I   MULTIPLE CHOICE QUESTIONS

1. A particle is moving in a circular path of radius 'r'. The displacement after half a circle would be.

   (a) Zero   (b) πr (c) $2r$ (d) $2\pi r$

2. Slope of a velocity-time graph gives.

   (a) the distance   (c) the acceleration

   (b) the displacement   (d) the speed.

3. Suppose a boy is enjoying a ride on a merry-go-round which is moving with a constant speed of 10 m/s. It implies that the boy is.

   (a) at rest   (c) in accelerated motion

   (b) moving with no acceleration   (d) moving with uniform velocity

4. Area under a (v-t) graph represents a physical quantity which has the unit.

   (a) m^2 (c) m^3

   (b) m (d) m/s

5. In which of the following cases of motions, the distance moved and the magnitude of displacement are equal?

   (a) If the car is moving on straight road

   (b) If the car is moving in circular path.

   (c) The pendulum is moving to and fro.

   (d) The earth is revolving around the sun.

II   SHORT ANSWER QUESTIONS.

1. The displacement of a moving object in a given interval of time is zero. Would the distance travelled by the object also be zero? Justify your answer.

2. Suppose you walk across a room of length 9m with a velocity of one and half kilometre per hour. Express this

across the room.   [21.6 s]

3. An object travels 16m in 4s and then another 16m in 2s. what is the average speed of the object?   (5.33 m/s)

4. A car travelling at 36 km/h speeds up to 72 km/h in 5 seconds. what is its acceleration? If the same car stops in 20 seconds, what is the retardation. [$2 m/s^2$, $-1 m/s^2$]

5. A car accelerates uniformly from 18 km/h to 36 km/h in 5 seconds. Calculate (i) the acceleration (ii) the distance covered by the car in that time   [$1 m/s^2$, 37.5 m]

6. A body is accelerating at a constant rate of $10 m/s^2$. If the body starts from rest, how much distance will it cover in 2 seconds?   [20 m]

II   LONG ANSWER QUESTIONS-

1. The graph in figure shows the positions of a body at different times. Calculate the speed of a body as it moves from
(i) A to B   (ii) B to C
(iii) C to D
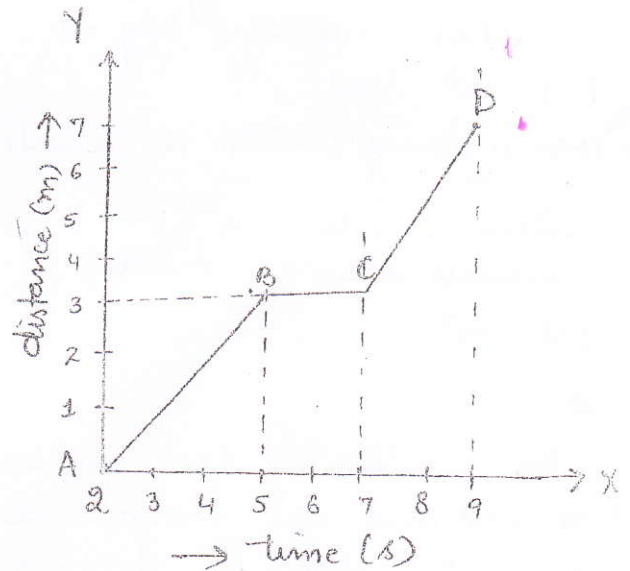
2. The velocity-time graph of an ascending passenger lift is given in figure. What is the acceleration of the lift.
(i) during the first two seconds.
(ii) between 2nd and 10th second
(iii) during the last two seconds.
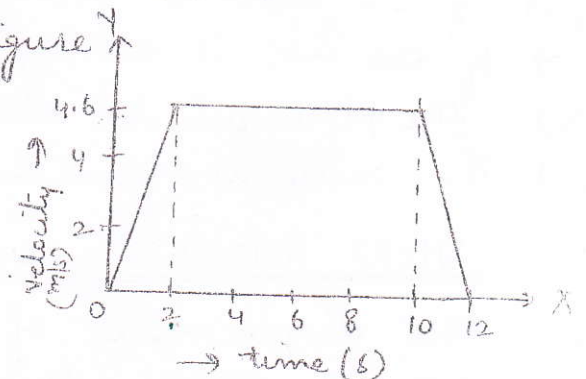
3. The brakes applied to a car produce an acceleration of $6 m/s^2$ in the opposite direction to the motion. If the car takes 2s to stop after the application of brakes, calculate the distance it travels during this time.   [12 m]

DAV INTERNATIONAL SCHOOL
ASSIGNMENT NO. 3

SUBJECT: PHYSICS   **CLASS : 9th**
CHAPTER: FORCE AND LAWS OF MOTION   **DATE:**

I. MULTIPLE CHOICE QUESTIONS:

1. According to the third law of motion, action and reaction
   a) Always act on the same body
   b) Always act on different bodies in opposite directions
   c) Have same magnitude and directions.
   d) Act on either body at normal to each other

2. The inertia of an object tends to cause the object
   a) To increase its speed   c) To decrease its speed
   b) To resist any change in its state of rest or motion

3. The physical quantity which is a product of mass and velocity of a body is known as:
   a) Inertia   b) Momentum   c) Force   d) Change in momentum

4. The law that defines force and inertia is
   a) 1st law   b) 2nd law   c) 3rd law   d) none

5. A swimmer swims due to
   a) Forward push of water on the swimmer   c) either a or b
   b) Buoyancy of water   d) none of above

II. GIVE ONE WORD ANSWER FOR THE FOLLOWING:

1. Law stating action and reaction are equal and opposite.
2. Product of mass and acceleration?
3. The masses of 2 objects are 2kg and 20kg. which has greater inertia?
4. Force is a scalar or vector quantity?
5. What is the S.I unit of momentum?

III. ANSWER THE FOLLOWING QUESTIONS:

1. Momentum of a body of mass 4kg is 24kgm/s. Find its velocity.
2. There are three solids made up of aluminium, steel, and wood, of the same shape and same shape and same volume. Which of them would have highest inertia?
3. A feather of mass 10g is dropped from a height. It is found to fall down with a constant velocity. What is the net force acting on it?
4. What is the momentum of a man of mass 75kg when he walks with a velocity of 2m/s.
5. What is acceleration produced by a force of 12N exerted on an object of mass 3kg?

6. A body of mass 2kg moving with a velocity of 10m/s is brought to rest in 5 sec. calculate the stopping force applied.

7. What would be the force required to produce an acceleration of $2m/s^2$ in a body of mass 12kg? What would be the acceleration if the force were doubled?

8. It is easier to push an empty box than to push the box full of books. Why?

9. When two bodies A and B interact with each other, A exerts a force of 10N on B, towards east. What is the force exerted by B on A?

10. The car A of mass 1500kg , travelling at 25m/s collides with another car B of mass 1000kg travelling at 15m/s in the same direction. After collision , the velocity of car A becomes 20m/s. calculate the velocity of car B after collision.   (22.5m/s)

11. A 10g bullet is shot from a 5kg gun with a velocity of 400m/s. what is the speed of recoil of the gun?   (-0.8m/s)

12. A 150g ball travelling at 30m/s strikes a palyer's hand and is stopped in 0.06sec. find the time taken by the body to move through a distance of 12m.   (-75N)

13. Calculate the force required to impart a car a velocity of 30m/s in 10sec. the mass of car is 1500kg.   (4500N)

14. A motorcar is moving with a velocity of 108km/hr and it takes 4sec to stop after the brakes are applied. Calculate the force exerted by the brakes on the motorcar if its mass alongwith the passenger is 1000kg.   (-7500N)

15. Which would require a greater force : accelerating a 2 kg mass at 5m/s^2 or a mass at $2m/s^2$.

IV.   VALUE BASED QUESTION:

1. A body at rest continues to be at rest unless some external force is applied to move it. Rather, the body at rest opposes the force that tends to move it. Left to itself, the body at rest, will never start moving. This is well known property of inertia of rest of bodies,we study in physics.
   Read carefully the above passage and answer the following questions:
   a) When a bus starts moving suddenly, the passengers tend to fall backwards. Why?
   b) Give one more example of inertia of rest.
   c) What values do you inculcate in life from this study?

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DAV INTERNATIONAL SCHOOL
ASSIGNMENT NO. 3

SUBJECT: PHYSICS   CLASS : IX

CHAPTER: FLOATATION   DATE:

I. **MULTIPLE CHOICE QUESTIONS:**

1. The density of a substance is defined as:

   (a) Density = volume/mass   (b) Density = volume/(mass)^2

   (c) Density = mass/volume   (d) Density = (volume)^2/mass

2. The S.I. unit of density is:

   (a) Kg/m   (b) Kg/m^3 (c) Kg/m^2 (d) Kg

3. By doubling the mass of a solid body, its density becomes.

   (a) 2 times   (b) $\frac{1}{2}$ (c) 4 times   (d) remains the sam.

4. A ship can easily sail on sea water due to the reason that:

   (a) Salty water is denser than ordinary water

   (b) Salty water is lighter than ordinary water

   (c) Salty water contains salt

   (d) Salty water is calm as compared to ordinary water.

II. **GIVE ONE WORD ANSWER FOR THE FOLLOWING:**

1. Name two factors on which the buoyant force acting on an object depends.

2. What is the relationship between buoyant force on an object and the liquid displaced by it?

3. An object weighs 9.8N in air and 9.0N when fully immersed in water. How much is the buoyant force on an object?

III. **ANSWER THE FOLLOWING QUESTIONS:**

1. Why is it easier to swim in sea water than in river water?

2. What is thrust? How is it related to pressure? Give their units.

3. Discuss three important practical aspects of pressure related to daily life.

4. A wooden block of dimensions of 10cm X 20cm X 50cm weighs 6.5kg. calculate the density of the block.

5. A solid body of mass 4.0 X 10^{3}kg and volume 2m^2 is put in water. Will the body float or sink?

IV. **VALUE BASED QUESTIONS**

1. Air is a fluid and our bodies displace air. As a result of this, a buoyant force is acting on each one of us.

   (a) What is the approximate density of your body?

   (b) What is your approximate volume?

   (c) Estimate the magnitude of the buoyant force on your due to the air displaced. Consider your mass to be 75kg.

   (d) Does it mean that your weight is more than the scale reading?