KINEMATICS

1. A car travels from the place A to B with a speed v_1. During its return journey from B to A its speed is v_2. Then the average speed in complete journey is _____.

(A) $\frac{2v_1v_2}{v_1+v_2}$ (B) $\frac{v_1+v_2}{2}$ (C) $\frac{2(v_1+v_2)}{v_1v_2}$ (D) $\sqrt{\frac{v_1+v_2}{2}}$

2. If a car covers first 2/5th of its total distance with a speed v_1 and the remaining 3/5th of the total distance with a speed v_2, then its average speed is _____.

(A) $\frac{1}{2}\sqrt{v_1v_2}$ (B) $\frac{5v_1v_2}{2v_1+3v_2}$ (C) $\frac{2v_1v_2}{v_1+v_2}$ (D) $\frac{5v_1v_2}{3v_1+2v_2}$

3. A train runs past a telegraph pole 15 sec and through a tunnel of length 450 m in 45 sec. The length of the train is _____.

(A) 225 m (B) 325 m (C) 425 m (D) 290 m

4. If the velocity 'u' of a body moving along a straight line with a constant retardation 'a' is reduced by 75% in time 't' then 't' = _____.

(A) $\frac{u}{4a}$ (B) $\frac{3u}{4a}$ (C) $\frac{4u}{3a}$ (D) $\frac{u}{3a}$

5. If a bus accelerates from rests for time t_1, at a constant rate 'α' and then retards at a constant rate β for time t_2 and comes to rest then $\frac{t_1}{t_2} =$

(A) $\frac{\alpha}{\beta+\alpha}$ (B) $\frac{\beta+\alpha}{2}$ (C) $\frac{\beta+\alpha}{\alpha}$ (D) $\frac{\beta}{\alpha}$

6. Given that $s = 5t + 8t^2$ in SI units. Then the initial velocity and acceleration are _____.

(A) $5ms^{-1}, 8ms^{-2}$ (B) $5ms^{-1}, 4ms^{-2}$ (C) $10ms^{-1}, 16ms^{-2}$ (D) $5ms^{-1}, 16ms^{-2}$

7. A particle starts with an initial velocity 'u' and retardation 'a'. It reaches the initial position in a time of _____.

(A) $\frac{u}{a}$ (B) $\frac{u}{a^2}$ (C) $\frac{u^2}{a}$ (D) $\frac{2u}{a}$

8. A bus starts from rest and moves with an acceleration of $1ms^{-2}$. A man is 48 m behind the bus and runs to catch it with a constant velocity of $10ms^{-1}$. The time taken by him to catch the bus is _____.

(A) 12 sec (B) 8 sec (C) 16 sec (D) 10 sec

9. A particle is moving with constant acceleration. Its velocity is reduced to zero in 5 sec and it covered a distance of 100 m in this direction. The distance covered by the particle in the next 5 sec is

(A) zero (B) 250 m (C) 100 m (D) 500 m

10. A bus starts from rest moves with a uniform acceleration 'a', simultaneously a passenger at a distance 'x' from the bus starts running to catch the bus. The minimum velocity of the passenger to catch the bus is _____.

(A) $\sqrt{2ax}$ (B) 2ax (C) ax (D) $\sqrt{ax}$

11. A body starts from rest with a uniform acceleration of $8 ms^{-2}$. The time in seconds, taken by it to traverse the second metre of the journey is _____

(A) $\sqrt{2}-1$ sec (B) $\frac{\sqrt{2}-1}{2}$ sec (C) $\frac{1}{\sqrt{2}}$ sec (D) $\frac{1}{\sqrt{2}-1}$ sec

12. A bullet moving with a velocity of $10 ms^{-1}$ is brought to rest after penetrating a wooden plank of 4 cm thickness. The retardation of the bullet is _____.

(A) $-1200 ms^{-2}$ (B) $-1250 ms^{-2}$ (C) $1200 ms^{-2}$ (D) $1250 ms^{-2}$

13. The speed of a body is doubled when it moves over a distance of 10 m. If the initial speed is 'u' then the speed after further covering a distance of 10 m is _____.

(A) $\sqrt{5}u$ (B) $\sqrt{6}u$ (C) $\sqrt{7}u$ (D) $\sqrt{8}u$

14. If the velocity of a car is increased by 20%, then the minimum distance in which it can be stopped increased by

(A) 44% (B) 55% (C) 66% (D) 88%

15. A car moving with a speed of 50 kmph can be stopped by applying breaks after travelling atleast a distance of 6m. If the same car is moving at a speed of 100 kmph, the minimum distance covered by the car before being stopped is _____.

(A) 26 m (B) 24 m (C) 20 m (D) 27 m

16. A bullet loses 1/20 of its velocity on passing through a plank. The least number of planks required to stop the bullet is _____

(A) 10 (B) 11 (C) 12 (D) 13

17. If a particle having an initial velocity of $20 ms^{-1}$, move with a uniform acceleration of $10 ms^{-2}$. Then the distance covered by it when it attains a final velocity of $80 ms^{-1}$ is _____

(A) 200 m (B) 150 m (C) 300 m (D) 250 m

18. A jeep travelling with a velocity of 108 kmph is brought to rest by applying breaks. If experiences a uniform retardation of $3 ms^{-2}$ before coming to rest. It travels a distance of _____.

(A) 200 m (B) 260 m (C) 100 m (D) 150 m

19. It was once recorded that a car left skid marks which were 300 m in length. Assuming that the car skidded to a stop with a constant acceleration of $-4 ms^{-2}$. The speed of car before it began to skid is _____.

(A) $40\sqrt{6} ms^{-1}$ (B) $40\sqrt{5} ms^{-1}$ (C) $20\sqrt{6} ms^{-1}$ (D) $30\sqrt{5} ms^{-1}$

20. A particle starting from rest reaches a maximum velocity 'v' with a uniform acceleration and comes to rest with a uniform deceleration by covering a total distance 's' moving along a straight line. The total time of motion is _____.

(A) $\frac{s}{v}$ (B) $\frac{2s}{v}$ (C) $\frac{2s}{3v}$ (D) $\frac{s}{2v}$

KEY

1.	A	**2.**	D	**3.**	A	**4.**	B	**5.**	D
6.	D	**7.**	D	**8.**	A	**9.**	C	**10.**	A
11.	B	**12.**	D	**13.**	C	**14.**	A	**15.**	B
16.	A	**17.**	C	**18.**	D	**19.**	C	**20.**	B

✻ *Wish You all the Best* ✻