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I UNIT SAMPLE PAPER
2025-2026
STD:- XI

Sub:- Physics **Time:- 2 Hours**
Date :- **Marks:- 50**

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General Instructions:

(1) All questions are compulsory. There are 25 questions in all.
(2) This question paper has five sections: Section A, Section B, Section C, Section D and Section E. All the sections are compulsory.
(3) Section A contains thirteen questions of 1 mark each with Eleven MCQs and Twoassertion and reasoning questions, Section B contains four questions of 2 marks each,Section C contains five questions of 3 marks each, Section D contains two long answer questions of 5 marks each and Section E contains one case study-based question of 4 marks each.
(4) There is no overall choice. However internal choice is provided. You have to attemptonly one of the choices in such questions.
Read the following instructions carefully

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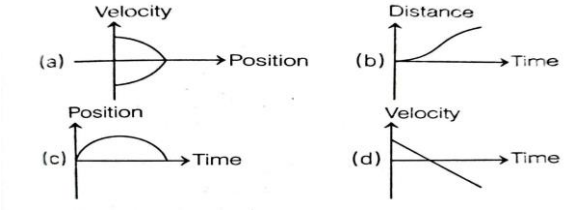
SECTION A

1 State the number of significant figures in the following 1M
(a) 458.210 b)0.5430 c)307000 m d) 9.1×10^{-31}

2. Equation of state for a real gas is given by $(P + a/V2)(V-b) = RT$,(P-pressure,V-volume) The dimension of the constant a is 1M

(a) $[ML^5T^{-2}]$ (b) $[M^{-1}L^5T^2]$
(c) $[ML^{-5}T^{-1}]$ (d) $[ML^5T^{-1}]$

3. All the graphs below are intended to represent the same motion.one of them does it incorrectly.Pick it up. 1M

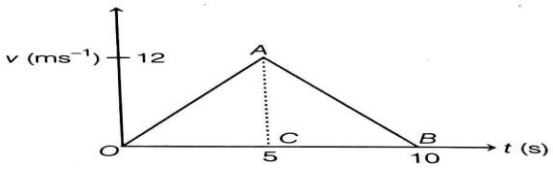


4. A ball is dropped from the top of a building 100 m high. At the same instant another ball is thrown upwards with a velocity of 40 m/s from the bottom of the building. The two balls will meet after 1M

A) 5s B) 2.5 s C) 2s D) 3s

5. In which of the following pairs the two physical quantities have different dimensions 1M
A)Planck's Constant and angular momentum
B)impulse and linear momentum.
C)moment of inertia and moment of force
D) energy and torque

6. The speed-time graph of a particle moving along a fixed direction as shown in figure.The distance traversed by the particle between t= 0 s to t=10 s is 1M
A) 20m B)40 m C)60 m D)80 m



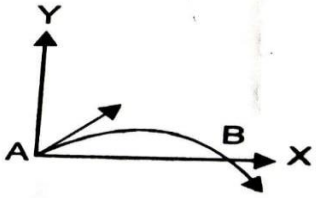
7. The resultant of two forces 3P and 2P is R.If the first force is doubled,then the resultant is also doubled,The angle between the two forces is 1M
A) 120^0 B) 60^0 C) 180^0 D) 90^0

8. The force is given in terms of time t and displacement y by the equation: 1M
F=A cos By + C sin Dt
Write the dimensions of $\frac{D}{B}$?
a) $M^0L^{-1}T^{-1}$ b)$M^0L^{-1}T^1$ c)$M^0L^1T^{-1}$ d) $M^1L^{-1}T^{-1}$

9. If velocity (V) ,time (T) and force(F) are chosen as fundamental quantities, then dimensions of mass will be 1M
a) $[F^{-1}T^1V^1]$ b) $[F^{-1}T^{-1}V^1]$ c) $[F^1T^1V^{-1}]$ d)$[F^1T^{-2}V^{-1}]$

10. Two projectiles are projected with the same velocity. If one is projected at an angle of 30^0 and the other at 60^0 to the horizontal, then the ratio of maximum height reached, is 1M
(a) 3:1 (b) 1:3 (c) 1:2 (d) 2:1

11. ***The velocity of a projectile at the initial point A is*** $(2\hat{i} + 3\hat{j})$ ***m*** s^{-1}***. Its velocity (in m*** s^{-1}***) at point B is*** 1M
(a) $2\hat{i} - 3\hat{j}$
(b) $2\hat{i} + 3\hat{j}$
(c) $-2\hat{i} - 3\hat{j}$
(d) $-2\hat{i} + 3\hat{j}$



For question numbers 13 to 16, two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

a) Both Assertion and Reason are true and Reason is the correct explanation of A
b) Both Assertion and Reason are true but R is NOT the correct explanation of A
c) Assertion is true but Reason is false
d)Assertion is false and Reasonis true.
e) both Assertion and Reason are false

12 Assertion-A body is momentarily at rest the instant it reverses direction. 1M
Reason-A body cannot have acceleration if its velocity is zero at a given instant of time
ans c

13 **Assertion:** In case of projectile motion. The magnitude of the rate of change of velocity is variable. 1M
Reason: In projectile motion, magnitude of veloicity first decreases and then increases during motion.
ANS D

SECTION B

14 The age of the universe is $5x10^{17}$ s . Find the age of the universe in years. 2M

15 Show that A= -6i+9j-12k and B= 2i-3j+4k , are parallel to each other**.** 2M

16 Convert the value of G = $6.66x10^{-11}$ $Nm^2 kg^{-2}$ into CGS system 2M

17. An insect trapped in a circular groove of radius 12 cm moves along the groove steadily and completes 7 revolutions in 100 s. (a) What is the angular speed, and the linear speed of the motion? 2M

SECTION- C

18 Derive the three equations of motion for an object moving with constant acceleration along a straight line. 3M

19 A particle starts from the origin at t = 0 s with a velocity of 10.0 j m/s and moves in the x-y plane with a constant acceleration of (8.0+ 2.0) j m s^{-2}. (a) At what time is the x- coordinate of the particle 16 m? What is the y-coordinate of the particle at that time? (b) What is the speed of the particle at the time ? 3M

20 Given that the period T of oscillation of a gas bubble from an explosion under water depends on P, d and E, where P is the pressure,d is the density of water and E is the total energy of the explosion .Find a relation for T dimensionally. 3M

OR

The frequency of vibration (n) of a string depends upon length (l) of the string, tension (T) in the string and mass per unit length (m) of the string.

Use method of dimensions for establishing the relation for n.

21 H+H'=$u^2/2g$ where H and H' are height attained by projectile particle for two complementary angles 3M

b)Prove that projectile motion follows trajectory

22 a)State the parallelogram law of vectors. Find its magnitude as well as direction 3M

OR

a)Under what conditions does the equality=|A-B| hold good?

23 Derive an expression for the trajectory, range, height, Time of flight for a projectile being projected with angle of projection with respect to the horizontal. 5M

OR

a)A ball is thrown at angle θ and another ball is thrown at an angle (90-θ) with the horizontal direction from the same point with a velocity 39.2 ms^{-1} .The second ball reaches 50 m higher than the first ball. Find their individual heights and ranges. Take g = 9.8 ms^{-2}.

b) obtain expression of radial acceleration,

24 A calorie is a unit of heat energy and it equals about 4.2 J, where 1 J= 1kg m^2s^{-2}.Suppose we employ a system of units in which the unit of mass equal 5M

α □□, the unit of length equals to □ □, the unit of time is γ s. Show that a calorie has a magnitude 4.2 $\alpha^{-1}\beta^{-2}\gamma^2$.

OR

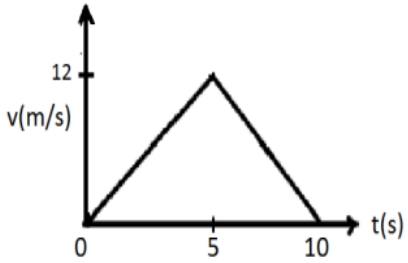
The frequency of vibration (n) of a string depends upon length (l) of the string, tension (T) in the string and mass per unit length (m) of the string.

Use method of dimensions for establishing the relation for n.

SECTION D

CASE STUDY BASED QUESTION

25 The time rate of change of position of the object in any direction is called speed of the object If an object covers equal distances in equal intervals of time, then its speed is called uniform speed and if it covers unequal distances in equal intervals of time, then its speed is called non uniform or variable speed. The ratio of the total distance travelled by the object to the total time taken is called average speed of the object. The speed may be positive or zero but never negative. The speed-time graph of a particle moving along a fixed direction is shown in the following Fig. 4M



(i) Distance travelled by the particle between 0 to 10 seconds
(a) 60 m (b) 50 m (c) 120 m (d) zero

(ii) Average speed between time interval 0 to 10 s
(a) 12 m/s (b) 6 m/s (c) 10 m/s (d) 60 m/s

(iii) The time when the speed was minimum
(a) at t = 0 s and t = 5 s (b) at t = 5 s and t = 20 s (c) at t = 5 s and t = 10 s
(d) at t = 0 s and t = 10 s

(iv) The time when speed was maximum
(a) t = 0 s (b) t = 5 s(c) t = 10 s (d) t = 12 s

(v) Speed is positive at time interval
(a) t = 0 to t = 5 s (b) t = 5 to t = 10 s (c) t = 0 to t = 10 s (d) All of these

BLUE PRINT OF I UNIT TEST

Chapter	1 M	2 M	3M	4M	5M	Total
Unit and Measurement	1(5)=5	2(2)=4	3(1)=3		5(1)=5	17
Motion in st line	1(3)=3		3(3)=9	4(1)=4		16
Motion in a plane	1(5)=5	2(2)=4	3(1)=3		5(1)=5	17
Total	1x13=13	2x4=8	3x5=15	4x1=4	5x1= 5	