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CLASS 11

Physics

Sample Paper 3 - Questions

33 questions | 70 marks | 2026-27

Time: 3 hours. Answer all questions and subparts unless a choice is stated. Marks are shown on the right. Write answers on separate sheets. Independently prepared practice paper.

Section A - Objective questions

1. Which statement correctly describes Dimensional analysis? **1**

(A) Dimensions help test consistency of physical equations.

(B) Velocity changes at a constant rate.

(C) Magnitude and direction determine a resultant.

(D) Total momentum stays constant when net external impulse is zero.

2. Which statement correctly describes Continuity equation? **1**

(A) Steady incompressible flow conserves volume flow rate.

(B) Overlapping small disturbances add in a linear system.

(C) Potential energy per unit mass is defined relative to a chosen reference.

(D) Total momentum stays constant when net external impulse is zero.

3. Which statement correctly describes Newton's second law? **1**

(A) Resultant force equals the rate of change of momentum.

(B) Velocity changes at a constant rate.

(C) Acceleration is proportional to displacement and directed toward equilibrium.

(D) Overlapping small disturbances add in a linear system.

4. Identify the term described by this statement: Overlapping small disturbances add in a linear system. **1**

(A) Conservation of momentum
(B) Vector addition
(C) Superposition
(D) Work-energy theorem

5. Which statement correctly describes Angular momentum? **1**

(A) Resultant force equals the rate of change of momentum.
(B) Rotational momentum depends on configuration and angular motion.
(C) Net work equals the change in kinetic energy.
(D) Contact force adjusts up to a limiting value to oppose impending relative motion.

6. Identify the term described by this statement: Net work equals the change in kinetic energy. **1**

(A) Vector addition
(B) Work-energy theorem
(C) Dimensional analysis
(D) Static friction

7. Which statement correctly describes Gravitational potential? **1**

(A) A body tends to recover after a deforming force is removed within suitable limits.
(B) Contact force adjusts up to a limiting value to oppose impending relative motion.
(C) Potential energy per unit mass is defined relative to a chosen reference.
(D) Velocity changes at a constant rate.

8. Identify the term described by this statement: Contact force adjusts up to a limiting value to oppose impending relative motion. **1**

(A) Static friction
(B) Vector addition
(C) Uniform acceleration
(D) Projectile motion

9. Identify the term described by this statement: Acceleration is proportional to displacement and directed toward equilibrium. 1

(A) First law of thermodynamics

(B) Simple harmonic motion

(C) Torque

(D) Uniform acceleration

10. Which statement correctly describes Projectile motion? 1

(A) Overlapping small disturbances add in a linear system.

(B) Acceleration is proportional to displacement and directed toward equilibrium.

(C) Potential energy per unit mass is defined relative to a chosen reference.

(D) Independent components describe ideal motion under gravity.

11. Which statement correctly describes Vector addition? 1

(A) A body tends to recover after a deforming force is removed within suitable limits.

(B) Magnitude and direction determine a resultant.

(C) Independent components describe ideal motion under gravity.

(D) Energy conservation relates heat, work and internal energy.

12. Which statement correctly describes Conservation of momentum? 1

(A) Independent components describe ideal motion under gravity.

(B) Dimensions help test consistency of physical equations.

(C) Acceleration is proportional to displacement and directed toward equilibrium.

(D) Total momentum stays constant when net external impulse is zero.

13. Identify the term described by this statement: Velocity changes at a constant rate. 1

(A) Continuity equation

(B) Uniform acceleration

(C) Gravitational potential

(D) Superposition

14. Identify the term described by this statement: A body tends to recover after a deforming force is removed within suitable limits. **1**

(A) Angular momentum
(B) Simple harmonic motion
(C) Elasticity
(D) Superposition

15. Which statement correctly describes First law of thermodynamics? **1**

(A) Total momentum stays constant when net external impulse is zero.
(B) Energy conservation relates heat, work and internal energy.
(C) Overlapping small disturbances add in a linear system.
(D) Net work equals the change in kinetic energy.

16. Identify the term described by this statement: The turning effect depends on force and perpendicular lever arm. **1**

(A) Static friction
(B) Newton's second law
(C) Vector addition
(D) Torque

Section B - Short responses

17. A gas receives 480 J of heat and does 380 J of work. Calculate its internal-energy increase. **2**

18. Explain how the following example illustrates Gravitational potential: A mass changes potential as its position in a gravitational field changes. **2**

19. A 36 kg object moves at 5 m/s. Calculate its kinetic energy. **2**

20. Compare Static friction and Elasticity. Give the meaning and an appropriate application of each. **2**

21. A resultant force of 108 N acts on a 36 kg object. Calculate acceleration. **2**

Section C - Short responses

22. Explain how the following example illustrates Projectile motion: Horizontal velocity remains constant when air resistance is neglected. **3**

23. A body starts from rest with acceleration 23 m/s^2 for 4 s. Calculate its displacement. **3**

24. Explain how the following example illustrates Dimensional analysis: An expression for speed must have dimensions of length divided by time. **3**

25. A wave has frequency 380 Hz and wavelength 2 m. Calculate speed. **3**

26. Explain how the following example illustrates Angular momentum: A skater changes rotation speed while approximately conserving angular momentum. **3**

27. A 50 kg object moves at 5 m/s. Calculate its kinetic energy. **3**

28. Explain how the following example illustrates Superposition: Two waves combine to produce a resultant displacement. **3**

Section D - Case and application questions

29. Consider this situation: A straight-track cart gains equal velocity increments in equal times.

(a) Name the concept demonstrated in the case. **1**

(b) Explain the connection between the situation and that concept. **1**

(c) Distinguish that concept from Projectile motion, giving an appropriate feature of each. **2**

30. Consider this situation: A force applied farther from a hinge can produce greater turning effect.

(a) Name the concept demonstrated in the case. 1

(b) Explain the connection between the situation and that concept. 1

(c) Distinguish that concept from Conservation of momentum, giving an appropriate feature of each. 2

Section E - Extended responses

31. (a) Explain Continuity equation and analyse this application: Water speeds up in a narrower section of a pipe. 5
(b) Explain Uniform acceleration and show how this second application fits it: A straight-track cart gains equal velocity increments in equal times.

32. (a) Explain Newton's second law and analyse this application: A known net force produces acceleration of a constant-mass object. 5
(b) Explain Work-energy theorem and show how this second application fits it: A resultant force increases a cart's speed over a distance.

33. (a) Explain Elasticity and analyse this application: A spring returns toward its original length after a small extension. 5
(b) Explain Static friction and show how this second application fits it: A block stays at rest under a small horizontal pull.

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