

Standard 11

PHYSICS

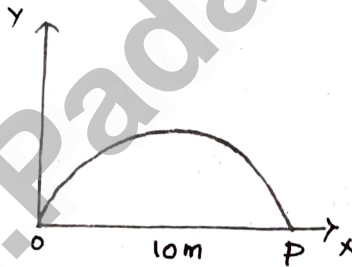
Time: 1.30 Hrs.

Marks: 50

I. Choose the correct answer:

10×1=10

- The number of significant figures in 0.0006032 m^2 is
a) 7 b) 8 c) 4 d) 3
- The density of wood is 0.5 g cm^{-3} . The value of density in S.I. system is
a) 5 kg m^{-3} b) 500 kg m^{-3} c) 50 kg m^{-3} d) 5000 kg m^{-3}
- The velocity of a particle 'v' at an instant 't' is given by $v = at + 6t^2$.
The dimension of b is
a) [L] b) $[L^1T^{-1}]$ c) $[L^1T^{-2}]$ d) $[L^1T^{-3}]$
- Which of the following pairs of physical quantities have same dimension?
a) force and torque b) torque and power
c) torque and energy d) force and power
- Which of the following is an example of dimensional constant?
a) Gravitational constant b) Refractive index
c) Velocity d) Numbers
- If the velocity is $\vec{v} = 2\hat{i} + t^2\hat{j} - 9\hat{k}$, then the magnitude of acceleration at $t = 0.5$ second is
a) 1 ms^{-2} b) 2 ms^{-2} c) zero d) -1 ms^{-2}
- An object travelling in a semicircular path from O to P in 5 second. The distances travelled is



- 3.14 m b) 6.28 m c) 15.70 m d) zero
- Which of the following physical quantity cannot be represented by a scalar?
a) mass b) length
c) momentum d) magnitude of acceleration
 - If an object is dropped from the top of a building and it reaches the ground at $t = 4$ second, then the height of the building is (assume $g = 9.8 \text{ ms}^{-2}$)
a) 77.3 m b) 78.4 m c) 80.5 m d) 79.2 m
 - Which of the following statement is correct, if one ball falls vertically and another ball is projected horizontally from the top of a building?
a) both the balls will reach the bottom at the same time
b) both the balls will reach the bottom at the different time
c) the ball projected horizontally will reach first
d) the ball which fall vertically will reach first

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II. Answer any SIX of the following questions:

6×2=12

[Q.No. 19 is compulsory]

- 11) What are fundamental and derived quantities?
- 12) Check the equation $V = u + at$ is dimensionally correct (or) not.
- 13) What are dimensional constants? Give examples.
- 14) What are scalars and vectors?
- 15) Define distance and displacement.
- 16) Define linear momentum of a particle.
- 17) If \vec{A} and \vec{B} are given as $\vec{A} = 5\hat{i} + 7\hat{j} - 4\hat{k}$ and $\vec{B} = 6\hat{i} + 3\hat{j} + 2\hat{k}$, then find $\vec{B} - \vec{A}$.
- 18) Write any two rules for rounding off.
- 19) An iron ball is falling from a height of 10m. Find the time taken by the iron ball to reach the ground.

III. Answer any SIX of the following questions:

6×3=18

[Q.No. 28 is compulsory]

- 20) What are the limitations of dimensional analysis?
- 21) Define precision and accuracy. Discuss with one example.
- 22) Write a note on Gross error.
- 23) Write any three rules for counting significant figures with examples.
- 24) An object is projected at an angle such that the horizontal range is 4 times of the maximum height. What is the angle of projection of the object?
- 25) Show that $\vec{v} = \vec{r} \times \vec{\omega}$ in the case of circular motion.
- 26) Write a note on vector product of two vectors.
- 27) Explain what do you mean by components of a vector.
- 28) A train was moving at the rate of 54 km h^{-1} , when brakes were applied. It comes to rest within a distance of 225m. Calculate the retardation produced in the train.

IV. Answer the following questions in detail:

2×5=10

- 29) Obtain an expression for the time period T of a simple pendulum by the method of dimensions. T depends on mass m , length l and acceleration due to gravity $K = 2\pi$. **(OR)**
 State and prove triangle law of vector addition. Derive expression for resultant vector and its direction.
- 30) Describe the triangulation method and parallax method to determine the large distances. **(OR)**
 Derive equations for uniformly accelerated motion by calculus method.