# Shiksha Classes Bhandara
# CHAPTER TEST

**Subject : Physics** **Topic : Motion in One Dimension** **M.M. : 100**

**Marking Scheme:**

(i) Each question is allotted 4 (four) marks for each correct response.

(ii) ¼ (one fourth) marks will be deducted for indicating incorrect response of each question. No deduction from the total score will be made if no response is indicated for an item in the answer sheet.

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**Q.1** A particle is moving in a straight line along x-axis, its position is given by $x = 2t^2 + 2t + 4$ where x is in metre and t in sec, the acceleration of the particle is –

(A) 2 m/s$^2$ (B) 4 m/s$^2$

(C) 6 m/s$^2$ (D) 8 m/s$^2$

**Q.2** If the first one-third of a journey is travelled at 20 km/hr, next one-third at 40 km/h and the last one-third at 60 km/h. The average speed of whole journey will be –

(A) 32.7 km/h (B) 35 km/h

(C) 40 km/h (D) 45 km/h

**Q.3** A ball is thrown upwards, it takes 4s to reach back to the ground. Find its initial velocity –

(A) 30 m/s (B) 10 m/s

(C) 40 m/s (D) 20 m/s

**Q.4** If relation between distance and time is $s = a + bt + ct^2$, find initial velocity and acceleration –

(A) b + 2ct, 2c (B) b, 2c

(C) 2c, b (D) b + 2c, 2c

**Q.5** A police jeep is chasing with velocity of 45 km/h, a thief in another jeep moving with velocity 153 km/h. Police fires a bullet with muzzle velocity of 180 m/s. The velocity with which it will strike the jeep of the thief, is –

(A) 150 m/s (B) 27 m/s

(C) 450 m/s (D) 250 m/s

**Q.6** A body falls from a height h = 200m. The ratio of distance travelled in each 2s, during t = 0 to t = 6s of the journey is–

(A) 1 : 4 : 9 (B) 1 : 2 : 4

(C) 1 : 3 : 5 (D) 1 : 2 : 3

**Q.7** A point initially at rest moves along x-axis. Its acceleration varies with time as $a = (6t + 5)$ m/s$^2$. If it starts from origin, the distance covered in 2s is –

(A) 20m (B) 18m

(C) 16m (D) 25m

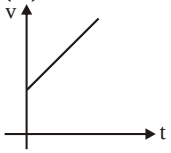
**Q.8** If acceleration of a particle at any time is given by $a = 2t + 5$, calculate the velocity after 5s, if it starts from rest

(A) 50 m/s (B) 25 m/s

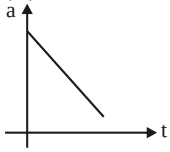
(C) 100 m/s (D) 75 m/s

**Q.9** A body moves with uniform acceleration, then which of the following graphs is correct –

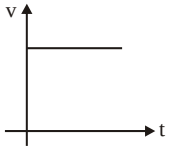
(A)



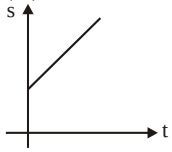

(B)




(C)




(D)




**Q.10** The displacement of a particle is represented by the following equation $s = 3t^3 + 7t^2 + 5t + 8$ where s is in metre and t in second. The acceleration of the particle at t = 1s is –

(A) 14 m/s$^2$ (B) 18 m/s$^2$

(C) 32 m/s$^2$ (D) zero

**Q.11** A particle is moving in east direction with speed 5 m/s after 10 sec it starts moving in north direction with same speed. Find average acceleration.

(A) 2 m/s$^2$ (B) $\frac{1}{\sqrt{2}}$ m/s$^2$

(C) 1 m/s$^2$ (D) zero

**Q.12** If a ball is thrown vertically upwards with speed u, the distance covered during the last t seconds of its ascent is

(A) (u + gt) t (B) ut

(C) $\frac{1}{2}gt^2$ (D) ut – $\frac{1}{2}gt^2$

**Q.13** A man throws balls with the same speed vertically upwards one after the other at an interval of 2seconds. What should be the speed of the throw so that more than two balls are in the sky at any time- [Given g = 9.8 m/s$^2$]

(A) Only with speed 19.6 m/s

(B) More than 19.6 m/s

(C) At least 9.8 m/s

(D) Any speed less than 19.6 m/s

**Q.14** The displacement x of a particle varies with time t as $x = ae^{-\alpha t} + be^{\beta t}$, where a, b, $\alpha$ and $\beta$ are positive constants. The velocity of the particle will –

(A) be independent of $\alpha$ and $\beta$

(B) drop to zero when $\alpha = \beta$

(C) go on decreasing with time

(D) go on increasing with time

**Q.15** A particle moves along a straight line OX. At a time t (in seconds) the distance x (in metres) of the particle from O is given by $x = 40 + 12t - t^3$. How long would the particle travel before coming to rest –

(A) 40m (B) 56m

(C) 16m (D) 24m

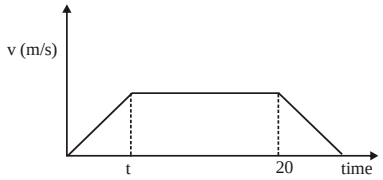
**Q.16** A car moves from X to Y with a uniform speed $v_u$ and returns to Y with a uniform speed $v_d$. The average speed for this round trip is –

(A) $\sqrt{v_u v_d}$ (B) $\frac{v_d v_u}{v_d + v_u}$

(C) $\frac{v_u + v_d}{2}$ (D) $\frac{2v_d v_u}{v_d + v_u}$

**For Q.17-Q.19**

The velocity-time graph of a particle moving along a straight line is as shown in figure. The rate of acceleration and retardation is constant and is equal to 5 $m/s^2$. If the average velocity during the motion is 20m/s, then –




**Q.17** The value of t is –

(A) 5s (B) 10s

(C) 20s (D) $5\sqrt{2}$s

**Q.18** The maximum velocity of the particle is –

(A) 20m/s (B) 25m/s

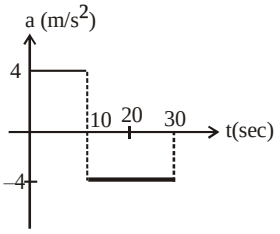
(C) 30m/s (D) 40m/s

**Q.19** The distance travelled with uniform velocity is –

(A) 375m (B) 125m

(C) 300m (D) 450m

**Q.20** The acceleration versus time graph for a particle moving along a straight line is shown in the figure. If the particle starts from rest at t = 0, then its speed at t = 30 sec. will be–




(A) 20m/sec (B) 0 m/sec

(C) – 40 m/sec. (D) 40 m/sec.

**For Q.21-Q.25 :**

**The answer to each question is a NUMERICAL VALUE.**

**Q.21** A boat crosses a river with a velocity of 8 km/h. If the resulting of boat is 10 km/h, then the velocity (in km/h) of river water is –

**Q.22** A stone is thrown vertically upward. When particle is at a height half of its maximum height its speed is 10 m/s, then the maximum height (in metre) attained by the particle is – [g = 10 $m/s^2$]

**Q.23** A particle starts from rest with constant acceleration =2$m/s^2$. Find displacement (in m) in $5^{th}$ sec.

**Q.24** The position x of a particle with respect to time t along x-axis is given by $x = 9t^2 - t^3$ where x is in metres and t in second. What will be the position of this particle when it achieves maximum speed along the +ve x direction ?

**Q.25** Two bodies, A (of mass 1 kg) and B (of mass 3 kg), are dropped from heights of 16m and 25m, respectively. The ratio of the time taken by them to reach the ground is X : 5. Find the value of X.