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QUESTION PAPER FOR CLSASS XI CBT AUGUST 2023- 24

CLASS :- XI

SUBJECT :- PHYSICS

TOPIC: UNITS AND MEASUREMENTS, MOTION IN A STRAIGHT LINE

CASE STUDY – I

DIMENSIONS

the nature of a physical quantity is described by its dimensions. All the physical quantities represented by derived units can be expressed in terms of some combination of seven fundamental of base quantities. We shall call these base quantities as the sevendimensions of the physical world, which are denoted with square brackets [ ]. thus, lengthhas the dimension [L], mass [M], time [l'], electric current [A], thermodynamic temperature[K], luminous intensity [cd], and amount of substance [mol]. the dimensions of a physical quantity are the powers (of exponents) to which the base quantities are raised to represent that quantity. Note that using the square brackets [ ] found a quantity means that we are dealing with 'the dimensions of' the quantity. In mechanics, all the physical quantities can be written in terms of the dimensions [L], [M] and [T]. For example, the volume occupied by an object is expressed as the product of length, breadth and height,of three lengths. Hence the dimensions of volume are [L] × [L] × [L] = [L^3].

Q1. **Dimensions of work is** *

- 1 in mass, 2 in length and 2 in time1 in
- mass, 2 in length and -2 in time 1 in
- mass, 2 in length and -3 in time1 in mass,
- -2 in length and 2 in time

Ans - b

Feedback – Dimension of work is given by $[M^1L^2T^{-2}]$

Q2. W**hich of the two quantities have same dimensional formula -** *

- momentum and impulse
- work and force
- density and acceleration
- force and pressure

Ans - a

Feedback : Dimension of momentum = Dimension of mass × velocity = $[M^1]\times[L^1T^{-1}] = [M^1L^1T^{-1}]$

Dimension of impulse = force ×time = $[M^1L^1T^{-2}][\ T^1\ ] = [M^1L^1T^{-1}]$

Q3. **If a formula is dimensionally correct then it can be concluded that:** *

- formula contains dimensionless constant
- formula contains exactly one term in RHS
- formula contains exactly two terms in RHS
- formula may or may not be correct.

Ans - d
Feedback - Dimensionally correct formula does not mean that formula is correct.

Q4. An acceleration of 18 meter per minute square is equal to *

- 1 cm per minute square
- 0.5 cm per second square 1
- cm per second square
- 0.5 cm per minute square

Ans - b
Feedback - 18 m/s^2 = 18× 100 cm/ 3600 s^2 = 0.5 meter per second sq

MOTION IN A PLANE

If an object moving along the straight line covers equal distances in equal intervals of time, it is said to be in uniform motion along a straight line. Distance and displacement are two quantities that seem to mean the same but are different with different meanings and definitions. Distance is the measure of actual path length travelled by object. It is scalar quantity having SI unit of meter while displacement refers to the shortest distance betweeninitial and final position of object. It is vector quantity. the magnitude of the displacement for a course of motion may be zero but the outspending path length is not zero.

When an object moves along a straight line with uniform acceleration, it is possible to relate its velocity, acceleration during motion and the distance covered by it in a certain time interval by aset of equations known as the equations of motion.

Q5. **For rectilinear motion displacement can be** *

- a) Positive only
- b) Negative only
- c) Can be zero
- d) All of the above

Ans - d
Feedback - displacement can be negative , positive and zero.

Q6. **The brakes applied to a car produces an acceleration of 10 m/s2 in the opposite direction to the motion. If the car takes 2 s to stop after the application of brakes, calculate the distance traveled during this time by car.** *

- 15 m
- 10 m
- 25 m
- 20 m

Ans - d

Feedback - v=u + at , 0 = u + 10×2 u = 20 m/s

S = $(v^2 – u^2)/2a$ = $(0^2 – 20^2)/20$ = 20 m

Q7. **The area under velocity time graph gives** *

- a) Displacement over given time interval
- b) Acceleration
- c) Velocity
- d) None of these

Ans - a

Feedback - Area under the graph represents Displacement.

Q8. **A bullet hits a Sand box with a velocity of 10 m/s and penetrates it up to a distance of 25 cm. Find the deceleration of the bullet in the sand box** *

- 500 m/s2
- 200 m/s2
- 1000 m/s2
- 750 m/s2

Ans - b

Feedback - S = $(v^2 – u^2)/2a$, 25 = $(0^2 – 10^2)/2a$ this gives a = 200 m/s2

Assertion and Reasoning

Q9. **Assertion :** When we change the unit of measurement of a quantity, its numerical value changes. *

Reason : Smaller the unit of measurement smaller is its numerical value.

- (A) Both A and R are true and R is the correct explanation of A.
- (B) Both A and R are true but R is not the correct explanation of A.
- (C) A is true but R is false.
- (D) A is false and R is also false.

Ans - c

Feedback - assertion is correct but reason is false.

Q10. **Assertion :** The velocity of a vertically upward thrown ball decreases as it goes upward. *

Reason : The acceleration of the ball at its highest point is not zero even if its

velocity is zero.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false and R is also false.

Ans - b

Feedback - assertion is correct and reason is correct but it is not the correct explanation.

Answer Key AUGUST Month CBT Physics XI

Q No	Answer
1	b
2	a
3	d
4	b
5	d
6	d
7	a
8	b
9	c
10	b

Feedback:

1. Average score in this test is 5.38/10
2. Question 1,2,5 and 7 are scored by most of the students,
3. Question 4 is scored by least No of students.
4. Median marks scored by students is 5