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Assignment
Subject: Physics
Batch: Endeavour Advanced
Topic: Kinametics

1. If a ball is thrown vertically upward with speed u, the distance covered during the last t seconds of its ascent is :
   (a) $ut - \frac{1}{2}gt^2$ (b) $\frac{1}{2}gt^2$ (c) (u + gt) t (d) ut
2. How long will it take to stop a car travelling at a speed of 20 m/sec, if the uniform acc. During braking is – 5 m/s^2 ?
   (a) 100 s (b) 4 s (c) (1/4) s (d) (1/100) s
3. A particle starts moving from the position of rest under a constant acc. It travels a distance x in the first 10 sec and distance y in the next 10 sec, then:
   (a) y = x (b) y = 2x (c) y = 3x (d) y = 4x
4. A ball is released from the top of height h metre. It takes T second to reach the ground. Where is the ball at the time T / 2 sec?
   (a) At (h / 4) m from the ground
   (b) At (h / 2) m from the ground
   (c) At (3h / 4) m from the ground
   (d) Depends upon the mass and volume of the ball
5. A pebble is thrown vertically upwards from a bridge with an initial velocity of 4.9 m/s. It strikes the water after 2s. The height of the bridge is :
   (a) 19.6 m (b) 14.7 m (c) 9.8 m (d) 4.9 m
6. A ball is thrown vertically upwards with a speed of 10 m/s from the top of a tower 200 m high and another is thrown vertically downwards with the same speed simultaneously.
   The time difference between them in reaching the ground in s (g = 10 m/s^2) is :
   (a) 12 (b) 6 (c) 2 (d) 1
7. A particle moving with constant acceleration, travels 10 m in the first 5 second and another 10 m in the next 3 second. The distance, it will travel in the next 2 second will be :
   (a) 8.33 m (b) 5.67 m (c) 9.37 m (d) 10 m
8. The speed of a car was 50 km/hr for the first 900 s, then 400 km/hr for the next 50 km and then the car decelerated uniformly at 10 km/hr^2 till it came to rest. The average speed of the car was :
   (a) 50 km/hr (b) 7.2 m/s (c) 30 km/hr (d) 9.0 m/s
9. A particle moving with a uniform acceleration along a straight line covers distances a and b in successive intervals of p and q second. The acceleration of the particle is :
   (a) $\frac{pq(p+q)}{2(bp-aq)}$ (b) $\frac{2(aq-bp)}{pq(p-q)}$ (c) $\frac{pq-aq}{pq(p-q)}$ (d) $\frac{2(bq-aq)}{pq(p+q)}$
10. A small block slides, without friction, down an inclined plane starting from rest. Let S_n be the distance travelled from t = (n – 1) seconds to t (= n) seconds. Then S_n / S_{n+} is:
    (a) $\frac{2n-1}{2n}$ (b) $\frac{2n+1}{2n-1}$ (c) $\frac{2n-1}{2n+1}$ (d) $\frac{2n}{2n+1}$

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11. A car accelerates from rest at a constant rate α for some time after which it decelerates at a constant rate β to come to rest. If the total time elapsed is t, maximum velocity reached by the car is :

(a) $\frac{\alpha\beta(\alpha+\beta)}{t}$ (b) $\frac{\alpha\beta}{(\alpha-\beta)}t$ (c) $\frac{\alpha\beta}{\alpha+\beta}t$ (d) $\frac{\alpha+\beta}{\alpha\beta}t$

12. In Q. 11 time for which the car decelerates is :

(a) $\frac{\alpha}{\alpha+\beta}t$ (b) $\frac{\beta}{\alpha+\beta}t$ (c) $\frac{\alpha}{\beta}t$ (d) $\frac{\beta}{\alpha}t$

13. A packet is dropped from a balloon that is moving upward when the balloon is at a height 60 m above ground. If the speed of the balloon at the moment of release of packet is 5 m / s, time taken by the packet to reach ground will be : (Take g = 10 m / s^2)

(a) 6 sec (b) 4 sec (c) 2 sec (d) 3.2 sec

14. An object is dropped from the top of a tower. It travels a distance 'x' in the first second of its motion and a distance '7x' in the last second. Height of the tower is: (Take g = 10 m /s^2)

(a) 60 m (b) 70 m (c) 80 m (d) 90 m

15. A bus starts from rest and accelerates at a uniform rate 4 m / s^2 for certain time. It then moves with a constant speed for some time and finally retards at 4 m / s^2 to come to rest. Average speed of the bus during the total journey is 15 m/s and the total time is 20 sec. Time duration for which the car moves with constant speed is:

(a) 18 sec (b) 16 sec (c) 12 sec (d) 10 sec

16. A body is thrown vertically upward at t = 0. It is at a height 80 m at instants t_1 and t_2. Also, it is at a height 60 m at instants t_1' and t_2', Then :

(a) $t_1 + t_2 = t_1' + t_2'$ (b) $t_1 + t_2 > t_1' + t_2'$ (c) $t_1 + t_2 < t_1' + t_2'$ (d) none of these

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