

INTERNATIONAL INDIAN SCHOOL, RIYADH.

PERIODIC TEST -2

WORKSHEET-2017-18

SUBJECT: PHYSICS

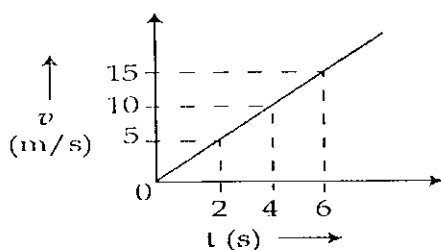
STD: IX

CHAPTER-9

FORCE AND LAWS OF MOTION

1. A water sprinkler used for grass lawn begins to rotate as soon as water supplied explain on which principle it works?
2. A man throws a ball of mass 0.5 kg vertically upward with a velocity of 25 m/s.
Find:
 - (a) The initial momentum of the ball
 - (b) Momentum of the ball at the half way mark of the maximum height (given $g=10 \text{ m/s}^2$)
3. (a) State Newton's second law of motion. Apply this law to obtain the unit of force and define it.
(b) State the Law of Conservation of Momentum. Apply this law to explain the recoil of a gun, when a shell is fired from it.
4. "A boatman pushes the river bank with a bamboo pole to take his boat into the river." Explain his action with reason.
5. (a) State the law of conservation of linear momentum.
(b) A ball of mass 100 g moving with velocity 10 m/s is stopped by a boy in 0.2 s. Calculate the force applied by the boy to stop the ball.
6. a) Define momentum of a body.
(b) A ball is thrown vertically upward. What is its momentum at the highest point?
7. (a) Write the three essential characteristics of the forces to be classified as Action-reaction forces.
(b) A cannon of mass 1000 kg launches a cannonball of mass 10 kg at a velocity of 100 m/s. At what speed will the cannon recoil?

8. Two bodies A & B of the same mass are moving with velocities v and $3v$ respectively.
Compare their (a) inertia (b) momentum (c) the force needed to stop them in the same time.
9. Name the property by virtue of which a body resists a change in its state of motion. Name the physical quantity which is a measure of this property.
10. A bullet of mass 10 g moving with a velocity of 400m/s gets embedded in a freely suspended wooden block of mass 900 g What is the velocity acquired by the block ?
11. A body of mass 60 kg has a momentum of 300 kg m/s. Calculate its velocity.
12. When a person jumps from a building directly and another with a parachute put on, why does the latter not get hurt while the former is hurt?
13. If the mass of a body is doubled, what happens to its acceleration when acted upon by the same force? Justify your answer.
14. Explain with reasons:
- When a shot is fired from a gun the gun recoils.
 - A jet aero plane releases a lot of hot gases before taking off.
 - We press the ground while walking forward.
 - A rubber ball rebounds when struck against a hard floor.
15. The motion of a body of mass 5 kg is shown in the v - t graph.
Find from graph –
- its acceleration
 - the force acting on the body
 - the change in momentum of the body 2 seconds after start



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CHAPTER-8

MOTION

1. What is the numerical ratio of average velocity to average speed of an object when it is moving along a straight line?
2. An object is moving in a circle of radius r calculate the distance and displacement
 - a) when it completes half of the circle and
 - b) when it completes one full circle
3. A body starts rolling over a horizontal surface with an initial velocity of 0.5 m/s due to the friction its velocity decreases at the rate of 0.05 m/s^2 . How much time will it take for the body to stop?
4. Can an object be accelerated if it is moving with constant speed? If yes, explain giving examples.
5. Name the 2 physical quantities apart from velocity and time which can be obtained from velocity-time graph.
6. The driver of a moving car suddenly sees ahead a very old man on the middle of the road. To save the old man he applied the brake, which produces an acceleration of 4 m/s^2 in opposite direction to the motion. After 3 seconds car comes to rest.
 - (i) Calculate the initial velocity and the distance travelled by the car before stopping.

(ii) If the old man is 20m away from the car, would the driver succeed to save the old man?

(iii) What value does the car driver shows?

7. A scooter acquires a velocity of 36km/hr in 10 seconds just after the start. It takes 20 seconds to stop. Calculate the acceleration in the two cases.
8. On a 120 km track, a train travels the first 30 km at a uniform speed of 30 km/h. How fast must the train travel the next 90 km so as to average 60 km/h for the entire trip?
9. A body moves with a velocity of 2 m/s for 5 s, then its velocity increases uniformly to 10 m/s in next 5 s. Thereafter its velocity begins to decrease at a uniform rate until it comes to rest after 5 s.
- (a) Plot a velocity - time graph for the motion of the body.
- (b) From the graph find the total distance covered by the body after 2 s and 12 s.
10. A car is moving on a straight road with uniform acceleration. The following table gives the speed of the car at various instant of Time:

Time(t)	0	10	20	30	40	50
Speed(m/s)	5	10	15	20	25	30

Draw the speed time graph choosing a convenient scale. Determine from it

(i) the acceleration of the car (ii) the distance travelled by the car in 50sec.

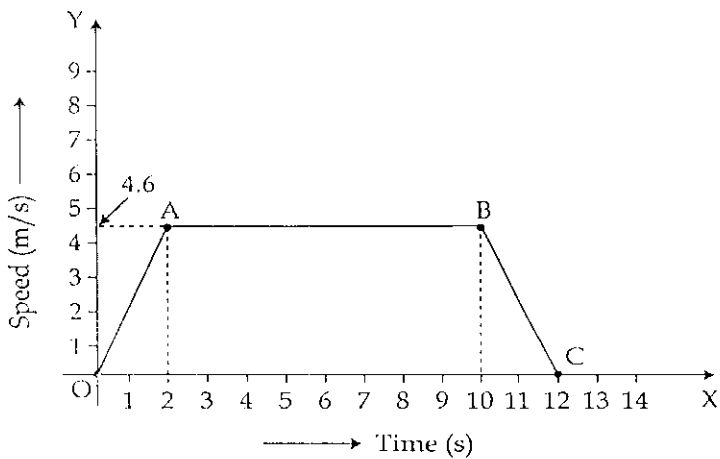
11. A car is moving with a uniform velocity of 10m/s. The driver of the car decides to overtake the bus moving ahead of the car. So the driver of the car accelerates at 1m/s^2 for 10 sec. Find the velocity of the car at the end of 10 sec. Also find the distance traveled by the car.
12. An object starts linear motion with a velocity 'u' and under uniform acceleration 'a' it acquires a velocity 'v' in time 't'. Draw its velocity time graph. From this graph obtain the following equations.
- a) position-time relation
- b) position-velocity relation

13. The driver of a car traveling along a straight road with a speed of 72km/h observes a signboard which gives the speed limit to be 54km/h. The signboard is

70m ahead when the driver applies the brakes. Calculate the acceleration of the car which will cause the car to pass the signboard at the stated speed limit?

14. Define acceleration. State a relationship connecting u , v , a and t for an accelerated motion. Give an example of a motion in which acceleration is uniform.

15. The velocity-time graph of an ascending passenger lift is as in the figure shown below.



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CHAPTER.10

GRAVITATION

1. A crumpled sheet of paper falls down faster than a plane sheet, why?
2. When we jump in to a swimming pool, we feel lighter. Why?
3. If two equal weights of unequal volumes are balanced in air, what will happen when these are completely dipped in water?
4. If the relative density of Aluminium is 2.7 and density of water is 1000 kgm^{-3} . What is the density of Aluminium in SI unit?
5. A woman walking on a wooden floor wearing high heels can damage the floor by making small dimples in the floor since her weight is concentrated on such a small area (the tip of the high heel). If the woman weighs 60N and the tip of the high heel is 1cm^2 , what will be the pressure exerted on the floor by her heels?
6. Calculate the weight of an astronaut of mass 80 kg on the surface of the earth and on the surface of the moon. Also calculate the ratio of mass of astronaut on the surface of the earth and on the surface of the moon. (Given that acceleration due to gravity on the surface of moon is one sixth of that on the earth)
7. The mass of a block made of certain material is 13.5 kg and its volume is $15 \times 10^{-3} \text{ m}^3$. Will the block float or sink in water. Give reason for your answer.
8. a) Give two differences between density and relative density.

b) Find relative density of Iron if density of Iron is 8500 kgm^{-3} and density of water is 1000 kgm^{-3} .

9. A stone slab of dimensions $60\text{cm} \times 40\text{cm} \times 20\text{cm}$ weighs 120 kg . It is placed on a table top. Calculate the pressure exerted by the stone slab on the table top if it is made to lie on the table top with its sides of dimensions:

(a) $60\text{cm} \times 40\text{cm}$ (b) $60\text{cm} \times 20\text{cm}$ (c) $40\text{cm} \times 20\text{cm}$

(Take $g = 10 \text{ ms}^{-2}$)

10. I have a book having dimensions $40\text{cm} \times 30\text{cm} \times 4\text{cm}$ and mass 500g . Find the pressure exerted by it on the table.

(i) When book lies down on the table.

(ii) When book is kept on the table such that it covers $30\text{cm} \times 4\text{cm}$ area of the table.

11. An imaginary planet has a mass 5 times and radius 3 times that of earth. What is the acceleration due to gravity on the planet, if the acceleration due to gravity on earth is 10 m/s^2 ?

12. If a stone is thrown vertically upwards to a height of 9.8m , calculate (i) the velocity with which it was thrown and (ii) time taken by it to reach the highest point. Take $g = 10\text{m/s}^2$

13. An object has a mass of 30 kg . What is its weight (i) on the moon (ii) on another planet? The value of 'g' on moon is $1/6$ the value of 'g' on the earth. The value of 'g' on the planet is 3 times the value of 'g' on the earth. Take ($g_e=10 \text{ m/s}^2$)

14. A body is thrown vertically upwards with an initial velocity of 100 m/s . Find :

(i) Time taken to reach maximum height

(ii) Maximum height reached

(iii) Velocity after 5 second (Take $g= 9.8 \text{ m/s}^2$).

15. (a) Distinguish between mass and weight of an object.

(b) How will the weight of a body of mass 100g change if it taken from equator to the poles? Give reason for your answer.

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