Tsl11P

Tenkasi District

Common Quarterly Examination - 2023

22-09-2023

Standard 11

PHYSICS

Time Allowed: 3.00 Hours Maximum Marks: 70

PART - I

**I. Choose the best answer:** **15×1=15**

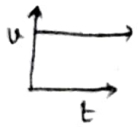
1) The length of a body is measured as 3.51m, if the accuracy is 0.01m, then the percentage error in the measurement is
a) 351% b) 1% c) 0.28% d) 0.035%

2) Planck's constant (h), Speed of light in vacuum (c) and Newton's Gravitational Constant (G) are taken as three fundamental constants. Which of the following combinations of these has the dimension of length?
a) $\frac{\sqrt{hG}}{c^{3/2}}$ b) $\frac{\sqrt{hG}}{c^{5/2}}$ c) $\sqrt{\frac{hc}{G}}$ d) $\sqrt{\frac{Gc}{h^{3/2}}}$

3) The velocity of a particle v at an instant t is given by $v = at+bt^2$. The dimension of a is
a) [L] b) $[LT^{-1}]$ c) $[LT^{-2}]$ d) $[LT^{-3}]$

4) If a particle executes uniform circular motion in the xy plane in clockwise direction, then the angular velocity is in
a) +y direction b) +z direction c) −z direction d) −x direction

5) If one object is dropped vertically downward and another object is thrown horizontally from the same height, then the ratio of vertical distance covered by both objects at any instant is
a) 1 b) 2 c) 4 d) 0.5

6) The velocity - time (v–t) graph representing motion of particle moving with uniform velocity
a) 

b) 

c) 

d) 


7) Force acting on the particle moving with constant speed
a) always zero b) need not be zero
c) always non zero d) cannot be concluded

8) If two masses $m_1$ and $m_2$ are experiencing the same force, then the ratio of respective acceleration is
a) $\frac{a_1}{a_2} = \frac{m_1}{m_2}$ b) $\frac{a_1}{a_2} = 1$ c) $\frac{a_1}{a_2} = \frac{m_2}{m_1}$ d) $\frac{a_1}{a_2} = \sqrt{\frac{m_1}{m_2}}$

9) A stone of mass 0.5 kg tied to a string executes uniform circular motion in a circle of radius 2m with a speed of 4 $ms^{-1}$. The magnitude of tension acting on the stone will be
a) 3N b) 10N c) 0.5N d) 4N

10) A spring of force constant K is cut into two pieces such that one piece is double the length of the other. Then the long piece will have a force constant of
a) $\frac{2}{3}K$ b) $\frac{3}{2}K$ c) 3K d) 6K

11) A ball of mass 1 kg 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

12) The force on a particle as the function of displacement x is given by $F = 9+0.3x$. The workdone corresponding to displacement of particle from x=0 to x=2 unit is
a) 18.6J b) 21J c) 25J d) 9.6J

13) The speed of a solid sphere after rolling down from rest without sliding on an inclined plane of vertical height h is

a) $\sqrt{\frac{4}{3}gh}$ b) $\sqrt{\frac{10}{7}gh}$ c) $\sqrt{2gh}$ d) $\sqrt{\frac{1}{2}gh}$

14) A closed cylindrical container is partially filled with water. As the container rotates in a horizontal plane about a perpendicular bisector, its moment of inertia
a) increases b) decreases
c) remains constant d) depends on direction of rotation

15) The centre of mass for a uniform rod of mass M and length 1/2 (ie) $0.5\ell$ lies at the
a) $\ell$ b) $0.75\ell$ c) $0.5\ell$ d) $0.25\ell$

## PART - II

**II. Answer ANY SIX questions. Q.No. 24 is compulsory:** **6×2=12**

16) Write the uses of Dimensional Analysis.
17) Define - Displacement.
18) Define - Absolute error.
19) State - Lami's theorem.
20) 2.5 kg and 100 kg are the masses of two particles which acts a force of 5N. Calculate the acceleration of each particle.
21) Distinguish between Elastic collision and Inelastic collision.
22) Define - Co-efficient of restitution.
23) State Law of conservation of angular momentum.
24) A train was moving at the rate of 54 km $h^{-1}$ when brakes were applied. It came to rest within a distance of 225m. Calculate the retardation produced in the time.

## PART - III

**III. Answer ANY SIX questions. Q.No. 33 is compulsory:** **6×3=18**

25) Explain Gross Error.
26) Write any three rules for significant figure with examples.
27) State - Triangle law of vector addition.
28) If an object is thrown horizontally with an initial speed $10ms^{-1}$ from the top of a building of height 100m. What is the horizontal distance covered by the particle?
29) To move an object push or pull? Which is easier? Explain with freebody diagram.
30) Deduce the Relation between power and velocity.
31) Compare conservative force and non-conservative force.
32) Deduce the Relation between Torque and Angular Acceleration.
33) A cyclist while negotiating a circular path with speed 20 $ms^{-1}$ is found to bend an angle by 30° with vertical. What is the radius of the circular path? (Given g = 10 $ms^{-2}$)

## PART - IV

**IV. Answer all question in detail:** **5×5=25**

34) Express 76 cm of mercury pressure in terms of $Nm^{-2}$ using the method of dimension. **(OR)**
Compare the special features of static friction and kinetic friction.

35) Show that path of projectile is parabola when the projectile is projected horizontal motion. **(OR)**
State and Explain work-energy theorem.

36) What is Parallax method? How will you measure the diameter of the moon using Parallax method? **(OR)**
State and Explain Parallel axes theorem.

37) Write three newton's laws of motion.
**(OR)**
Explain loss of kinetic energy in Inelastic collision.

38) Derive equations of uniformly accelerated motion by calculus method.
**(OR)**
Obtain the expression for moment of inertia of uniform rod.

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