

## Yakeen NEET 2.0 2026

## Physics by MR Sir

DPP: 4

## Motion in a Plane

**Q1** A car starts from rest and accelerates at  $4 \text{ m/s}^2$  for 5 seconds. The car then decelerates at  $2 \text{ m/s}^2$  for the next 4 seconds. What is the total distance traveled by the car?

- (A) 50 (B) 100  
(C) 150 (D) 200

**Q2** A particle moves in a straight line under a variable acceleration  $a(t) = -3t^2 + 4$ . What is the velocity of the particle at  $t = 3$  seconds if the initial velocity is  $10 \text{ m/s}$ ?

- (A)  $-5 \text{ m/s}$  (B)  $10 \text{ m/s}$   
(C)  $15 \text{ m/s}$  (D)  $20 \text{ m/s}$

**Q3 Assertion :** A packet is dropped from rising balloon. The initial velocity of packet is zero.

**Reason :** Initial velocity of a dropping packet is equal to the velocity of the body from which it is dropped.

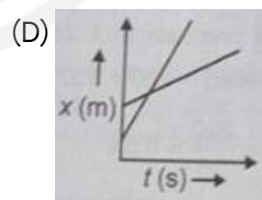
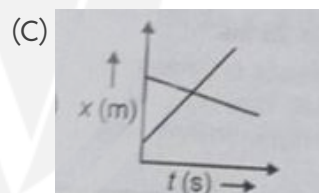
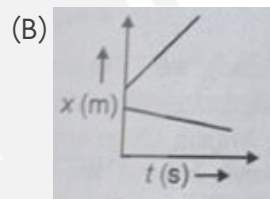
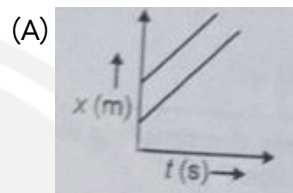
- (A) Both (A) and (R) are true, and (R) is the correct explanation of (A).  
(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).  
(C) Assertion (A) is true but (R) is false.  
(D) Assertion (A) is false but (R) is true.

**Q4** A body  $A$  is going from South to North and body  $B$  is going from West to East with identical velocity. Then direction of relative velocity of  $A$  with respect to  $B$  is:

- (A) North-West (B) South-West

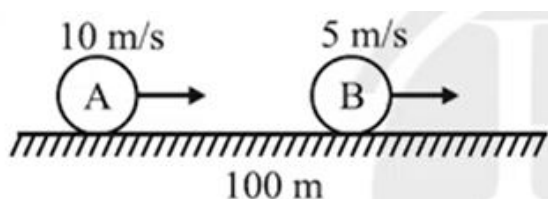
- (C) North-East (D) South-East

**Q5** Which of the following position-time graphs correctly represents two moving objects A and B with zero relative velocity?



**Q6** An object A is moving with  $10 \text{ m/s}$  and B is moving with  $5 \text{ m/s}$  in the same direction of positive  $x$ -axis. A is  $100 \text{ m}$  behind B as shown. Find time taken by A to meet B.





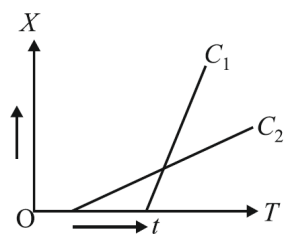
- (A) 18sec  
(B) 16sec  
(C) 20sec  
(D) 17sec
- Q7** A ball A is dropped from a building of height 45 m. Simultaneously another identical ball B is thrown up with a speed  $50 \text{ ms}^{-1}$ . The relative speed of ball B w.r.t. ball A at any instant of time till both balls are in air is (Take  $g = 10 \text{ ms}^{-2}$ )  
(A)  $0 \text{ ms}^{-1}$  (B)  $10 \text{ ms}^{-1}$   
(C)  $25 \text{ ms}^{-1}$  (D)  $50 \text{ ms}^{-1}$
- Q8** Preeti reached the metro station and found that the escalator was not working. She walked up the stationary escalator in time  $t_1$ . On other days, if she remains stationary on the moving escalator, then the escalator takes her up in time  $t_2$ . The time taken by her to walk up on the moving escalator will be:  
(A)  $\frac{t_1+t_2}{2}$   
(B)  $\frac{t_1 t_2}{t_2 - t_1}$   
(C)  $\frac{t_1 t_2}{t_2 + t_1}$   
(D)  $t_1 - t_2$
- Q9** A person sitting in an open car moving at constant velocity throws a ball vertically up into air. The ball falls:  
(A) Outside the car  
(B) In the car ahead of the person  
(C) In the car to the side of the person  
(D) Exactly in the hand which threw it up
- Q10** Two cars are moving in the same direction with a speed of  $30 \text{ km/h}$ . They are separated from each other by  $5 \text{ km}$ . Third car moving in the opposite

direction meets the two cars after an interval of 4 minutes. The speed of the third car is

- (A)  $30 \text{ km/h}$  (B)  $25 \text{ km/h}$   
(C)  $40 \text{ km/h}$  (D)  $45 \text{ km/h}$

- Q11** Two cars A and B are moving in same direction with velocities  $30 \text{ m/s}$  and  $20 \text{ m/s}$  respectively. When car A is at a distance  $d$  behind the car B, the driver of the car A applies brakes producing uniform retardation of  $2 \text{ m/s}^2$ . There will be no collision when  
(A)  $d < 2.5 \text{ m}$   
(B)  $d > 125 \text{ m}$   
(C)  $d > 25 \text{ m}$   
(D)  $d < 125 \text{ m}$
- Q12** Two trains each of length  $100 \text{ m}$  moving parallel towards each other at speed  $72 \text{ km/h}$  and  $36 \text{ km/h}$  respectively. In how much time will they cross each other?  
(A)  $4.5 \text{ s}$   
(B)  $6.67 \text{ s}$   
(C)  $3.5 \text{ s}$   
(D)  $7.25 \text{ s}$
- Q13** A ball is dropped from the top of a building of height  $80 \text{ m}$ . At same instant another ball is thrown upwards with speed  $50 \text{ m/s}$  from the bottom of the building. The time at which balls will meet is  
(A)  $1.6 \text{ s}$  (B)  $5 \text{ s}$   
(C)  $8 \text{ s}$  (D)  $10 \text{ s}$
- Q14** Shown in the figure are the displacement time graph for two children going home from the school. Which of the following statements about their relative motion is true after both of them started moving?





Their relative velocity:

- (A) First increases and then decreases
- (B) First decreases and then increases
- (C) Is zero

(D) Is non zero constant

**Q15** Two cars A and B are at rest at same point initially. If A starts with uniform velocity of 40 m/sec and B starts in the same direction with constant acceleration of  $4 \text{ m/s}^2$ , then B will catch A after how much time?

- (A) 10 sec
- (B) 20 sec
- (C) 30 sec
- (D) 35 sec



## Answer Key

Q1 (C)

Q2 (A)

Q3 (D)

Q4 (A)

Q5 (A)

Q6 (C)

Q7 (D)

Q8 (C)

Q9 (D)

Q10 (D)

Q11 (C)

Q12 (B)

Q13 (A)

Q14 (D)

Q15 (B)



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