

PON VIDYASHRAM, VALASARAVAKKAM
PERIODIC TEST - 1
PHYSICS – WORK SHEET
CLASS – IX

MOTION

I. Very short answer questions:-

[1 mark]

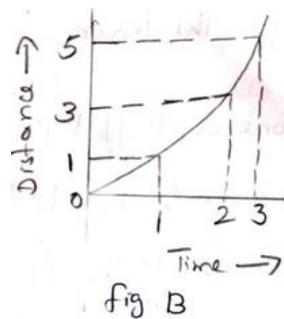
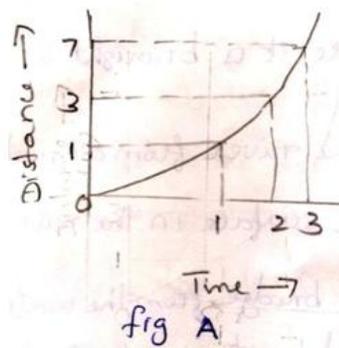
1. When is a body in a state of motion?
2. Can speed be negative – Give reason?
3. Give an example for uniformly accelerated motion.
4. What is the shape of a displacement – time graph for uniform velocity?
5. The velocity of an object is decreasing with passage of time. What conclusion do you draw about the acceleration of an object?
6. How can you find magnitude of velocity from a displacement time graph of an object?
7. Is it possible that the train in which you are sitting appears to move while it is at rest?
8. What is a reference point?
9. What does odometer of a vehicle measure?
10. Define acceleration of a body?
11. Define average velocity?
12. Define uniform speed.
13. Define non – uniform motion.
14. Define uniform motion.
15. Write the mathematical equation of acceleration.
16. Name the physical quantity measured by the area under velocity – time graph.
17. Give an example of motion in which the acceleration is against the direction of motion.
18. What do you mean by uniform circular motion.
19. Name the physical quantity which remain the same during uniform circular motion.
20. Name the physical quantity which changes during uniform circular motions.

II. Short Answer Questions:-

[2 mark]

1. Distinguish between scalar and vector quantity with example.
2. Differentiate between speed and velocity.
3. Distinguish between linear motion and circular motion.
4. What types of motion, an object has if its velocity – time graph is
 - (i) Parallel to the time axis
 - (ii) A straight line passing through the origin and having constant slope.
5. Name the physical quantity which can be obtained from velocity – time graph.
Explain.

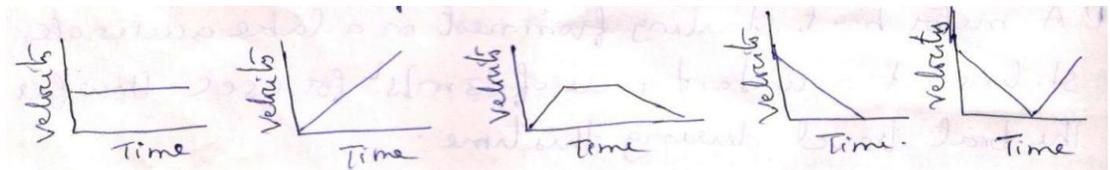
6.



Distance – time graph of a truck and bus are shows in Fig A and Fig B. what can you say about the motion of these vehicles and which of these vehicles is moving fast?

7. At a time when it is cloudy, there may be frequent thunder and lightning. The sound of thunder takes sometimes to reach an observer after he sees the lightning why does it happen?
8. A train starting from a railway station and moving with uniform acceleration attains a speed of 40 km / hr in 10 min. Find its acceleration?
9. A trolley while going down an inclined plane has an acceleration of 2 m / s^2 . What will be its velocity after 3 sec.?
10. A motor boat starting from rest on a lake accelerates in a straight line at a constant rate of 3 m / s^2 for 8 sec. How far does the boat travel during this time.

11. A train is travelling at a speed of 90 km/hr . Brakes are applied so as to produce a uniform acceleration of 0.5 m/s^2 . Find how far the train will go before it is brought to rest.
12. A stone is dropped freely in the river from a bridge. It takes 5 sec to touch the water surface in the river.
Calculate (i) the height of the bridge from the water level.
(ii) the distance covered by stone in the last second.
13. A body moving with uniform acceleration travels 24 m in the 6th sec and 44m in the 11th sec. Find (i) acceleration (ii) Initial Velocity
14. A body is dropped freely from the top of a tower, under gravity, of height 78.4 m. Calculate (a) time taken to reach the ground (b) Velocity with which it will strike the ground.
15. A girl bends to touch her toes. Is the motion of her head an example of uniform motion or accelerated motion? Explain your answer?
16. Suggest real life examples where the motion of a body is similar to that represented by the following velocity time graph.



17. An object starting from rest travels 20 m in the first 2 sec and 160 m in the next 4 sec. What will be the velocity after 7s from start?
18. An electron moving with a velocity of $5 \times 10^4 \text{ m/s}$ enters into a uniform electric field and acquires a uniform acceleration of 10^4 m/s^2 in the direction of its initial motion.
- (i) Calculate the time in which the electron would acquire a velocity double of its initial velocity.
- (ii) What distance would the electron cover in this time?

19. A train starting from rest pick up a speed 20 m/s in 200 sec. It continues to move at the same speed for the next 500 s. It is then brought to rest in the next 100sec.
- (i) Plot a speed time graph.
 - (ii) Calculate the rate of uniform retardation
 - (iii) Calculate the average speed during retardation.
20. Derive position – velocity relation with the help of a graph.

III. Long Answer Questions :-

[5 mark]

1. a. Define speed and write its S. I unit.
b. Derive the equation of motion $V = u + at$ using graphical method.
c. A train starting from rest attains a velocity of 72 km / hr in 5 minutes.
Assuming the acceleration is uniform. Find acceleration.
2. Draw Velocity – time graph for an uniformly accelerated object. Using $V - T$ graph derive $V^2 - u^2 = 2as$.
3. Which of the two decides the direction of motion of an object? Its velocity or the acceleration acting on it. Explain by giving an example.
4. A body starts from rest and moves along a straight line. It is uniformly accelerated at a rate of $2\text{m} / \text{s}^2$ for 10 s. For next 20 sec, the body moves with uniform velocity. Then negative acceleration of $2\text{m} / \text{s}^2$ acts on the body till the body comes to rest again. Draw $V - T$ graph for entire motion.
5. Abdul while driving to school, computes the average speed for his trip to be 20 Km / hr. On his return trip along the same route, there is less traffic and the average speed is 30 Km / hr. What is the average speed for his trip?
6. A driver of a car travelling at 52 Km / hr applies the brakes and decelerates uniformly in the opposite direction. The car stops in 5 s. Another driver going at 34 Km / hr in another car applies his brakes slowly and stops in 10 s. On the same graph paper plot the speed versus time for two cars. Which of the two car travelled farther after the brakes were applied.

7. (i) Using data draw time – displacement graph for a moving object.

Time (Sec)	Displacement (m)
0	0
2	2
4	4
6	4
8	4
10	6
12	14
14	2
16	0

- (ii) Use the same data calculate the average velocity for first 4 S, for next 4 S and for last 6 S.
8. State which of the following situation are possible and give an example for each of these.
- (a) An object with a constant acceleration but zero velocity.
- (b) An object moving in a certain direction with an acceleration in the perpendicular direction.
9. An object is dropped from rest at a height 150m and Simultaneously another object is dropped from rest at a height 100m. What is the difference in their height after 2 S if both the objects drop with same acceleration? How does the difference in heights vary with time?
10. Two stones are thrown vertically upward simultaneously with their initial velocities U_1 and U_2 respectively . Prove that the height reached by them would be in the ratio of $U_1^2 : U_2^2$ (Assume upward acceleration as $-g$)

FORCE AND LAWS OF MOTION

I. **Very short Answers:-**

[1 mark]

1. Define balanced force.
2. Define un balanced force.
3. A ball is moving over a horizontal smooth surface with a constant velocity. What type of forces are acting on the ball?

4. What do you mean by inertia?
5. Who has more inertia; a man or a child – Why?
6. Define resultant force.
7. State Newton's first law of motion.
8. On what factor does inertia of a body depends on?
9. What is momentum. Write its SI unit.
10. Define 1 Newton.
11. State Newton's 3rd law of motion.
12. Action and reaction are equal in magnitude, but not cancel each other. Explain.
13. State law of conservation of momentum.
14. How much force acts on a body whose momentum is constant?
15. What do you mean by recoil velocity of a gun?
16. State the law of conservation of momentum?
17. Why no force is required to move an object with constant velocity?
18. You are applying force on single pan of a weighing balance and the pointer points to 100 g. What is the force in Newton's applied by you?
19. Why does an electric fan continue to rotate for sometime even after the fan is switched off?
20. A light rubber ball and a cricket ball both are projected with equal velocities.
Whose momentum is more and why?

II. Short Answer Details:-

[2 – 3 mark]

1. State the various effects of force.
2. What happens to a person travelling in a bus when the bus takes a sharp turn?
3. Why does a person tend to fall forward when it stops suddenly?
4. A person in a bus tend to fall backward when it starts suddenly – Why?
5. It is easier to slip a tennis ball than a cricket ball moving with the same speed. Why?
6. Why are road accidents at high speed very much worse than accidents at low speed?
7. Give a simple experiment to illustrate the inertia of rest.
8. A fast medium bowler runs for quite some distance before delivering the ball –
Why?