FIRST QUARTERLY TEST AUGUST 2024

CLASS : I PUC   **SUBJECT : PHYSICS (33)**   **Max. Marks : 35**
TIME : 1 Hr. 30 Mins.

General Instructions :
1) All parts are compulsory.
2) Answers without relevant diagram/figure/circuit wherever necessary will not carry any marks.
3) Direct answers to the Numerical problems without detailed solutions will not carry any marks.
4) For Part-A questions, only the first written answer will be considered for evaluation.

PART-A

I   Pick the correct option among the four given options for all of the following questions:

7 x 1 = 7

1) The dimensions of kinetic energy is same at that of
   a) force   b) pressure   c) work   d) momentum

2) The number of significant figures in number 0.0034 is
   a) 2   b) 3   c) 4   d) 5

3) A body starts from rest and travels with an acceleration of $2\,ms^{-2}$. After t seconds its velocity is $10\,ms^{-1}$. Then t is
   a) 20s   b) 10s   'c) 5s   d) 0.2s

4) The acceleration of a body moving with constant velocity is
   a) +ve   b) −ve   c) zero   d) infinite

5) A body travel along a circumference of a circle of radius 2m with linear velocity of $6\,ms^{-1}$. Then its angular velocity is
   a) $6\ rad\,s^{-1}$ b) $4\ rad\,s^{-1}$ c) $3\ rad\,s^{-1}$ d) $2\ rad\,s^{-1}$

6) Inertia of rest of a body is a measure of
   a) mass   b) velocity   c) momentum   d) energy

7) The principle of Rocket motion is
   a) Law of conservation of mass
   b) Law of conservation of linear momentum
   c) Law of conservation of charge
   d) None of the above

II   Fill in the blanks by choosing appropriate answers given in the brackets for all the following questions:

3 x 1 = 3

(radian, steradian, friction, projectile)

8) The SI unit of solid angle is _____.

9) The motion of a bullet fired from the gun is example for _____.

10) While a vehicle is taking a turn, _____ between the tyres and the road provides the centripetal force.

(P.T.O.)

PART-B

III   Answer any TWO of the following questions :   2x2=4

11)   Write the dimensional formula of (i) force and (ii) power.

12)   Draw v-t graph for
      a) motion in the air with +ve acceleration.
      b) motion in the air with –ve acceleration.

13)   State and Explain triangle law of addition of vectors.

14)   Define impulse of a force. Mention its SI unit.

PART-C

IV   Answer any TWO of the following questions :   2x3=6

15)   Check the correctness of the equation $V^2 - V_0^2 = 2ax$ by the method of dimension, where V_0 – initial velocity V = final velocity, a = uniform acceleration and x = distance travelled.

16)   What is resolution of a vector ? Give the rectangular components of $\vec{F}$ making an angle θ with X axis.

17)   Prove the law of conservation of linear momentum in case of two bodies colliding with each other along straight line.

18)   Mention any three advantages of friction.

PART-D

V   Answer any TWO of the following questions :   2x5=10

19)   What is V-t graph ? Derive $x = V_0 t + \frac{1}{2} at^2$ by using V-t graph, where the symbols have their usual meaning.

20)   Show that trajectory of projectile is parabola.

21)   What is centripetal acceleration ? Derive an expression for centripetal acceleration of a body executing uniform circular motion.   https://www.karnatakaboard.com

22)   State Newton's II law of motion. Hence derive the relation $\vec{F} = m\vec{a}$, where the symbols have their usual meaning.

VI   Answer any ONE of the following questions :

23)   Derive an expression for time period of oscillation of simple pendulum, which depends upon mass of the bob(m), length of the pendulum (*l*) and acceleration due to gravity (g) using method of dimensions.

24)   A car moving along a straight highway with speed of 126 kmh⁻¹ is brought to stop within a distance of 200m. What is the acceleration of car and how long does it take for the car to stop ?

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