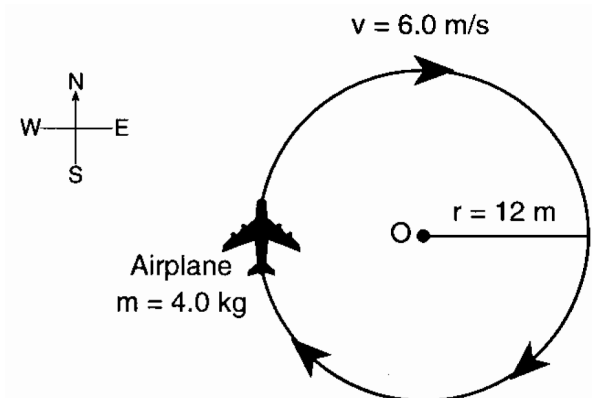


## PASSAGE - 1

Read the following write - up and answer for the question 1, 2, 3 given below-

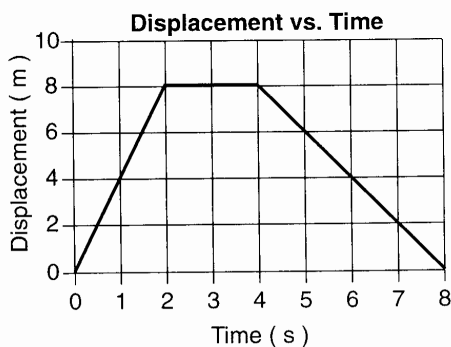
A 4.0 kilogram model airplane travels in a horizontal circular path of radius 12 meters at a constant speed of 6.0 meters per second.



- Q.1** At the position shown, what is the direction of the net force acting on the airplane ?  
 (A) North (B) East (C) South (D) West
- Q.2** What is the magnitude of the centripetal acceleration of the airplane ?  
 (A)  $0.50 \text{ m/s}^2$  (B)  $3.0 \text{ m/s}^2$  (C)  $2.0 \text{ m/s}^2$  (D)  $12 \text{ m/s}^2$
- Q.3** If the speed of the airplane is doubled and the radius of the path remains unchanged, the magnitude of the centripetal force acting on the airplane will be-  
 (A) Half as much (B) One-fourth as much (C) Twice as much (D) Four times as much

## PASSAGE - 2

Base your answers to questions 4 and 5 on the graph below, which represents the relationship between the displacement of an object and its time of travel along a straight line.

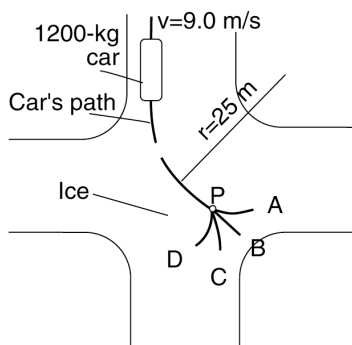


- Q.4** What is the magnitude of the object's total displacement after 8.0 seconds ?  
 (A) 0 m (B) 2 m (C) 8 m (D) 16 m
- Q.5** What is the average speed of the object during the first 4.0 seconds ?  
 (A) 0 m/s (B) 2 m/s (C) 8 m/s (D) 4 m/s

**PASSAGE - 3**

Base your answers to questions 6 and 7 on the information and diagram below.

A 1200-kilogram car traveling at a constant speed of 9.0 meters per second turns at an intersection. The car follows a horizontal circular path with a radius of 25 meters to point P.

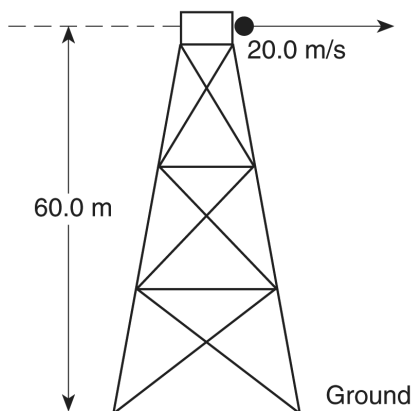


- Q.6** The magnitude of the centripetal force acting on the car as it travels around the circular path is approximately  
 (A)  $1.1 \times 10^4$  N                      (B)  $1.2 \times 10^4$  N                      (C)  $3.9 \times 10^3$  N                      (D)  $4.3 \times 10^2$  N
- Q.7** At point P, the car hits an area of ice and loses all frictional force on its tires. Which path does the car follow on the ice ?  
 (A) A    (B) B    (C) C    (D) D

**PASSAGE - 4**

Base your answers to questions 8, 9 and 10 on the information and diagram below.

A ball is thrown horizontally with an initial velocity of 20.0 meters per second from the top of a tower 60.0 meters high.



- Q.8** What is the initial vertical velocity of the ball ?  
 (A) 0 m/s    (B) 9.81 m/s    (C) 20.0 m/s    (D) 60.0 m/s
- Q.9** What is the approximate total time required for the ball to reach the ground ? [Neglect air resistance]  
 (A) 12.2 s    (B) 2.04 s    (C) 3.00 s    (D) 3.50 s
- Q.10** What is the horizontal velocity of the ball just before reaches the ground ? [Neglect air resistance]  
 (A) 9.81 m/s    (B) 20.0 m/s    (C) 34.3 m/s    (D) 68.6 m/s

**ANSWERS**

1. (A)                      2. (B)                      3. (D)                      4. (A)                      5. (D)                      6. (C)  
 7. (B)                      8. (A)                      9. (D)                      10. (B)