

QUESTION BANK

CLASS IX

SUBJECT: PHYSICS

CH – 8 MOTION

1. Under what condition is the magnitude of average velocity equal to average speed? 1
2. What term is used to denote the change of velocity with time? Give its SI unit. 1
3. What can you say about the motion of a body if its displacement-time graph is a straight line? 1
4. A particle is moving in a circular path of radius r . What would be the displacement after half a circle? 1
5. What is the numerical ratio of displacement to distance for an object moving with uniform speed? 1
6. A car of mass 1000 kg is moving with a velocity of 10 m/s. If the velocity time graph for this car is a horizontal line parallel to the time axis, then what would be the velocity of the car at the end of 25 s? 1
7. State whether true or false: “Earth moves round the sun with uniform velocity.” Give reason to justify your answer. 2
8. A body with an initial velocity ‘ x ’ moves with a uniform acceleration ‘ y ’. Plot its velocity time graph. 2
9. A train starting from Railway Station attains a speed of 21m/s in one minute. Find its acceleration. 2
10. Differentiate between average speed and uniform speed. 2
11. Find the initial velocity of a car which is stopped in 10 seconds by applying brakes. The retardation due to brakes is 2.5 m/s^2 . 2
12. Draw a velocity – time graph to show the following motion:
A car accelerates uniformly from rest for 5 s, then it travels at a steady velocity for 5s. 2
13. A car travelling at 20 km/h speeds up to 60 km/h in 6 sec. What is its acceleration? 2
14. The tip of second’s hands of a clock takes 60 seconds to move once on the circular dial of the clock. If the radius of the dial of the clock be 10.5 cm, calculate the speed of the tip of the second’s hand of the clock. 2
15. A car is travelling at 20 m/s along the road. A child runs out into the road 50 m ahead and the car driver steps on the brakes pedal. What must be the car’s deceleration if the car is to stop just before it reaches the child? 2
16. A car is moving along a straight road at a steady speed. It travels 150 m in 5 seconds.
 - a. How far does it travel in 1 seconds?
 - b. How long does it take to travel 240m? 3
17. The distance between Delhi and Agra is 200 km. A train travels the first 100 km at a speed of 50 km/h. How fast must the train travel the next 100 km so as to average 70 km/h for the whole journey? 3
18. A train starting from rest moves with a uniform acceleration of 0.2 m/s^2 for 5 minutes. Calculate the speed acquired and the distance travelled in this time. 3

19. A car is moving on a straight road with uniform acceleration. The speed of the car varies with time as follows:

Time(s)	:	0	2	4	6	8	10
Speed(m/s)	:	4	8	12	16	20	24

Draw the speed- time graph by choosing a convenient scale. From this graph:

- Calculate the acceleration of the car.
- Calculate the distance travelled by the car in 10 seconds. 5

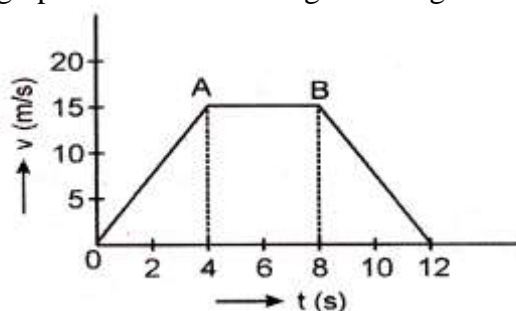
CH – 9 FORCE AND LAWS OF MOTION

- Q.1. Define inertia. Give its SI unit. 1
- Q.2. How are action-reaction forces related in magnitude and direction? 1
- Q.3. A ball is thrown vertically upwards. What is its momentum at the highest point? 1
- Q.4. It is necessary to run along with the moving bus in the same direction of the bus, while alighting from a bus. Give reason. 2
- Q.5. Why is it easier to stop a tennis ball than a cricket ball moving with same speed? 2
- Q.6. A book is kept on a table. Is there any force acting on it? Justify. 2
- Q.7. In collision between a heavier and a lighter body, which body experiences greater force? Justify. 2
- Q.8. Calculate the force required to impart to a car a velocity of 30m/s in 10 seconds starting from rest. The mass of the car is 1500kg. 2
- Q.9. The troops equipped to be dropped by parachutes from an aircraft are called paratroopers. Why do paratroopers roll on landing? 2
- Q.10. A 1000 kg vehicle moving with a speed of 20 m/s is brought to rest in a distance of 50 m.
- Find the acceleration.
 - Calculate the unbalanced force acting on the vehicle. 2
- Q.11. If a balloon filled with air and its mouth untied, is released with its mouth in the downward direction, it moved upwards. Why? 2
- Q.12. For how long should a force of 100N act on a body of 20kg so that it acquires a velocity of 100m/s? 2
- Q.13. Explain why, a cricket player moves his hands backwards while catching a fast cricket ball. 2
- Q.14. Which of the two, balanced or unbalanced forces, can change the shape of an object? Give an example too. 2
- Q.15. State Newton's second law of motion. Derive the expression for force acting on an object. 3
- Q.16. A gun of mass 3 kg fires a bullet of mass 30 g. the bullet takes 0.003 s to move through a barrel of the gun and acquires a velocity of 100 m/s. Calculate
- The velocity with which the gun recoils.
 - The force exerted on gunman due to recoil of the gun. 3

- Q.17. A force of 5N gives a mass m_1 an acceleration of 8m/s^2 , and a mass m_2 an acceleration of 24m/s^2 . What acceleration would it give if both the masses are tied together? 3
- Q.18. Explain the working of a rocket. 3
- Q.19. The velocity of a body of mass 10 kg increases from 4 m/s to 8 m/s when a force acts on it for 2 s.
- What is the momentum before and after the force acts?
 - What is the gain in momentum per second?
 - What is the value of force? 5

Q.20. (a) Define force.

(b) The velocity-time graph of a car of 1000 kg mass is given below.



- When is the maximum force acting on the car? Why?
- What is the retarding force?
- For how long is there no force acting? 5

CH – 10 GRAVITATION

- Q.1. Define free fall. 1
- Q.2. Which is more fundamental, the mass of a body or its weight? Why? 1
- Q.3. An object is thrown upwards with a velocity 'u'. What will be the greatest height 'h' to which it will rise before falling back ? 1
- Q.4. If a planet existed, whose mass and radius were both half of that of earth, what would be the acceleration due to gravity at the surface of the planet in terms of that on the surface of earth? 2
- Q.5. The force of gravitation between two cricket balls is extremely small but that between a cricket ball and the earth is extremely large. Give reason. 2
- Q.6. When a cricket ball is thrown vertically upwards , it reaches a maximum height of 5m. How much time is taken by the ball to reach the highest point? ($g=9.8\text{m/s}^2$) 2
- Q.7. "During a free fall, heavier objects accelerate more than lighter ones." State whether the given statement is true or false. Also, give reason to support your answer. 2
- Q.8. Differentiate between mass and weight. 2
- Q.9. If an object on equator is taken to poles, what will be the change in the mass and weight of the object? 2

- Q.10. What happens to the gravitational force between two objects when the distance between them is: (i) halved (ii) doubled? 2
- Q.11. If the distance between two masses is increased by a factor of 5, by what factor would the mass of one of them have to be altered to maintain the same gravitational force? 2
- Q.12. A force of 20N acts upon a body whose weight is 9.8N. What is the mass of the body and how much is the acceleration? 2
- Q.13. A coin and a piece of paper are dropped simultaneously from the same height. Which of the two will touch the ground first? What will happen if they are dropped in vacuum? Give reasons. 2
- Q.14. A body has a weight of 10 kg on the surface of earth. What will be its weight and mass when taken to the centre of the earth? 2
- Q.15. A stone is thrown vertically upwards. It reaches the maximum height in 3 seconds. Calculate the initial velocity of the stone. ($g=9.8\text{m/s}^2$) 2
- Q.16. Calculate the force of attraction between two objects of masses 10kg and 20kg kept at a distance of 100cm from each other. 2
- Q.17. The weight of a man on the surface of Earth is 588N. Find its mass. If the man were taken to the moon, his weight would be 98N. Calculate the value of g on moon. (g on earth= 9.8m/s^2) 3
- Q.18. Differentiate between 'g' and 'G'. 3
- Q.19. State universal law of gravitation. Write SI unit of G . The gravitational force between two objects is 100 N. How should the distance between the objects be changed so that force between them becomes 50 N? 3
- Q.20. The mass of moon is about 0.012 times that of earth and its diameter is about 0.25 times that of earth. Calculate the value of 'g' on moon as compared to earth. What will be the value of 'G'? 3