

CLASS X

MCQ QUESTIONS BASED ON SA2 SYLLABUS

QUADRATIC EQUATIONS

MULTIPLE CHOICE QUESTIONS

Mark the correct alternative in each of the following :

- If one root of $2x^2 + kx - 6 = 0$ is 6, the value of k is :
(a) -11 (b) 11 (c) 2 (d) 3
 - The roots of quadratic equation $\sqrt{3}x^2 + 10x + 7\sqrt{3} = 0$ are :
(a) $-\sqrt{3}$ and $\frac{7}{\sqrt{3}}$ (b) $\sqrt{3}$ and $\frac{7}{\sqrt{3}}$ (c) $-\sqrt{3}$ and $\frac{-7}{\sqrt{3}}$ (d) none of these
 - The value(s) of x satisfying the equation $a^2x^2 - 3abx + 2b^2 = 0$ is :
(a) $\frac{2b}{a}, \frac{b}{a}$ (b) $\frac{-2b}{a}, \frac{-b}{a}$ (c) $\frac{2b}{a}, \frac{-b}{a}$ (d) none of these
-
- The discriminant of the quadratic equation $3x^2 - 8x + 3 = 0$ is :
(a) -100 (b) 53 (c) 28 (d) none of these
 - The value(s) of k for which the equation $(k+1)x^2 - 2(k-1)x + 1 = 0$ has real and equal roots is:
(a) $k=0, -3$ (b) $k=0, 3$ (c) $k=0, 4$ (d) none of these
 - The value(s) of k for which the equation $9x^2 + 3kx + 4 = 0$ has real roots is :
(a) $k \leq -4$ or $k \geq 4$ (b) $k \leq 4$ or $k \geq -4$ (c) $k \leq -2$ or $k \geq 2$ (d) $k \leq 2$ or $k \geq -2$
 - The value of $\sqrt{12 + \sqrt{12 + \sqrt{12 + \dots}}}$ is :
(a) -2 (b) -4 (c) 2 (d) 4
 - If the equation $x^2 - kx + 1 = 0$ does not possess real roots, then :
(a) $-3 < k < 3$ (b) $-2 < k < 2$ (c) $k > 2$ (d) $k < -2$
 - The value of k for which the equation :
 $(4-k)x^2 + (2k+4)x + (8k+1) = 0$ is a perfect square, is :
(a) $k=0, 3$ (b) $k=0, -3$ (c) $k=3, -3$ (d) none of these
 - The value of m for which the roots of the equation $(3m+1)x^2 + (m+11)x + 9 = 0$ are equal, is :
(a) $m=-1, m=85$ (b) $m=-1, m=-85$ (c) $m=1, m=85$ (d) none of these

ANSWERS OF MULTIPLE CHOICE QUESTIONS

- | | | | | |
|--------|--------|--------|--------|---------|
| 1. (a) | 2. (c) | 3. (a) | 4. (c) | 5. (b) |
| 6. (a) | 7. (d) | 8. (b) | 9. (a) | 10. (c) |

ARITHMETIC PROGRESSION

MULTIPLE CHOICE QUESTIONS

Mark the correct alternative in each of the following :

1. Which of the following sequence whose n^{th} term is given by a_n , is not an A.P. :
(a) $a_n = 3 - 2n$ (b) $a_n = 3n - 7$ (c) $a_n = 2n^2 + 1$ (d) $a_n = -7n + 5$
 2. The 32nd term of an AP, whose 10th term is 52 and 16th term is 82, is:
(a) 162 (b) 152 (c) 172 (d) none of these
 3. In m^{th} term of an AP is $\frac{1}{n}$, and n^{th} term is $\frac{1}{m}$, then its $(mn)^{\text{th}}$ term is :
(a) 0 (b) 1 (c) $\frac{mn}{m+n}$ (d) $\frac{m+n}{mn}$
 4. The total number of terms in an A.P. $18, 15\frac{1}{2}, 13, \dots, -47$ are :
(a) 20 (b) 25 (c) 27 (d) 30
 5. The total number of multiples of 4, between 10 and 250 are :
(a) 45 (b) 50 (c) 60 (d) none of these
 6. If n^{th} term of an A.P. is $(2n + 1)$, then the sum of first n terms of the A.P. is :
(a) $n(n+1)$ (b) $n(n+2)$ (c) $n(n+3)$ (d) none of these
 7. The sum of all three digit natural numbers, which are divisible by 7, is :
(a) 70336 (b) 70784 (c) 64064 (d) none of these
 8. The total numbers of terms of A.P. 9, 17, 25, that must be taken so that their sum is 636, is :
(a) 10 (b) 11 (c) 12 (d) 13
 9. If the sum of n terms of an A.P. is $2n^2 + 5n$ then its n^{th} term is :
(a) $4n - 3$ (b) $3n - 4$ (c) $4n + 3$ (d) $3n + 4$
 10. If the first term of an A.P. is 2 and common difference is 4, then the sum of its 40 terms is :
(a) 3200 (b) 1600 (c) 2000 (d) 3000
-

ANSWERS OF MULTIPLE CHOICE QUESTIONS

- | | | | | |
|--------|--------|--------|--------|---------|
| 1. (c) | 2. (a) | 3. (b) | 4. (c) | 5. (c) |
| 6. (b) | 7. (a) | 8. (c) | 9. (c) | 10. (a) |
-

COORDINATE GEOMETRY

MULTIPLE CHOICE QUESTIONS

Mark the correct alternative in each of the following :

1. The distance between the points (a, b) and $(-b, a)$ is :
(a) $2\sqrt{a^2+b^2}$ (b) $\sqrt{a^2+b^2}$ (c) $\sqrt{2(a^2+b^2)}$ (d) none of these
2. If the distance between the points $(1, 0)$ and $(4, a)$ is 5, then value of a is :
(a) ± 4 (b) 4 (c) -4 (d) none of these
3. A line segment is of length 10 units. If the coordinates of its one end are $(2, -3)$ and the abscissa of the other end is 10, then its ordinate is :
(a) 9, 6 (b) 3, -9 (c) -3, 9 (d) 9, -6
4. The value of k for which the points $(k, -1)$, $(2, 1)$ and $(4, 5)$ are collinear is:
(a) 0 (b) 1 (c) -1 (d) 2
5. The point of intersection of y -axis and the perpendicular bisector of the line segment joining the points $(3, 6)$ and $(-3, 4)$ is :
(a) $(0, 4)$ (b) $(0, -4)$ (c) $(0, 5)$ (d) $(0, -5)$
6. The vertices of a triangle are $(-2, 0)$, $(2, 3)$ and $(1, -3)$. The triangle is
(a) equilateral (b) isosceles (c) right (d) scalene
7. The coordinates of the point which divide the join of $(-1, 7)$ and $(4, -3)$ in the ratio 2 : 3 is :
(a) $(1, 2)$ (b) $(1, 3)$ (c) $(-2, 3)$ (d) none of these
8. The ratio in which the join of $(1, -5)$ and $(-4, 5)$ is divided by x -axis is :
(a) 1 : 1 (b) 1 : 2 (c) 2 : 3 (d) 3 : 5
9. If $(1, 2)$, $(4, y)$, $(x, 6)$ and $(3, 5)$ are the vertices of a parallelogram taken in order, then the value of x and y is :
(a) $x = 3, y = -6$ (b) $x = -6, y = 3$ (c) $x = 6, y = 3$ (d) $x = 6, y = -3$
10. The area of a rhombus (in sq. units) whose vertices taken in order are $(3, 0)$, $(4, 5)$, $(-1, 4)$ and $(-2, -1)$ is:
(a) 12 (b) 24 (c) 48 (d) none of these
11. The vertices of a triangle are $(3, -5)$, $(-7, 4)$ and $(10, -2)$. The coordinates of its centroid is :
(a) $(-2, 1)$ (b) $(-2, -1)$ (c) $(2, -1)$ (d) $(1, 2)$
12. If the centroid of a triangle formed by $(7, x)$, $(y, -6)$ and $(9, 10)$ is at $(6, 3)$, then $(x, y) =$
(a) $(4, 5)$ (b) $(5, 4)$ (c) $(-5, -2)$ (d) $(5, 2)$
13. The area of the triangle formed by $(a, b+c)$, $(b, c+a)$ and $(c, a+b)$ is :
(a) abc (b) $a+b+c$ (c) $a^2b^2c^2$ (d) 0
14. The value of k for which the points $\left(2, \frac{3}{2}\right)$, $\left(-3, \frac{-7}{2}\right)$ and $\left(k, \frac{9}{2}\right)$ are collinear is :
(a) 4 (b) 5 (c) $\frac{-5}{2}$ (d) $\frac{5}{2}$
15. If the area of the triangle formed by the points $(x, 2x)$, $(-2, 6)$ and $(3, 1)$ is 5 sq. units, then value of x is :
(a) $\frac{2}{3}$ or 2 (b) $\frac{3}{5}$ or 2 (c) 3 (d) 5

ANSWERS OF MULTIPLE CHOICE QUESTIONS

- | | | | | |
|---------|---------|---------|---------|---------|
| 1. (c) | 2. (a) | 3. (b) | 4. (b) | 5. (c) |
| 6. (d) | 7. (b) | 8. (a) | 9. (c) | 10. (b) |
| 11. (c) | 12. (d) | 13. (d) | 14. (b) | 15. (a) |

SOME APPLICATIONS OF TRIGONOMETRY

MULTIPLE CHOICE QUESTIONS

Mark the correct alternative in each of the following :

- The angle of elevation of the top of a tower from a point on the ground which is 60 m away from the foot of the tower is 30° . The height of the tower is :
(a) $10\sqrt{3}$ m (b) $15\sqrt{3}$ m (c) $20\sqrt{3}$ m (d) none of these
- A kite is flying at a height of 60 m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is 45° . The length of the string, assuming that there is no slack in the string is :
(a) $60\sqrt{2}$ m (b) $40\sqrt{3}$ m (c) $60\sqrt{3}$ m (d) $40\sqrt{2}$ m
- An electrician has to repair an electric fault on a pole of height 4 m. He needs to reach a point 1.3 m below the top of the pole to undertake the repair work. The length of the ladder that he should use which when inclined at an angle of 60° to the horizontal would enable him to reach the required position is :
(a) $\frac{3\sqrt{3}}{5}$ m (b) $\frac{6\sqrt{3}}{5}$ m (c) $\frac{9\sqrt{3}}{5}$ m (d) none of these
- A tree is broken by the wind. The top struck the ground at an angle of 30° and at a distance of 30 m from the root. The whole height of the tree is :
(a) $10\sqrt{3}$ m (b) $20\sqrt{3}$ m (c) 51.96 m (d) 63.96 m
- The shadow of a flag-staff is three times as long as the shadow of the flag-staff when the sun rays meet the ground at an angle of 60° . The angle between the sun rays and the ground at the time of longer shadow is :
(a) 30° (b) 45° (c) 60° (d) none of these
- The angle of elevation of the top Q of a vertical tower PQ from a point X on the ground is 60° . At a point Y, 40 m vertically above X, the angle of elevation is 45° . The height of the tower PQ and the distance XQ respectively are :
(a) 84.62 m, 103.6 m (b) 94.64 m, 109.3 m (c) 54.64 m, 327.9 m (d) 94.64 m, 327.9 m
- A vertical tower stands on a horizontal plane and is surmounted by a vertical flag-staff of height 5 metres. At a point on the plane, the angles of elevation of the bottom and the top of the flag-staff are respectively 30° and 60° . The height of the tower is :
(a) 2 m (b) 3 m (c) 2.5 m (d) 3.5 m
- A 1.2 m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2 m from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant is 60° . After some time, the angle of elevation reduces to 30° . The distance travelled by the balloon during this interval is:
(a) $\frac{147}{5}\sqrt{3}$ m (b) $\frac{147}{5}\sqrt{2}$ m (c) $58\sqrt{3}$ m (d) $58\sqrt{2}$ m
- The angles of elevation of the top of a rock from the top and foot of a 100 m high tower are 45° and 60° respectively. The height of the rock is :
(a) 136.50 m (b) 236.50 m (c) 250 m (d) none of these
- As observed from the top of a lighthouse, 100 m high above sea level, the angle of depression of a ship, sailing directly towards it, changes from 30° to 45° . The distance travelled by the ship during the period of observation is :
(a) 60 m (b) 70 m (c) 73 m (d) 80 m

ANSWERS OF MULTIPLE CHOICE QUESTIONS

- | | | | | |
|--------|--------|--------|--------|---------|
| 1. (c) | 2. (a) | 3. (c) | 4. (c) | 5. (a) |
| 6. (b) | 7. (c) | 8. (c) | 9. (b) | 10. (c) |

CIRCLES

MULTIPLE CHOICE QUESTIONS

Mark the correct alternative in each of the following :

1. The length of a tangent from a point 25 cm from the centre of a circle is 24 cm. The radius of the circle is:
(a) 5 cm (b) 7 cm (c) 10 cm (d) 12 cm
2. A tangent PQ at a point P of a circle of radius 8 cm meets a line through the centre O at a point Q such that OQ = 15 cm. Length PQ is :
(a) 17 cm (b) 10 cm (c) $\sqrt{125}$ cm (d) none of these
3. A circle touches all the four sides of a quadrilateral ABCD. Then,
(a) $AB + CD = AC + BC$ (b) $AB + CD = BC + AD$
(c) $AC + AD = BD + CD$ (d) $AC + BD = BC + DB$
4. Two circles of radii 10 cm and 8 cm are concentric. The length of a chord of the larger circle which touches the smaller is :
(a) 6 cm (b) 11 cm (c) 12 cm (d) 13 cm
5. A circle with centre O is inscribed in a right angle triangle ABC, right angled at B. If $BC = 15$ cm, $AC = 17$ cm, the radius 'r' of the circle is :
(a) 2 cm (b) 2.5 cm (c) 3 cm (d) 5 cm
6. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. The length of TP is :
(a) 5 cm (b) $5\frac{2}{3}$ cm (c) 6 cm (d) $6\frac{2}{3}$ cm
7. If TP and TQ are tangents to a circle with centre O such that $\angle POQ = 110^\circ$, then $\angle PTQ$ is equal to :
(a) 60° (b) 70° (c) 80° (d) 90°
8. Two circles touch each other externally at C and AB is a common tangent to the circles. Then, $\angle ACB$ is:
(a) 60° (b) 45° (c) 30° (d) 90°
9. A circle touches all the four sides of a quadrilateral ABCD, with $AB = 7$ cm, $BC = 8$ cm and $CD = 5$ cm. The length of AD is :
(a) 3 cm (b) 4 cm (c) 5 cm (d) 6 cm
10. PQ is a tangent drawn from a point P to a circle with centre O and QOR is a diameter of the circle such that $\angle POR = 120^\circ$, then $\angle OPQ$ is :
(a) 45° (b) 60° (c) 90° (d) 30°

ANSWERS OF MULTIPLE CHOICE QUESTIONS

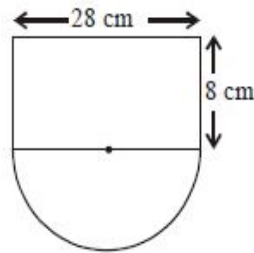
- | | | | | |
|--------|--------|--------|--------|---------|
| 1. (b) | 2. (a) | 3. (b) | 4. (c) | 5. (c) |
| 6. (d) | 7. (b) | 8. (d) | 9. (b) | 10. (d) |

AREAS RELATED TO CIRCLES

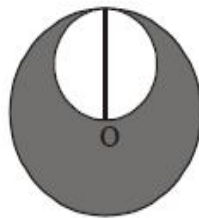
MULTIPLE CHOICE QUESTIONS

Mark the correct alternative in each of the following :

1. A circular track has an inside circumference of 440 m. If the width of the track is 7 m, the outside circumference is :
(a) 441 m (b) 484 m (c) 625 m (d) none of these
2. The radius of a car wheel is 49 cm. The number of times the wheel of a car rotate in a journey of 1925 m is:
(a) 525 (b) 600 (c) 625 (d) 725
3. The given figure consists of a rectangle and a semicircle. The area of the figure is :
(a) 432 cm² (b) 450 cm² (c) 532 cm² (d) 550 cm²

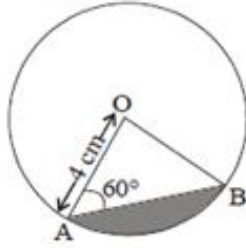


4. A student takes a rectangular piece of a paper 30 cm long and 21 cm wide. The area of the greatest circle he can cut from the paper is :
(a) 246.5 cm² (b) 346.5 cm² (c) 446.5 cm² (d) none of these
5. In the given figure, the larger circle has the radius 8 cm with O as its centre. The area of the shaded region is :

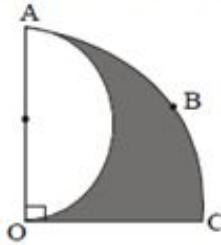


- (a) 150.85 cm² (b) 200.75 cm² (c) 250.85 cm² (d) none of these
6. The minute hand of a clock is 7 cm long. The area traced out by the minute hand of the clock between 5 : 15 pm to 5 : 35 pm on a day is :
(a) $50\frac{1}{3}$ cm² (b) $51\frac{1}{3}$ cm² (c) $52\frac{1}{3}$ cm² (d) none of these
 7. In an equilateral triangle of side 24 cm, a circle is inscribed touching its sides. The area of the remaining portion of the triangle is:
(a) 88.55 cm² (b) 90.55 cm² (c) 95.55 cm² (d) 98.55 cm²

8. In the given figure, the area of the shaded segment of the circle with centre O is



- (a) 1.45 cm^2 (b) 2.15 cm^2 (c) 3.25 cm^2 (d) 4.75 cm^2
9. The perimeter of a sector of a circle of radius 9 cm is 33 cm. The area of this sector is :
- (a) 57.6 cm^2 (b) 61.25 cm^2 (c) 67.5 cm^2 (d) none of these
10. OABC is a quadrant with radius 14 cm and a semi-circle with OA as diameter. The area of the shaded portion is :



- (a) 55 cm^2 (b) 66 cm^2 (c) 77 cm^2 (d) 88 cm^2

ANSWERS OF MULTIPLE CHOICE QUESTIONS

- | | | | | |
|--------|--------|--------|--------|---------|
| 1. (b) | 2. (c) | 3. (c) | 4. (b) | 5. (a) |
| 6. (b) | 7. (d) | 8. (a) | 9. (c) | 10. (c) |

SURFACE AREAS AND VOLUMES

MULTIPLE CHOICE QUESTIONS

Mark the correct alternative in each of the following :

- The height of a right circular cone is 12 cm. If its volume is $100\pi \text{ cm}^3$, its slant height is:

(a) 18 cm (b) 20 cm (c) 13 cm (d) none of these
- The volume of a largest sphere which is carved out of a cube of side 21 cm is :

(a) 3951 cm^3 (b) 4851 cm^3 (c) 5351 cm^3 (d) none of these
- A solid cylinder of brass 8 m high and 4 m in diameter is melted and recast into a cone of diameter 3m. The height of the cone is :

(a) $42\frac{2}{3} \text{ m}$ (b) 42 m (c) $45\frac{1}{3} \text{ m}$ (d) none of these
- A cone is 8.4 cm high and radius of its base is 2.1 cm. It is melted and recast into a sphere. The radius of the sphere is

(a) 2 cm (b) 2.1 cm (c) 3.5 cm (d) none of these
- The diameter of a metallic sphere is 6 cm. The sphere is melted and drawn into a wire of uniform circular cross-section. If the length of the wire is 36 m, its radius is :

(a) 0.5 mm (b) 1 mm (c) 2 mm (d) 4 mm

6. A spherical object of radius 14 cm is dropped into water contained in a right circular cylindrical vessel of radius 21 cm. If the object is completely immersed, the level of water is raised by :
 (a) 6.5 cm (b) 7.3 cm (c) 8.3 cm (d) none of these
7. Marbles of diameter 1.4 cm are dropped into a cylindrical beaker, of diameter 7 cm, containing some water. The number of marbles that should be dropped into the beaker so that the water level rises by 5.6 cm, is:
 (a) 50 (b) 100 (c) 150 (d) 200
8. A cone and a hemisphere have equal bases and equal volumes. The ratio of their heights is :
 (a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 3 : 1
9. A cylinder whose height is two-third of its diameter has the same volume as a sphere of radius 4 cm. The radius of the base of the cylinder is :
 (a) 2 cm (b) 3 cm (c) 4 cm (d) 6 cm
10. The diameter of a copper sphere is 18 cm. The sphere is melted and is drawn into a long wire of uniform circular cross-section. If the length of the wire is 108 m, its diameter is :
 (a) 0.3 cm (b) 0.6 cm (c) 0.8 cm (d) none of these
11. A circus tent is cylindrical to a height of 4 m and conical above it, if its diameter is 105 m and its slant height is 40 m, the total area of the canvas required in m^2 is :
 (a) 2560 (b) 3760 (c) 7920 (d) none of these
12. A hollow spherical shell is made of density $\frac{4}{9} \text{ g/cm}^3$. If its internal and external radii are 8 cm and 9 cm respectively, the weight of the shell is : [use $\pi = 3.141$]
 (a) 203.91 g (b) 303.91 g (c) 403.91 g (d) 503.91 g
13. The rainwater from a roof $22 \text{ m} \times 20 \text{ m}$ drains into a conical vessel having a diameter of base as 2m and height 3.5 m. If the vessel is just full, the rainfall is :
 (a) $\frac{4}{5} \text{ cm}$ (b) $\frac{5}{6} \text{ cm}$ (c) $\frac{6}{7} \text{ cm}$ (d) none of these
14. The number of spherical bullets each of diameter 2 cm which can be made out of a cube of lead whose edge measures 22 cm is
 (a) 1550 (b) 2050 (c) 2241 (d) 2541
15. A reservoir is in the shape of a frustum of a right circular cone. It is 8 m across at the top and 4m across at the bottom. If it is 6 m deep, then its capacity is :
 (a) 176 m^3 (b) 186 m^3 (c) 216 m^3 (d) 254 m^3

ANSWERS OF MULTIPLE CHOICE QUESTIONS

- | | | | | |
|---------|---------|---------|---------|---------|
| 1. (c) | 2. (b) | 3. (a) | 4. (b) | 5. (b) |
| 6. (c) | 7. (c) | 8. (b) | 9. (c) | 10. (b) |
| 11. (c) | 12. (c) | 13. (b) | 14. (d) | 15. (a) |

PROBABILITY

MULTIPLE CHOICE QUESTIONS

Mark the correct alternative in each of the following :

- In a single throw of a die, the probability of getting a multiple of 3 is :
(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{6}$ (d) $\frac{2}{3}$
- Which of the following cannot be the probability of an event?
(a) $\frac{3}{5}$ (b) -0.4 (c) 35% (d) 0.67
- If $P(A) = 0.04$, then $P(\text{Not } A)$ is :
(a) -0.06 (b) 0.04 (c) 0.9 (d) 0.96
- The probability that a number selected at random from the number 1, 2, 2, 3, 3, 3, 4, 4, 4, 4 will be their average is
(a) $\frac{2}{5}$ (b) $\frac{3}{5}$ (c) $\frac{3}{10}$ (d) none of these
- Pranshi and Ria are friends. The probability that both will have same birthday (ignoring a leap year) is:
(a) $\frac{1}{365}$ (b) $\frac{2}{365}$ (c) $\frac{1}{(365)^2}$ (d) none of these
- Two dice are thrown once. The probability of getting a total of 7 or 9 is :
(a) $\frac{1}{9}$ (b) $\frac{2}{9}$ (c) $\frac{5}{18}$ (d) $\frac{7}{18}$
- Three coins are tossed once. The probability of getting at least 2 heads is :
(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{3}{8}$ (d) none of these
- A card is drawn at random from a well shuffled deck of 52 cards. The probability of getting a face card of black colour is :
(a) $\frac{1}{26}$ (b) $\frac{1}{13}$ (c) $\frac{3}{26}$ (d) $\frac{5}{26}$
- There are 30 cards, of same size, in a bag on which numbers 1 to 30 are written. Once a card is taken out of the bag at random. The probability that the number on the selected card is not divisible by 3, is :
(a) $\frac{1}{3}$ (b) $\frac{3}{4}$ (c) $\frac{2}{3}$ (d) $\frac{5}{6}$
- A bag contains 5 white balls, 3 black balls and 4 white balls. A ball is drawn out of the bag at random. The probability that the ball is red or white is :
(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{1}{4}$ (d) none of these

ANSWERS OF MULTIPLE CHOICE QUESTIONS

- | | | | | |
|--------|--------|--------|--------|---------|
| 1. (b) | 2. (b) | 3. (d) | 4. (c) | 5. (a) |
| 6. (c) | 7. (a) | 8. (c) | 9. (c) | 10. (a) |