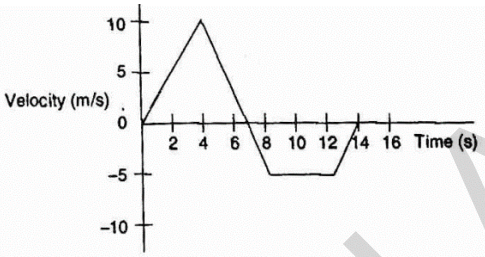
KINEMATICS

WORKING AREA

1. A bomb is dropped from a plane moving horizontally parallel to the ground at 100 km/hr. Assuming air resistance is negligible, calculate the altitude of the plane if the bomb reaches the ground after 5 seconds.
    A. 50 m
    B. 75 m
    C. 100 m
    D. 125 m
    E. 150 m

Question 2-4: refer to the following graph



2. Calculate the distance traveled during 14 seconds.
    A. 7.5 m
    B. 30 m
    C. 45.5 m
    D. 62.5 m
    E. 75 m

3. Calculate the displacement traveled during 14 seconds.
    A. 7.5 m
    B. 30 m
    C. 45.5 m
    D. 62.5 m
    E. 75 m

4. Calculate the magnitude of acceleration at t = 6 second.
    A. 2 m/s^2
    B. 3.75 m/s^2
    C. 5 m/s^2
    D. 10 m/s^2
    E. 15 m/s^2

5. A boy kicked a ball at an angle of 45° above the ground. Neglecting air resistance, compared to 45°, what would happen to the range of the ball if it was kicked at 30°?
   A. The range will increase.
   B. The range will remain the same.
   C. The range will decrease.
   D. Initial velocity must be known to compared both angles.
   E. Maximum height of the ball must be known to compared both angles.

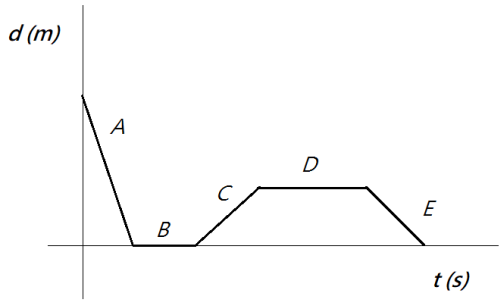
WORKING AREA

6. Which of the statement(s) is true for an object moving at constant speed?
   I. The acceleration must be zero.
   II. The velocity must be constant.
   III. It can be moving in circular motion.

   A. I only
   B. II only
   C. III only
   D. I and II only
   E. I, II, III

7. Which statement below is true when the ball reaches the maximum point of a projectile motion?
   A. The acceleration is zero and the velocity is zero.
   B. The acceleration is not zero and the velocity is zero.
   C. The acceleration is zero and the velocity is not zero.
   D. The acceleration is not zero and the velocity is not zero.
   E. None of the above.

Question 8-10 refer to the graph below **WORKING AREA**



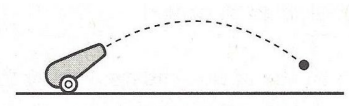
8. During which interval is the velocity decreasing?
   A. A only
   B. B and D only
   C. C only
   D. A and E only
   E. None of the above

9. During which in interval is the object moving at greatest speed?
   A. A
   B. B
   C. C
   D. D
   E. E

10. A ball is dropped from a tower of height *H*. When it reaches the bottom the final velocity is *v*. What the new velocity of it was dropped from *2H*?
   A. v
   B. $2\,v$
   C. $4\,v$
   D. $\frac{1}{2}\,v$
   E. $\sqrt{2}\,v$

Question 11-13 **WORKING AREA**

A projectile is launched at an angle from level ground. Assume air resistance is negligible.



A. Horizontal velocity
B. Vertical velocity
C. Horizontal acceleration
D. Vertical acceleration
E. Angle of launch

11. Which of the above choices is not constant throughout the flight of the projectile?

12. Which of the above choices is zero throughout the flight of the projectile?

13. Which of the above choice changes direction during the flight of the projectile?

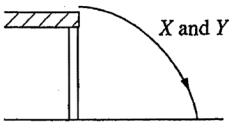
Question 14-15

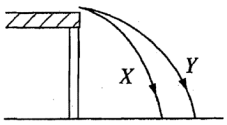
A ball is thrown horizontally at 40 m/s from a tower that strikes the ground after 3 seconds.

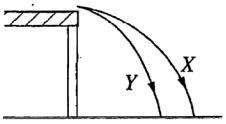
14. What is the height of the tower?
    A. 15 m
    B. 25 m
    C. 35 m
    D. 45 m
    E. 55 m
15. What is the final velocity of the tower?
    A. 30 m/s
    B. 40 m/s
    C. 50 m/s
    D. 60 m/s
    E. 70 m/s

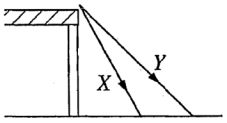
WORKING AREA

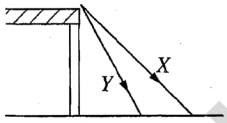
16. Two balls, X and Y, are thrown horizontally from a table. Given that ball Y is heavier than ball X and both balls roll off the table at the same velocity, neglecting air resistance, which of the following shows their correct trajectories?

(A) 

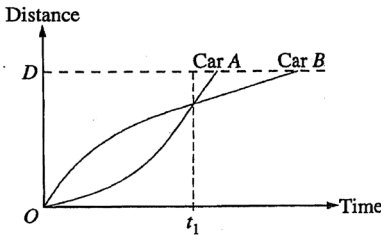
(B) 

(C) 

(D) 

(E) 

17. Two cars, A and B, begin moving from a starting line at time t = 0 and race over a total distance D. The graph shows their respective distances from the starting line as functions of time. Correct statements about the cars include which of the following?



I. At time t_1, car A has a greater speed than car B.
II. II. At time t_1, car A is closer to the finish line than car B.
III. Car A crosses the finish line first.

A. I only
B. II only
C. I and III only
D. II and III only
E. I, II, and III

Question 18-20 **WORKING AREA**

Five objects are moving in straight-line paths. The objects all start from rest at the same position and begin to move forward according to position-time table shown below.

Time	1	2	3	4	5
A	1 m	4 m	9 m	16 m	25 m
B	2 m	2 m	4 m	4 m	6 m
C	2 m	4 m	6 m	8 m	10 m
D	6 m	11 m	15 m	18 m	20 m
E	4 m	9 m	14 m	21 m	28 m

18. Which object is moving at constant velocity?

19. Which object could be in free fall, neglecting air resistance?

20. Which object's acceleration is opposite to its velocity?