T
COMMON FIRST REVISION EXAMINATION - JAN. 2025
Standard - XI
PHYSICS

Reg.No. ☐☐☐☐☐☐

Time: 3.00 hrs.   Marks: 70

PART - A

Answer all the questions: 15×1=15

1. The dimensional formula of Planck's constant h is
   a) $[ML^2T^{-1}]$ b) $[ML^2T^{-3}]$ c) $[MLT^{-1}]$ d) $[ML^3T^{-3}]$

2. The number of significant figures is 0.0006032 is
   a) 1   b) 2   c) 3   d) 4

3. The dimension of $(\mu_0\varepsilon_0)^{-\frac{1}{2}}$ is
   a) length   b) time   c) velocity   d) force

4. If a particle has negative velocity and negative acceleration its speed
   a) increases   b) decreases   c) remains same   d) zero

5. If an object is thrown vertically up with the initial speed u from the ground, then the time taken by the object to return back to ground is
   a) $u^2/2g$ b) u^2/g c) $u/2g$ d) $2u/g$

6. Two trains A and B moving along parallel tracks with the same velocity in the same direction. Let the velocity of each train be 50kmh^{-1} due east, then the relative velocities of the train
   a) 0kmh^{-1} b) 10kmh^{-1} c) 20kmh^{-1} d) 50kmh^{-1}

7. Two masses m_1 and m_2 are experiencing the same force where $m_1 < m_2$. The ratio of their acceleration $\frac{a_1}{a_2}$ is
   a) 1   b) less than 1   c) greater than 1   d) all of these

8. If a person moving from pole to equator, the centrifugal force acting on him.
   a) increases   b) decreases
   c) remains the same   d) increases and then decreases

9. Coefficient of static friction for a pair of materials steel and steal
   a) 0.10   b) 0.35   c) 0.75   d) 1.0

10. A ball of mass 1kg and another of mass 2kg are dropped from a tall building whose height is 80m. After a fall of 40m each towards Earth their respective kinetic energies will be in the ratio of
    a) $\sqrt{2} : 1$ b) $1 : \sqrt{2}$ c) $2 : 1$ d) $1 : 2$

11. The workdone by the conservative force for a closed path is
    a) always negative   b) zero   c) always positive   d) not defined

12. If the potential energy of the particle is $\alpha - \frac{\beta}{2}x^2$, then force experienced by the particle is
    a) $F = \frac{\beta}{2}x^2$ b) $F = \beta x$ c) $F = -\beta x$ d) $F = \frac{-\beta}{2}x^2$

13. A couple produces,
   a) pure rotation
   b) pure translation
   c) rotation and translation
   d) no motion

14. A round object of mass M and radius Rrd is down without slipping along an inclined plane. The frictional force.
   a) dissipates kinetic energy as heat
   b) decreases the rotational motion
   c) decreases the rotational and translational motion
   d) converts translational energy into rotational energy

15. Moment of Inertia of a Uniform disc is
   a) $I = MR^2$
   b) $I = \frac{1}{2} MR^2$
   c) $I = \frac{3}{2} MR^2$
   d) $I = 4MR^2$

PART - B

Answer any six questions. Qn.22 is compulsory.   6×2=12

16. What are the advantages of SI system?

17. Define precision and accuracy.

18. How do you deduce that two vectors are perpendicular?

19. Two vectors are given as $\vec{r} = 2\hat{i} + 3\hat{j} + 5\hat{k}$ and $\vec{F} = 3\hat{i} - 2\hat{j} + 4\hat{k}$. Find the resultant vector $\vec{\tau} = \vec{r} \times \vec{F}$

20. Define one Newton.

21. Define Coefficient of restitution.

22. If two objects of masses 2.5kg and 100kg experience the same force 5N, what is the acceleration experienced by each of them?

23. Define centre of gravity.

24. What is the relation between torque and angular momentum?

PART - C

Answer any six questions. Qn.33 is compulsory.   6×3=18

25. What are the limitations of dimensional analysis?

26. A physical quantity x is given by $x = \frac{a^2 b^3}{c \sqrt{d}}$. If the percentage errors of measurement in a, b, c and d are 4%, 2%, 3% and 1% respectively, then calculate the percentage error in the calculation of x.

27. Write the kinematic equations for angular motion.

28. What is projectile? Give examples.

29. Explain various types of friction. Suggest a few methods to reduce friction.

30. Write the various types of potential energy. Explain the formulae.

31. State principle of moments.

32. What is the difference between sliding and slipping?

33. A weight lifter lifts a mass of 250kg with a force 5000N to the height of 5m.

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a) What is the workdone by the weight lifter?
b) What is the workdone by the gravity?
c) What is the networkdone on the object?

PART - D

Answer all the questions: 5×5=25

34. Explain in detail the various types of errors.

(OR)

Convert 76cm of mercury pressure into Nm^{-2} using the method of dimensions.

35. State Triangle law addition and calculate magnitude of resultant vector and direction of resultant vectors.

(OR)

Derive the equation of motion, range and maximum height reached by the particle thrown at an oblique angle θ with respect to the horizontal direction.

36. Prove the law of conservation of linear momentum. Use it to find the recoil velocity of a gun when a bullet is fired from it.

(OR)

Describe the method of measuring angle of repose.

37. State and explain work energy principle. Mention any three examples for it.

(OR)

Arrive at an expression for power and velocity. Give some examples for the same.

38. Derive the expression for moment of inertia of a uniform ring about an axis passing through the centre and perpendicular to the plane.

(OR)

State and Prove perpendicular axis theorem.