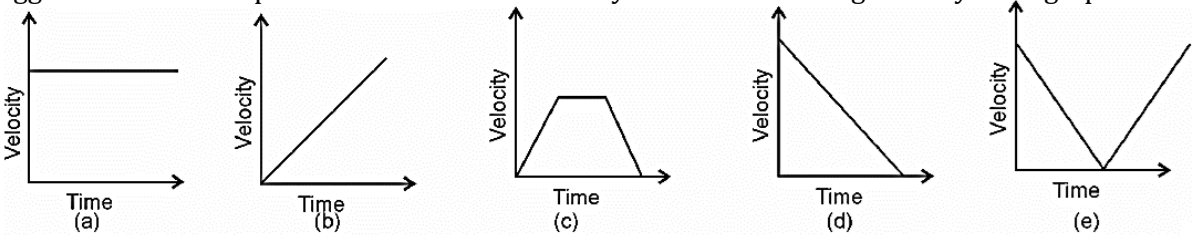
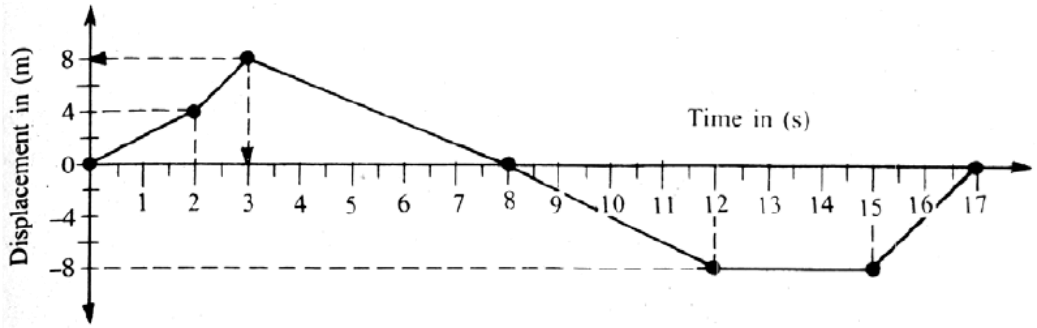
Board – ICSE	Class – 9th	Topic – Motion in one Dimension

1. (a) Define the term acceleration.
   (b) When is acceleration (i) Positive? (ii) Negative?
   (c) State the unit of acceleration in C.G.S. and S.I. systems.
2. What is the relation between distance and time, when :
   (i) Body is moving with a uniform velocity?
   (ii) Body is moving with variable velocity?
3. What do you understand by the terms (i) rest (ii) motion? Support your answer by giving two examples each.
4. The Shatabadi Express covers a distance of 450 km in 5 hrs between Amritsar and Delhi. What is average speed of train in (i) km hrs^{-1} (ii) ms^{-1}
5. A race horse runs straight towards north and covers 540 m in one minute. Calculate
   (i) displacement of horse (ii) velocity in (a) ms^{-1} (b) $kmhr^{-1}$.
6. Draw displacement-time graphs in the following situations:
   (i) When the body is stationary.
   (ii) When the body is moving with a uniform velocity.
   (iii) When the body is moving with variable velocity.
7. How can you calculate the following?
   (i) Velocity from displacement-time graph.
   (ii) Acceleration from velocity-time graph.
   (iii) Displacement from velocity-time graph.
   (iv) Velocity from acceleration-time graph.
8. Suggest real life examples about the motion of body from the following velocity-time graphs:



9. Draw a diagram to show the motion of a body whose speed remains constant, but velocity changes continuously.

10. From the displacement–time graph shown below calculate:
    (i) Average velocity in first three seconds.
    (ii) Displacement from initial position at the end of 13 s.
    (iii) Time after which body is at initial position.
    (iv) Average velocity after 8 s.



11. A truck running at 90 km hr^{-1} is brought to rest over a distance of 25 m. Calculate the retardation and time for which brakes are applied.
12. A stone thrown vertically upward, takes 3 s to attain maximum height. Calculate
    (i) Initial velocity of stone
    (ii) Maximum height attained by the stone. [Take g = 9.8 ms^{-2}]
13. A train starting from rest, picks up a speed of 20 ms^{-1} in 200 s. It continues to move at the same rate for the next 500 s and then brought to rest in another 100 s.
    (i) Plot a speed-time graph.
    (ii) From the graph calculate:
        (a) Uniform rate of acceleration
        (b) Uniform rate of retardation
        (c) Total distance covered before stopping
        (d) Average speed.
14. A spaceship is moving in space with a velocity of 60 kms^{-1}. It fires its retro-engines for 20 s and the velocity is reduced to 55 kms^{-1}. Calculate the distance travelled by spaceship in 40 s, from the time of firing retro-engines.

15. The table above shows the velocity of a motor bike at various intervals of time.

(i) Plot the velocity-time graph.

(ii) Calculate de-acceleration between 5 s – 7 s.

(iii) Calculate acceleration between 7 s and 10 s.

(iv) Calculate de-acceleration between 10 s and 15 s.

(v) Total distance travelled by motor-bike.

(vi) Average velocity of motor bike.

Velocity in (ms^{-1})	20	20	10	20	0
Time in (seconds)	0	5	7	10	15