : 25UFPH11

UG Degree - End Semester Examinations, November 2025

First Semester

B.Sc. PHYSICS

Introductory Physics

(For those who joined in June 2025 onwards)

Time : 3Hours

Maximum : 75 Marks

PART - A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer:

1. The dimensional formula of gravitational constant (G) is

(a) $M^{-1}L^3T^{-2}$

(b) $M^1L^3T^{-2}$

(c) $M^{-1}L^2T^{-2}$

(d) $M^{-1}L^3T^{-1}$

2. Identify the scalar quantity.

(a) Displacement

(b) Momentum

(c) Speed

(d) Angular velocity

3. SI unit for measuring force is called as
- (a) Newton (b) Dyne
(c) Joule (d) Kelvin
4. Atoms combine to form molecules due to _____ force.
- (a) Gravitational (b) Nuclear
(c) Electromagnetic (d) Weak
5. SI unit of energy is given as _____
- (a) Watt (b) Joule
(c) Newton (d) Kelvin
6. _____ converts mechanical energy into electrical energy.
- (a) Dynamo (b) Engine
(c) Electric bulb (d) Television
7. If net forces acting on the system is zero, the linear momentum of that system becomes_____
- (a) 1 (b) 0
(c) Infinite (d) Constant
8. When a body repeats its motion in _____ time intervals we say that it is in harmonic motion.
- (a) Regular (b) Irregular
(c) Random (d) Infinite

9. The velocities of different particles passing through the same point may be different and change erratically with time, then we call that as _____ flow.
- (a) Streamline (b) Turbulent
(c) Harmonic (d) Angular
10. Conductors conduct electricity with the help of _____ in metals.
- (a) Holes (b) Free electrons
(c) Protons (d) Electrons

PART - B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 250 words.

11. (a) Given $\vec{a} = 3\vec{i} + 2\vec{j} + 4\vec{k}$, $\vec{b} = 2\vec{i} + 3\vec{k}$. Find the value of $\vec{a} + \vec{b}$

(OR)

- (b) If the centripetal force is of the form $m^a v^b r^c$, find the values of a, b and c using dimensional analysis.
12. (a) Illustrate the importance of the gravitational force on the earth.

(OR)

(b) Illustrate the idea behind the coulomb repulsion in nuclear force.

13. (a) Write a note on linear momentum.

(OR)

(b) Analyse angular momentum.

14. (a) Distinguish between streamline and turbulent flow.

(OR)

(b) Compare the properties of light with sound.

15. (a) Examine the Doppler effect for a stationary source and a moving observer.

(OR)

(b) Inspect the idea of the Mach number in sonic boom.

PART - C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 500 words.

16. (a) Two vectors each with magnitude of 5 units have an angle of 60° between them. Find the magnitude of (i) the sum of the vectors and (ii) the difference of the vectors.

(OR)

(b) The distance covered by a particle in time t is given by $x = a + bt + ct^2 + dt^3$; find the dimensions of a , b , c and d .

17. (a) Explain about the types of forces involved when a book is placed on a table and in contact.

(OR)

(b) Describe the centripetal and centrifugal forces in detail.

18. (a) Analyze the principle of conservation of linear momentum with an example.

(OR)

(b) Examine different types of energy used in our daily life by mentioning any one of its applications.

19. (a) Obtain the equation of the time of flight of a projectile motion of a particle.

(OR)

(b) Obtain the equation for the banking of a curved road.

20. (a) Elaborate on the determination of the velocity of sound in air using the resonance column method.

(OR)

(b) Elaborate on different types of semiconductors.

