THE VILLAGE
INTERNATIONAL SCHOOL
"We Nurture Dreams"

PHYSICS QB

CH 1-MOTION

1. Fill in the blanks :-

Section A

(i) Velocity of a body is its _____in a particular direction.

(ii) In v – t graph, the area enclosed by the curve and the time – axis, gives the _____travelled by the body.

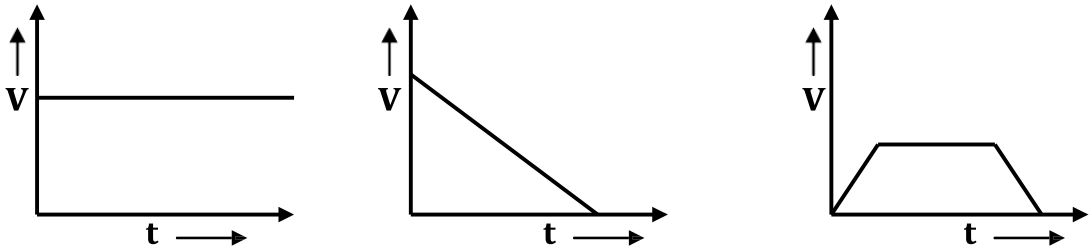
(iii) A rubber ball dropped from a certain height is an example of _____ speed.

(iv) 20m/s = _____km/hr.

(v) When a body is moving with uniform velocity, its acceleration is_____.

(vi) A ball moving down on inclined plane has uniform _____.

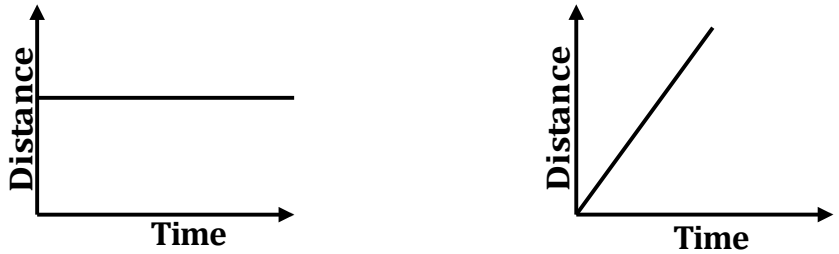
2. What type of motion is represented by the following graphs?



Q3. State which of the following quantities are scalars and which are vectors:-

a)	Velocity	*b)*	Speed	*c)*	Displacement
d)	Time	*e)*	Area	*f)*	Force

Q4. Interpret the following graphs



Section B

1. A body travels a distance of 5m from P to Q and then moves a distance of 10 m at right angle to PQ. Calculate the total distance travelled and the resultant displacement. Draw a diagram using appropriate scale.

2. Arrange the following in the increasing order of speed.

   (i) A bicycle moving with a speed of 18km/hr.
   (ii) A fast runner moving with a speed of 7m/s
   (iii) A car moving with a speed of 2000 m/min.

3. A body is moving in a circle of radius R. The body moves through half the circle. Calculate distance and displacement.

4. The distance between the house and the market is 7.2 km. If a man takes 10min to reach to market, calculate speed in m/s. Also express it in km/hr.

Section A

1. The area under speed – time graph is represented in units of

   (i) m (*ii)* m^2 (*iii)* m^3 (*iv)* m^{-1}

2. The v-t graph of a particle is not a straight line. Its acceleration is

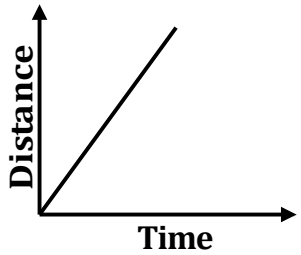
   (i) zero *(ii)* constant *(iii)* negative *(iv)* variable

3. If a particle moves with a constant speed, the distance-time graph is a

   (i) straight line sloping upward *(ii)* circle
   (iii) stair like line (*iv)* polygon

4. The distance – time graph of an object moving in fixed direction is shown below.

   The object
   (i) is at rest
   (ii) moves with a variable velocity
   (iii) moves with a constant acceleration
   (iv) moves with a constant speed



5. In circular motion the

   (i) direction of motion is fixed
   (ii) direction of motion changes continuously
   (iii) acceleration is zero
   (iv) velocity is constant

6. A car increases its speed from 15 km/h to 30km/hr. in 12 seconds. Its acceleration is

(i) 30 m/s^2 *(ii)* 0.3 m/s^2 *(iii)* 50 m/s^2 *(iv)* 18 m/s^2

7. The motion of the wheel of a cycle is

(i) rectilinear *(ii)* rotatory *(iii)* translatory
(iv) both rotatory and translatory.

8. Define the following terms:

(i) uniform speed *(ii)* uniform acceleration
(iii) retardation *(iv)* displacement

9. Which is greater?

(i) 60 km/hr. *(ii)* 15 m/s

10. Distinguish between uniformly and non-uniformly accelerated motion.

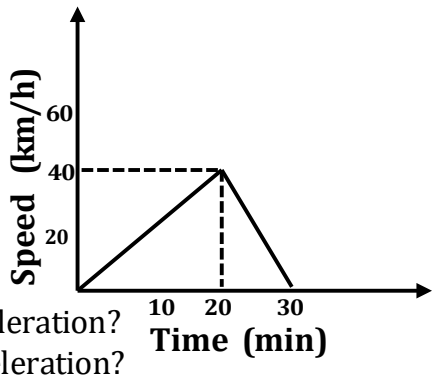
Section B

1. A bus takes 8 hours to cover a distance of 320 km. What is the average speed of the bus?

2. A car moves through 20 km with a speed of 40 km/h, and the next 20 km with a speed of 60 km/h. Calculate it average speed.

3. The driver of a car travelling at 36 km/h applies the brakes to decelerate uniformly. The car stops in 10 s. Plot the speed – time graph for this period. Find the distance travelled by the car during this period by calculating area under the graph.

4. Speed – Time graph of a bus is shown below.



(i) In which period is the bus accelerating?
(ii) In which period is the bus decelerating?
(iii) What is the distance covered during its acceleration?
(iv) What is the distance covered during its deceleration?
(v) What is the average speed during the entire journey?

5. A ship moves at a speed of 56 km/h. One second later, is moving at 58 km/h. What is the acceleration in m/s^2?

6. Choose the wrong statement (s)

   (i) Acceleration due to gravity is a vector quantity.
   (ii) Displacement is a scalar quantity.
   (iii) Retardation is a vector quantity.
   (iv) Average speed is a vector quantity.

7. A train is moving at a speed of 90km/h. On applying brakes, a retardation of $2.5m/s^2$ is created. At what distance before, should the driver apply the brakes to stop the train at the station?

8. The initial velocity of a car is 15m/s. It moves with an acceleration of $2m/s^2$. What will be its speed after 25 sec?

9. A train 100m long moving on a straight level track passes a pole in 5 seconds. Find

   (i) The speed of the train
   (ii) The time it will take to cross a bridge 500m long

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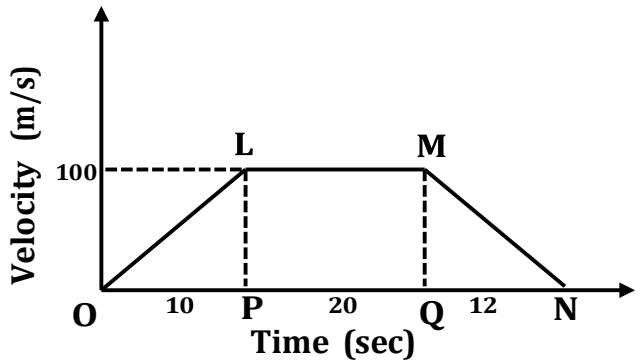
Section A

1. The area under the velocity-time graph represents

   a) Displacement *b)* Velocity
   c) Change in velocity *d)* Distance

2. 

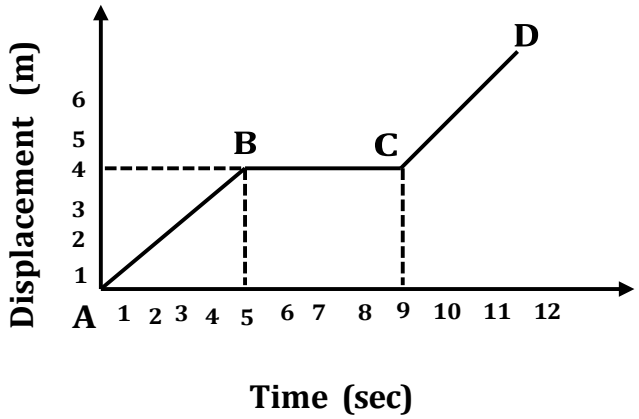
   The graph shows velocity of a moving bus during different time intervals. Calculate

   a) total distance covered by the bus from 0to N, time interval between P to Q being 20 sec.
   b) the uniform acceleration and retardation of the bus.

3. A particle with a velocity of 2m/s at t=0 moves with a constant acceleration of 0.2 m/s^2. The distance covered by the particle in 10s is

a) 20 m *b)* 10 m *c)* 30 m *d)* 40 m

4.



a) In which case is the speed constant?
b) In which is the speed decreasing?
c) In which case is the speed increasing?
d) What happens in the third case?

5. A quantity is measured to be -30m/s. Is it speed or velocity? Give reason for your answer.

Section B

1. Derive $s = u\,t + 1/2\,at^2$ graphically, where symbols have their usual meaning.

2. A bullet hits a wall with a velocity of 20m/s and penetrates it up to a distance of 5 cm. Find the deceleration of the bullet in the wall.

H.O.T.S. Questions

Q.1 Calculate the speed of the tip of the second's hand of the watch of length 1.5cm.

Q.2 Two bodies are moving with constant speed *v* such that they are always at a constant distance *d* apart and their velocities are always equal in opposite. After what time they will return to their initial positions?