

# Sample Paper – 2010

## Class – X

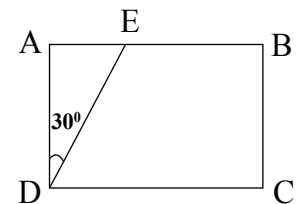
### Subject – Maths

#### SECTION – A (One mark each)

1. All the three face cards of spades are removed from a well shuffled pack of 52 cards. A card is then drawn at random from the remaining pack. Find the probability of getting a black face card.
2. Evaluate:  $\sin^2 35^\circ + \sin^2 55^\circ$ .
3. If one root of the quadratic equation  $3x^2 + px - 4 = 0$  is 4, find the value of p.
4. Find the value of k for which the following systems of linear equations have no solution:
5. Find the value of k, if  $x = \frac{2}{3}$  is a solution of equation  $kx^2 - x - 2 = 0$ ?
6. Evaluate:  $19 \operatorname{cosec}^2 A - 19 \cot^2 A$ .
7. Two players A and B play tennis match. It is known that probability of A winning the match is 0.62. Find the probability of B winning the match.
8. Find the value of k for which the system of equations:  $x - ky = 2$ ,  $3x + 2y + 7 = 0$  has exactly one solution?

#### SECTION – B (Two marks each)

9. In the given figure, ABCD is rectangle with AD = 12 cm and DC = 20 cm. Line segment DE is drawn making an angle of  $30^\circ$  with AD intersecting AB at E. Find the lengths of DE and AE.



OR

If  $5 \cos A - 12 \sin A = 0$ , find the value of  $\frac{2 \sin A + \cos A}{2 \cos A - \sin A}$ .

10. For what value of k,  $(4 - k)x^2 + (2k + 4)x + (8k + 1) = 0$  is a perfect square?
11. It is known that out of 750 bulbs in a box, 25 bulbs are defective. One bulb is taken out at random from the box. What is the probability that it is (i) not defective (ii) not good?
12. Solve the following system of linear equations by Substitution method:  
 $x - y = 0.9$ ;  $\frac{11}{2(x + y)} = 1$ .

13. Solve:  $x = \sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}}}}$ .

**OR**

Solve for x:  $x = 2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \dots}}}$ .

14. A card is drawn from a well shuffled deck of 52 playing cards. Find the probability that it is not an ace.

**SECTION – C (Three marks each)**

15. Evaluate:  $\sin^2 30^\circ \cdot \cos^2 45^\circ + 4 \tan^2 30^\circ + \frac{1}{2} \sin^2 90^\circ - 2 \cos^2 90^\circ + \frac{1}{24}$ .

16. Use simple graph paper and draw the graph of the equations:  $2y - x = 8$ ,  $5y - x = 14$ ,  $y - 2x = 1$ . Obtain the vertices of the triangle so formed.

17. Prove that:  $\frac{\tan \theta}{1 - \cot \theta} + \frac{\cot \theta}{1 - \tan \theta} = 1 + \tan \theta + \cot \theta$ .

**OR**

If  $\sec \theta = x + \frac{1}{4x}$ , then prove that  $\sec \theta + \tan \theta = 2x$  or  $\frac{1}{2x}$ .

18. Two customers Shyam and Ekta are visiting a particular shop in the same week (Tuesday to Saturday). Each is equally likely to visit the shop on any day as on another day. Find the probability that both will visit the shop on  
 (i) the same day                      (ii) consecutive days                      (iii) different days.

**OR**

A jar contains 14 marbles. Some of them are green and others are blue. If a marble is drawn at random from the jar, the probability that it is green is  $\frac{2}{3}$ . Find the number of blue marbles in the jar.

19. Solve the following quadratic equations:  $6 \left( \frac{x - 3}{2x + 1} \right) - 5 \sqrt{\frac{x - 3}{2x + 1}} + 1 = 0$ .

20. A boat goes 24 km upstream and 28 km downstream in 6 hrs. It goes 30 km upstream and 21 km downstream in  $6\frac{1}{2}$  hrs. Find the speed of the boat in still water and also the speed of stream.

**SECTION – D (Six marks each )**

21. An aeroplane takes an hour less for a journey of 1200 km if its speed is increased by 100 km/h from its usual speed. Find its usual speed.

**OR**

Two pillars of equal heights stand on the either side of the roadway 150 m wide. From a point on the roadway between the pillars, the angles of elevation of the top of the pillars are  $60^\circ$  and  $30^\circ$ . Find the height of pillars and the position of the point.

22. The angry Arjun carried some arrows for fighting with Bheeshm. With half the arrows he cut down the arrows thrown by Bheeshm on him and with six other arrows he killed the charioteer of Bheeshm. With one arrow each he knocked down respectively the rath, flag and bow of Bheeshm. Finally with one more than four times the square root of arrows he laid Bheeshm unconscious on an arrow-bed. Find the total number of arrows Arjun had.