Class 10   **Maths**   Date 19.8.2024

Chapter-1. Goods and Services Tax (GST)

Choose the correct option :

1. The percentage share of SGST of total GST for an intra-state sale of an article is :
   (a) 25%   (b) 50%   (c) 75%   (d) 100%

2. A customer bought a mobile from a dealer at a discount of 20% on the marked price of ₹ 40,000. If the rate of GST is 18%, then the tax paid by the customer is :
   (a) ₹ 4760   (b) ₹ 2880   (c) ₹ 5760   (d) none of these

3. Goods are sold from Panipat to Jammu for ₹ 30,000. If the rate of GST is 18%, then IGST to be paid is :
   (a) ₹ 5400   (b) ₹ 2700   (c) ₹ 3600   (d) ₹ 1800

4. The marked price of a sofa-set is ₹ 37,250. A dealer allows a discount of 6% on it and then charges GST at the rate of 12%. What amount is to paid for the purchase of the sofa-set ?
   (a) ₹ 39,216.80   (b) ₹ 29,216.80   (c) ₹ 49,216.80   (d) none of these

5. A dealer purchased goods for ₹ 1,00,000 and sold them for ₹ 1,40,000 within the state. If the rate of GST is 12%, the net SGST paid by the dealer is :
   (a) ₹ 4,800   (b) ₹ 2,400   (c) ₹ 8,400   (d) none of these

6. A shopkeeper buys an article for a wholesaler for ₹ 25,000 and sells it to a consumer at 20% profit. If the rate of GST is 18%, then what is tax liability of the shopkeeper ?
   (a) ₹ 600   (b) ₹ 400   (c) ₹ 900   (d) none of these

7. A person purchased an article for ₹ 4,956 inclusive of GST. If the marked price of the article is ₹ 4,200, then the rate of GST is :
   (a) 6%   (b) 12%   (c) 8%   (d) 18%

8. A dealer in Lucknow sold a printer to a customer in Lucknow for ₹ 28,000. If SGST is ₹ 2,520, then the rate of GST is :
   (a) 12%   (b) 18%   (c) 9%   (d) 28%

9. For an intra-state transaction, a customer paid ₹ 1,080 in the form of CGST, if the same transaction is done in inter-state mode, then what will be the amount of IGST ?
   (a) ₹ 1,080   (b) ₹ 540   (c) ₹ 2,160   (d) none of these

10. The full form of GST is :
    (a) Government Service Tax   (b) Government Sales Tax
    (c) Goods and Sales Tax   (d) Goods and Services Tax

11. Some goods were sold from Nagpur to Haridwar, MRP being ₹ 10,000 at a discount of 10%. The rate of GST levied is 28%, then the IGST is :
    (a) ₹ 2,520   (b) ₹ 5,040   (c) Nil   (d) none of these

12. A desktop computer is marked for sale at ₹ 17,360, inclusive of 12% GST, then the amount of GST is :
    (a) ₹ 1,680   (b) ₹ 1,860   (c) ₹ 1,960   (d) none of these

13. A customer buys some commodities for ₹ 6,000 from a dealer in the same city. If the rate of GST is 18%, then how much he has to pay for these commodities bought ?
    (a) ₹ 6,080   (b) ₹ 5,080   (c) ₹ 7,080   (d) none of these

14. For 5 items being bought at the rate of ₹ 2,000 each, discounted at 10% GST of 18% is levied, then what is the total amount paid including GST ?
    (a) ₹ 10,620   (b) ₹ 12,620   (c) ₹ 14,620   (d) none of these

15. The SGST paid by a customer to the shopkeeper for an article which is priced at ₹ 500 is ₹ 15. The rate of GST charged is :

    (a) 1.5%   (b) 3%   (c) 5%   (d) 6%

ANSWERS

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

Chapter-2. Banking (Recurring Deposit Accounts)

Choose the correct option :

1. A person deposited ₹ 500 per month in a recurring deposit account for 2 years. If the bank pays interest at 8% p.a., then the interest he gets at the time of maturity is :

    (a) ₹ 1,000   (b) ₹ 1,100   (c) ₹ 1,200   (d) ₹ 1,500

2. A lady deposited ₹ 200 per month for 36 months in a bank's recurring deposit account. If the bank pays interest at the rate of 11% p.a., what will the amount she gets on maturity ?

    (a) ₹ 9,421   (b) ₹ 7,421   (c) ₹ 8,421   (d) none of these

3. John has a recurring deposit account in a bank for 2 years at 6% p.a. simple interest. If he gets ₹ 1,200 as interest at the time of maturity, then the monthly instalment is :

    (a) ₹ 500   (b) ₹ 600   (c) ₹ 700   (d) ₹ 800

4. Biswas deposits ₹ 1,000 every month in a recurring deposit account for 3 years at 8% interest p.a. Find the matured value.

    (a) ₹ 40,400   (b) ₹ 40,440   (c) ₹ 44,400   (d) none of these

5. A man opened a recurring deposit account in a bank and deposited ₹ 800 per month for $1\frac{1}{2}$ years. If he received ₹ 15,084 at the time of maturity, what is the rate of interest per annum ?

    (a) 6% p.a.   (b) 5% p.a.   (c) 7% p.a.   (d) none of these

ANSWERS

1. (a)	2. (c)	3. (d)	4. (b)	5. (a)

Chapter-3. Shares and Dividends

Choose the correct option :

1. A person invests ₹ 14,950 in ₹ 100 shares of a company, paying 14% dividend. If his annual income from shares be ₹ 1,610, then the market value of each share is :

    (a) ₹ 120   (b) ₹ 130   (c) ₹ 140   (d) none of these

2. If the dividend received from 9%, ₹ 20 shares is ₹ 1,620, then the number of shares purchased is :

    (a) 900   (b) 1,200   (c) 400   (d) none of these

3. The investment in buying 280 shares at ₹ 40 each at 25% premium is :

    (a) ₹ 11,200   (b) ₹ 14,000   (c) ₹ 16,800   (d) ₹ 8,400

4. A man invests ₹ 24,000 on ₹ 60 shares at a discount of 20%. If the dividend declared by the company is 10%, then his annual income is :

    (a) ₹ 2,880   (b) ₹ 1,500   (c) ₹ 3,000   (d) none of these

5. Find the total investment in buying 400 shares at ₹ 80 each at 10% discount.

    (a) ₹ 26,800   (b) ₹ 25,800   (c) ₹ 24,800   (d) ₹ 28,800

6. A company declares 8% dividend to the share holders. If a man receives ₹ 2,840 as his dividend, find the nominal value of his shares.
   (a) ₹ 35,500 (b) ₹ 36,500 (c) ₹ 37,500 (d) none of these

7. How much should a man invest in ₹ 25 shares selling at ₹ 30 to obtain an income of ₹ 450, if the dividend declared is 15% ?
   (a) ₹ 2,400 (b) ₹ 6,000 (c) ₹ 3,600 (d) none of these

8. What would be the total investment in buying 400 shares at ₹ 80 each at 10% discount ?
   (a) ₹ 10,000 (b) ₹ 11,000 (c) ₹ 20,000 (d) none of these

9. A man buys ₹ 10 share at a premium of ₹ 5. If the company pays 9% dividend, what will be the percent return on his investment in buying 200 shares ?
   (a) 6% (b) 8% (c) 10% (d) none of these

10. ₹ 100 shares of a company are sold at a discount of ₹ 20. If the return on the investment is 15%, then what is the rate of dividend ?
   (a) 6% (b) 10% (c) 12% (d) 14%

ANSWERS

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

UNIT-2 ALGEBRA

Chapter-4. Linear Inequations in One Variable

Choose the correct option :

1. If $25 - 4x \leq 16$, then the smallest value of x, where $x \in R$ is :
   (a) 2 (b) $2\frac{1}{4}$ (c) 3 (d) none of these

2. If $2 + 4x < 2x - 5 \leq 3x$, $x \in Z$, then the solution set is :
   (a) {5, 4} (b) {–5, –4} (c) {–5, –4, –3} (d) {–4, –3, –2, –1}

3. If $x \in R$, the solution set of $6 \leq -3(2x - 4) < 12$ is :
   (a) $\{x : x \in R, 0 \leq x < 1 \}$
   (b) $\{x : x \in R, 0 < x < 1\}$
   (c) $\{x : x \in R, 0 < x \leq 1 \}$
   (d) none of these

4. If $x \in Z$, then the solution set of inequation $1 < 3x + 5 \leq 11$ is :
   (a) {–1, 0, 1, 2} (b) {–2, –1, 0, 1} (c) {–1, 0, 1} (d) {0, 1, 2}

5. On solving the inequality $2(x - 2) < 3x - 2$, $x \in \{-3, -2, -1, 0, 1, 2, 3\}$, the solution set is :
   (a) {0, 1, 2, 3} (b) {–1, 0, 1, 2} (c) {–1, 0, 1, 2, 3} (d) none of these

6. Given, $5 - 2x < 5\frac{1}{2} - \frac{5x}{3}$. Find the smallest value of x, when $x \in I$
   (a) 1 (b) 0 (c) 2 (d) – 1

7. In the above inequality, the smallest value of x, when $x \in W$.
   (a) 1 (b) 0 (c) 2 (d) none of these

8. In the inequality given in Q.6, what is the smallest value of x, when $x \in N$.
   (a) 1 (b) 2 (c) 3 (d) none of these

9. The solution set for $3x + 5 < 10 - 2x$, for $n \in N$.
   (a) {2, 3, 4, 5, ...} (b) {3, 4, 5, ...} (c) {1} (d) Null set

10. The solution set for the given inequation $- 8 \leq 2x < 8$, $x \in W$ is :
   (a) {0, 1, 2, 3}
   (b) {–4, –3, –2, –1, 0, 1, 2, 3, 4}
   (c) {–4, –3, –2, –1}
   (d) {–8, –7, –6, –5, ..., 6, 7, 8}

ANSWERS

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

Chapter-5. Quadratic Equations (In One Variable)

Choose the correct option :

1. If $ax^2 + bx + c = 0$ has equal roots, then $c =$
   - (a) $-\dfrac{b}{2a}$
   - (b) $\dfrac{b}{2a}$
   - (c) $-\dfrac{b^2}{4a}$
   - (d) $\dfrac{b^2}{4a}$

2. The values of a for which the quadratic equation $16x^2 + 4ax + 9 = 0$ has real and equal roots are :
   - (a) $6, -\dfrac{1}{6}$
   - (b) $36, -36$
   - (c) $6, -6$
   - (d) $\dfrac{3}{4}, -\dfrac{3}{4}$

3. What would be the value of k for which $x = 3$ is a solution of the quadratic equation :
   $$(k + 2)x^2 - kx + 6 = 0$$
   - (a) $k = -4$
   - (b) $k = 4$
   - (c) $k = -5$
   - (d) none of these

4. What is the value of m, if one root of the quadratic equation $8x^2 + mx + 15 = 0$ is $\dfrac{3}{4}$?
   - (a) 26
   - (b) -26
   - (c) 24
   - (d) none of these

5. If the equation $x^2 + 4x + k = 0$ has real and distinct roots, then :
   - (a) $k < 4$
   - (b) $k > 4$
   - (c) $k \geq 4$
   - (d) $k \leq 4$

6. Find the set of values of k for which the equation $3x^2 - 2x + k = 0$ has real roots.
   - (a) $k \geq \dfrac{1}{3}$
   - (b) $k > \dfrac{1}{3}$
   - (c) $k \leq \dfrac{1}{3}$
   - (d) $k < \dfrac{1}{3}$

7. Which of the following is not a quadratic equation ?
   - (a) $x^2 + 3x - 5 = 0$
   - (b) $x^2 + x^3 + 2 = 0$
   - (c) $3 + x + x^2 = 0$
   - (d) $x^2 - 9 = 0$

8. The roots of the quadratic equation $mx^2 - 7mx + 49 = 0$ are equal.
   - (i) The value(s) of m is/are :
     - (a) 4
     - (b) 2
     - (c) ± 4
     - (d) ± 2
   - (ii) The roots of the equation are :
     - (a) $\dfrac{7}{4}, \dfrac{7}{4}$
     - (b) $\dfrac{4}{7}, \dfrac{4}{7}$
     - (c) $-\dfrac{7}{2}, -\dfrac{7}{2}$
     - (d) $\dfrac{7}{2}, \dfrac{7}{2}$

9. The roots of the equation $5x^2 - 6x + 7 = 0$ are :
   - (a) real and equal
   - (b) real and distinct
   - (c) not real
   - (d) none of these

10. For what value of m, the given quadratic equation $x^2 + (m - 3)x + m = 0$ has real and equal roots.
    - (a) $-9, -1$
    - (b) $9, 1$
    - (c) $-9, 1$
    - (d) none of these

11. The roots of the quadratic equation $x^2 + 2\sqrt{2}\,x - 6 = 0$ are :
    - (a) $-3\sqrt{2}, \sqrt{2}$
    - (b) $3\sqrt{2}, -\sqrt{2}$
    - (c) $3\sqrt{2}, \sqrt{2}$
    - (d) none of these

12. If 2 is a root of the equation $x^2 + ax + 12 = 0$ and the quadratic equation $x^2 + ax + q = 0$ has equal roots, what is the value of q ?
    - (a) 4
    - (b) -16
    - (c) -4
    - (d) 16

13. The discriminant of the quadratic equation $5x^2 - 6x + 7 = 0$ is :
    - (a) 104
    - (b) -104
    - (c) 176
    - (d) none of these

14. Find the least positive value of k for which the quadratic equation $x^2 + kx + 4 = 0$ has real roots.
    - (a) $k = -4$
    - (b) $k = 16$
    - (c) $k = 4$
    - (d) none of these

15. The discriminant of the quadratic equation $\sqrt{3}x^2 + 2\sqrt{2}x - 2\sqrt{3} = 0$ is :
    - (a) 32
    - (b) -32
    - (c) 64
    - (d) -64

Chapter-6. Problems on Quadratic Equations

Choose the correct option :

1. The product of two consecutive integers is 56, then the two integers are :
   - (a) 7, 8 ; –8, –7
   - (b) 4, 14 ; –14, –4
   - (c) 2, 28 ; –28, –2
   - (d) none of these

2. Two natural numbers differ by 1 and their squares have the sum 61, then the two numbers are :
   - (a) 8 and 7
   - (b) 12 and 11
   - (c) 6 and 5
   - (d) none of these

3. The product of two consecutive natural numbers which are multiples of 3 is equal to 810. What would the quadratic equation for the above ?
   - (a) $x^2 - x - 90 = 0$
   - (b) $x^2 + x - 90 = 0$
   - (c) $x^2 + x + 90 = 0$
   - (d) none of these

4. A takes 6 days less than the time taken by B to finish a piece of work. If both A and B together can finish the work is 4 days, find the time taken by B to finish the work.
   - (a) 8 days
   - (b) 10 days
   - (c) 16 days
   - (d) 12 days

5. If the price of a book is reduced by ₹ 5, a person can buy 5 more books for ₹ 300, then what is the original price of the book ?
   - (a) ₹ 25
   - (b) ₹ 30
   - (c) ₹ 20
   - (d) none of these

6. Divide 16 into two parts such that twice the square of the larger part exceeds the square of the smaller part by 164. Frame an equation for the above.
   - (a) $x^2 + 32x - 420 = 0$
   - (b) $x^2 - 32x + 420 = 0$
   - (c) $x^2 - 32x - 420 = 0$
   - (d) none of these

7. The product of Parul's age (in years) five years ago with her age (in years) nine years hence is 15. What is the present age of Parul ?
   - (a) 9 years
   - (b) 6 years
   - (c) 14 years
   - (d) none of these

8. What would be the two numbers if the sum of two numbers is 15 and the sum of their reciprocals is $\dfrac{3}{10}$?
   - (a) 6 and 9
   - (b) 8 and 7
   - (c) 12 and 3
   - (d) 10 and 5

9. The area of a right-angled triangle is 600 cm². If the base of the triangle exceeds the altitude by 10 cm, what are the dimensions of this rectangle ?
   - (a) 40 cm, 30 cm
   - (b) 60 cm, 20 cm
   - (c) 50 cm, 24 cm
   - (d) none of these

10. Find a natural number whose square diminished by 84 is equal to thrice of 8 more than the given number.
    - (a) 24
    - (b) 12
    - (c) 36
    - (d) none of these

ANSWERS

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

Chapter-7. Ratio and Proportion

Choose the correct option :

1. If x, 6, 18, y are in continued proportion, then the values of x and y would be :
   - (a) $x = 54, y = 2$
   - (b) $x = 2, y = 54$
   - (c) $x = 3, y = 36$
   - (d) none of these

2. Find the third proportional to $2\frac{2}{3}$ and 4.

   (a) 6   (b) 8   (c) 10   (d) none of these

3. If a, b, c are in continued proportion, then the value of $\dfrac{(a+b)^2}{(b+c)^2}$ is :

   (a) $\dfrac{c}{a}$ (b) $\dfrac{a}{b}$ (c) $\dfrac{a}{c}$ (d) none of these

4. Find the fourth proportional to $a^2 - b^2$, $a^2 - ab$, $a^3 + b^3$.

   (a) $b(a^2 + ab + b^2)$ (b) $a(a^2 + ab + b^2)$ (c) $b(a^2 - ab + b^2)$ (d) $a(a^2 - ab + b^2)$

5. If $3x - 5y = 2x + y$, then the value of $\dfrac{3x}{5y}$ would be :

   (a) $\dfrac{18}{5}$ (b) $\dfrac{28}{15}$ (c) $\dfrac{8}{5}$ (d) none of these

6. If $\dfrac{a^2 + b^2}{a^2 - b^2} = \dfrac{17}{8}$, then what is the value of $a : b$?

   (a) 3 : 5   (b) 5 : 3   (c) 2 : 3   (d) none of these

7. What is the mean proportional between 6.25 and 0.16 ?

   (a) 0.01   (b) 10   (c) 0.001   (d) 1

8. If x^2, 4 and 9 are in continued proportion, then what is the value of x ?

   (a) $\dfrac{3}{4}$ (b) $\dfrac{2}{3}$ (c) $\dfrac{4}{3}$ (d) none of these

9. If $\dfrac{3x + 5y}{3x - 5y} = \dfrac{7}{3}$, then the value of $\dfrac{x}{y}$ is :

   (a) $\dfrac{6}{25}$ (b) $\dfrac{25}{6}$ (c) $\dfrac{49}{9}$ (d) none of these

10. Find the mean proportional of $\dfrac{1}{12}$ and $\dfrac{1}{75}$.

   (a) $\dfrac{1}{900}$ (b) $\dfrac{1}{300}$ (c) $\dfrac{1}{30}$ (d) none of these

ANSWERS

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

Chapter-8. Factorisation of Polynomials
(Remainder theorem and Factor theorem)

Choose the correct option :

1. If $(2x - 1)$ is a factor of $2x^2 + px - 5$, then the value of p is :
   (a) 10   (b) 9   (c) 8   (d) none of these

2. On dividing $2x^3 + 3x^2 - ax + 5$ by $x - 2$, it leaves a remainder 7, then what is the value of a ?
   (a) – 13   (b) 10   (c) 13   (d) none of these

3. What number should be added to $2x^3 - 3x^2 + x$, so that when the resulting polynomial is divided by $(x - 2)$, the remainder is 3 ?
   (a) –4   (b) 4   (c) 3   (d) –3

4. For what value of k is $2x^3 + kx^2 + 11x + k + 3$ exactly divisible by $(2x - 1)$?
   (a) –7   (b) 7   (c) 12   (d) none of these

5. When the polynomial $2x^3 - ax^2 + (5a - 3)x - 8$ is divided by $x - 2$, the remainder is 14, then the value of a is :
   (a) $a = -2$ (b) $a = 2$ (c) $a = -4$ (d) none of these

6. Find the remainder when $2x^3 + 5x^2 - 9x + 1$ is divided by $(x + 3)$.
   (a) -19 (b) 16 (c) 19 (d) none of these

7. What number should be subtracted from $x^3 + 3x^2 - 8x + 14$, so that on dividing it by $x - 2$, the remainder is 10 ?
   (a) 8 (b) -8 (c) 10 (d) none of these

8. If $(x - 2)$ is a factor of $x^2 + ax + b$ and $a + b = 1$, then the values of a and b are :
   (a) $a = 6, b = -5$ (b) $a = -5, b = 6$ (c) $a = 5, b = 6$ (d) none of these

9. What would be the value of k, if $(x - k)$ is a factor of $x^3 - kx^2 + x + 2$?
   (a) $k = 3$ (b) $k = 2$ (c) $k = -3$ (d) $k = -2$

10. What number should be subtracted from $16x^3 - 8x^2 + 4x + 7$ so that the resulting polynomial has $2x + 1$ as its factor ?
    (a) -1 (b) 4 (c) 1 (d) none of these

11. If on dividing $2x^3 + 6x^2 - (2k - 7)x + 5$ by $x + 3$, the remainder is $k - 1$, then the value of k is :
    (a) 2 (b) -2 (c) 3 (d) -3

12. The polynomial $x^3 + 3x^2 - kx + 4$ when divided by $x - 2$ gives the remainder $k + 3$, then the value of k is :
    (a) 7 (b) 3 (c) 4 (d) 1

13. The polynomials $ax^3 + 3x^2 - 9$ and $2x^3 + 4x + a$ leave the same remainder when divided by $(x + 3)$, then the value of a is :
    (a) 2 (b) 3 (c) -3 (d) none of these

14. If -1 is the remainder when $3x^3 - 4ax + 8$ is divided by $x + 3$, then what is value of a ?
    (a) 4 (b) -6 (c) -4 (d) 6

15. For what value of k is $x + 6$ a factor of the polynomial $x^3 + 5x^2 - 4x + k$?
    (a) -12 (b) 6 (c) 12 (d) -6

ANSWERS

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

Chapter-9. Matrices

Choose the correct option :

1. Given $\begin{bmatrix} 1 & 2 \\ -3 & -4 \end{bmatrix} X = \begin{bmatrix} 4 \\ 12 \end{bmatrix}$. The order of matrix X is :
   (a) 1×2 (b) 2×1 (c) 2×2 (d) none of these

2. Let X be a matrix such that $X \begin{bmatrix} 7 & 0 \\ 5 & -1 \end{bmatrix} = [3 \quad -6]$. State the order of matrix X.
   (a) 2×1 (b) 2×2 (c) 1×2 (d) none of these

3. Find the values of x and y, if $2\begin{bmatrix} 3 & 4 \\ 5 & x \end{bmatrix} + \begin{bmatrix} 1 & y \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 7 & 0 \\ 10 & 5 \end{bmatrix}$.
   (a) $x = 2, y = -8$ (b) $x = -2, y = 8$ (c) $x = 2, y = 8$ (d) none of these

4. If $B = \begin{bmatrix} 1 & 2 \\ -1 & 5 \end{bmatrix}$, find matrix A such that $2A + B = \begin{bmatrix} 5 & 0 \\ -3 & 3 \end{bmatrix}$.
   (a) $\begin{bmatrix} -2 & -1 \\ -1 & -1 \end{bmatrix}$ (b) $\begin{bmatrix} 2 & 1 \\ -1 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$ (d) $\begin{bmatrix} 2 & -1 \\ -1 & -1 \end{bmatrix}$

5. If $\begin{bmatrix} 4 & 3x \\ x & -2 \end{bmatrix} \begin{bmatrix} 5 \\ 1 \end{bmatrix} = \begin{bmatrix} y \\ 8 \end{bmatrix}$, what would be the values of x and y ?

    (a) $x = -2, y = 26$ (b) $x = -2, y = -26$ (c) $x = 2, y = 26$ (d) none of these

6. If I is a unit matrix of order 2×2, what is the value of matrix X given that $X - 2I = \begin{bmatrix} -1 & 0 \\ 4 & 1 \end{bmatrix}$.

    (a) $\begin{bmatrix} 1 & 0 \\ 12 & -5 \end{bmatrix}$ (b) $\begin{bmatrix} -1 & 0 \\ 12 & 5 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 0 \\ -12 & -5 \end{bmatrix}$ (d) none of these

7. The order of matrix A is 2×3 and that of B is 3×1.

    (a) AB is possible but BA is not possible   (b) BA is possible but AB is not possible

    (c) AB as well as BA are not possible   (d) AB as well as BA are possible

8. If $\begin{bmatrix} 1 & 4 \\ -2 & 3 \end{bmatrix} + 2X = 3 \begin{bmatrix} 3 & 2 \\ 0 & -3 \end{bmatrix}$, find the matrix X.

    (a) $\begin{bmatrix} 4 & -1 \\ -1 & 6 \end{bmatrix}$ (b) $\begin{bmatrix} 4 & 1 \\ 1 & 6 \end{bmatrix}$ (c) $\begin{bmatrix} 4 & 1 \\ 1 & -6 \end{bmatrix}$ (d) none of these

9. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, the matrix A^2 would be :

    (a) $\begin{bmatrix} 9 & 1 \\ 1 & 4 \end{bmatrix}$ (b) $\begin{bmatrix} 8 & 5 \\ -5 & 3 \end{bmatrix}$ (c) $\begin{bmatrix} -8 & -5 \\ 5 & 3 \end{bmatrix}$ (d) none of these

10. Let $M = \begin{bmatrix} 1 & -2 \end{bmatrix}$, $N = \begin{bmatrix} 2 & 1 \\ -1 & 2 \end{bmatrix}$. State the order of product MN :

    (a) 1×2 (b) 2×1 (c) 2×2 (d) none of these

11. The order of a column matrix is of the form :

    (a) $m \times 1$ (b) $1 \times m$ (c) $m \times 2$ (d) none of these

12. If $P = \begin{bmatrix} 4 & -2 \\ 5 & 7 \end{bmatrix}$, $Q = \begin{bmatrix} 3 & 5 \\ -4 & -2 \end{bmatrix}$, and $R = \begin{bmatrix} 1 & 3 \\ -2 & 4 \end{bmatrix}$, then the value of A + B − C is :

    (a) $\begin{bmatrix} 6 & 1 \\ 3 & 0 \end{bmatrix}$ (b) $\begin{bmatrix} 6 & 0 \\ 3 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} 6 & 3 \\ 0 & 1 \end{bmatrix}$ (d) $\begin{bmatrix} 6 & 6 \\ 3 & 1 \end{bmatrix}$

13. On simplifying $\sin A \begin{bmatrix} \sin A & -\cos A \\ \cos A & \sin A \end{bmatrix} + \cos A \begin{bmatrix} \cos A & \sin A \\ -\sin A & \cos A \end{bmatrix}$, the value is :

    (a) $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ (b) $\begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (d) none of these

14. If matrix $M = \begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$ and $M^2 = xM$, then what is the value of x ?

    (a) 4   (b) 6   (c) −4   (d) none of these

15. If $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$, what would be the value of $a + b + c + d$?

    (a) 0   (b) 2   (c) 1   (d) −2

ANSWERS

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

Chapter-10. Arithmetic and Geometric Progressions

Choose the correct option :

1. The sum of first 16 terms of the A.P. 10, 6, 2, – 2, ... is :
   (a) –320   (b) 320   (c) –350   (d) –300

2. If the first term of an A.P. is 1 and the common difference is 2, then the sum of first 26 terms is :
   (a) 484   (b) 576   (c) 676   (d) 625

3. The sum of first 25 terms of an A.P. whose nth term is $2 - 3n$, is :
   (a) –975   (b) –925   (c) –1025   (d) –855

4. The sum of 25 terms of the A.P. $\dfrac{-2}{3}, \dfrac{-2}{3}, \dfrac{-2}{3}, \ldots$ is :
   (a) 0   (b) $\dfrac{-2}{3}$ (c) $\dfrac{-50}{3}$ (d) –50

5. The 12th term from the end of the A.P. –2, –4, –6, –8, ..., –100 is :
   (a) –78   (b) –82   (c) –80   (d) –68

6. How many terms are there in the A.P. 9, 13, 17, 21, ..., 97 ?
   (a) 24   (b) 23   (c) 32   (d) none of these

7. Find the sum of the following numbers given in A.P.
   –11, –7, –3, 1, ... to 12 terms
   (a) 148   (b) 232   (c) 136   (d) 132

8. The 4th and 6th terms of an A.P. are 8 and 14 respectively, what is the sum of first 20 terms ?
   (a) 550   (b) 750   (c) 600   (d) none of these

9. If the nth term of an A.P. is $T_n = 6n + 2$, then its common difference is :
   (a) 4   (b) 2   (c) 6   (d) 8

10. If $(k - 3)$, $(2k + 1)$ and $(4k + 3)$ are three consecutive terms of an A.P., then the value of k is :
    (a) 4   (b) 6   (c) 8   (d) 2

11. The 3rd term is 5 and 7th is 9, then the first four terms of the A.P. are :
    (a) 7, 8, 9, 10   (b) 3, 4, 5, 6   (c) 12, 13, 14, 15   (d) none of these

12. For the A.P. 11, 8, 5, 2, –1, –4, ... , (–61), the middle term would be :
    (a) –25   (b) –36   (c) –49   (d) none of these

13. The eighth term of the G.P. $\dfrac{3}{4}, 1\dfrac{1}{2}, 3, \ldots$ is :
    (a) 69   (b) 54   (c) 96   (d) 49

14. If $k, k + 3, k + 9$ are three consecutive terms of a G.P., then the value of k is :
    (a) 3   (b) 1   (c) 9   (d) –1

15. If $a, 2(a + 1), 3(a + 1)$ are three consecutive terms of a G.P., then the value of a is :
    (a) –1   (b) –4   (c) 1   (d) 4

16. The fourth and the seventh terms of a G.P. are 16 and 128 respectively, then the first term and the common ratio of the G.P. is :
    (a) $a = 4, r = 4$ (b) $a = -2, r = -2$ (c) $a = 6, r = 6$ (d) $a = 2, r = 2$

17. The sum of first nine terms of the G.P. 3, 6, 12, 24, ... is :
    (a) 1523   (b) 1543   (c) 1533   (d) none of these

18. The 6th term from the end of the G.P. 16, 8, 4, 2, ..., $\dfrac{1}{512}$ is :
    (a) $\dfrac{1}{16}$ (b) $\dfrac{1}{24}$ (c) $\dfrac{1}{32}$ (d) none of these

9

19. Find how many terms of the G.P. $\dfrac{2}{9} - \dfrac{1}{3} + \dfrac{1}{2} - ...$ must be added to get the sum equal to $\dfrac{55}{72}$?

   (a) 9   (b) 7   (c) 11   (d) 5

20. Find which term of the G.P. 3 – 6 + 12 – 24 + ... is – 384 ?

   (a) 8   (b) 10   (c) 12   (d) none of these

ANSWERS

1. (a)	**2.** (c)	**3.** (b)	**4.** (c)	**5.** (a)	**6.** (b)	**7.** (d)
8. (a)	**9.** (c)	**10.** (d)	**11.** (b)	**12.** (a)	**13.** (c)	**14.** (a)
15. (b)	**16.** (d)	**17.** (c)	**18.** (a)	**19.** (d)	**20.** (a)	

UNIT-3 CO-ORDINATE GEOMETRY

Chapter-11. Reflection

Choose the correct option :

1. The reflection of the point P(–5, –2) in the origin is :

   (a) P'(5, –2)   (b) P'(–5, 2)   (c) P'(5, 2)   (d) P'(–2, –5)

2. The reflection of the point Q(–6, –2) in the y-axis is :

   (a) Q'(6, 2)   (b) Q'(6, –2)   (c) Q'(–6, 2)   (d) none of these

3. The reflection of the point R(–5, 4) in the x-axis is :

   (a) R'(–5, –4)   (b) R'(5, 4)   (c) R'(5, –4)   (d) none of these

4. Find the image of P(7, –8) under reflection in the line $y = 0$.

   (a) P'(–7, –8)   (b) P'(–7, 8)   (c) P'(7, 0)   (d) P'(7, 8)

5. Find the image of Q(–9, 5) under reflection in the line $x = 0$.

   (a) Q'(9, 5)   (b) Q'(–9, –5)   (c) Q'(9, –5)   (d) none of these

6. Points (0, –6) and (0, 2) are invariant points on reflection in line L, then line L is :

   (a) x-axis   (b) y-axis   (c) origin   (d) none of these

7. Points (4, 0) and (–7, 0) are invariant points under reflection in line L, then line L is :

   (a) y-axis   (b) origin   (c) x-axis   (d) none of these

8. The reflection of the point P(–3, 2) in the line $y = 2$ is :

   (a) (3, – 2)   (b) (3, 2)   (c) (–3, –2)   (d) (–3, 2)

9. The reflection of the point P(2, 4) in the line $x = 1$ is :

   (a) (–2, –4)   (b) (0, 4)   (c) (4, 0)   (d) none of these

10. The point P(a, b) is first reflected in the origin and then reflected in the y-axis to P'. If P' has co-ordinates (3, –4), then the values of a and b are :

   (a) $a = –3, b = –4$ (b) $a = –3, b = 4$ (c) $a = 3, b = 4$ (d) none of these

11. Point P(0, 7) is invariant when reflected in the line :

   (a) $x = 0$ (b) $y = 0$ (c) $x = 5$ (d) $y = 5$

12. Point P(a, b) is reflected in the x-axis to P'(5, –2), what would be the values of a and b ?

   (a) $a = –5, b = –2$ (b) $a = –5, b = 2$ (c) $a = 5, b = 2$ (d) none of these

13. The point P(a, b) is first reflected in the x-axis and then reflected in the origin to P'. If P' has co-ordinates (–8, 5), what are the values of x and y ?

   (a) $x = 8, y = 5$ (b) $x = –8, y = –5$ (c) $x = 8, y = –5$ (d) none of these

14. A point P is reflected in the origin. The co-ordinates of its image are (–2, 7), what are the co-ordinates of the image of point P under reflection in the x-axis ?

   (a) (–2, –7)   (b) (2, 7)   (c) (–2, 7)   (d) (2, –7)

15. The point (–3, 0) on reflection in a line is mapped as (3, 0) and the point (–3, –8) on reflection in the same line is mapped as (3, –8), what is the line of reflection ?

(a) x-axis   (b) origin   (c) y-axis   (d) none of these

ANSWERS

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

Chapter-12. Section and Mid-Point Formula

Choose the correct option :

1. If the point R(–1, 2) divides internally the line segment joining P(2, 5) and Q in the ratio 3 : 4, what would be the co-ordinates of Q ?

(a) (5, 2)   (b) (5, –2)   (c) (–5, –2)   (d) (–5, 2)

2. The point which divides the line segment joining the points P(5, 6) and Q(2, – 3) in the ratio 2 : 1 internally lies on :

(a) positive direction of x-axis   (b) negative direction of x-axis
(c) positive direction of y-axis   (d) negative direction of y-axis

3. The point which divides the line segment joining the points A(7, – 6) and B(3, 4) in the ratio 1 : 2 internally lies in the :

(a) first quadrant   (b) second quadrant   (c) third quadrant   (d) fourth quadrant

4. In what ratio does the point P(2, –5) divide the join of A(–3, 5) and B(4, –9) ?

(a) 2 : 5   (b) 5 : 2   (c) 3 : 2   (d) none of these

5. A(–4, 4), B(x, –1) and C(6, y) are the vertices of ΔABC. If the centroid of this ΔABC is at the origin, then the values of x and y are :

(a) $x = -2, y = -3$ (b) $x = 2, y = 3$ (c) $x = -2, y = 3$ (d) $x = 2, y = -3$

6. The mid-point of the line segment joining the points P(2k, 4) and Q(–2, 2a) is R(1, 2k + 1), then the values of k and a are :

(a) –2, 3   (b) –2, –3   (c) 2, –3   (d) 2, 3

7. In what ratio does the y-axis divide the line segment joining the points P(–4, 5) and Q(3, –7) ?

(a) 4 : 3   (b) 3 : 4   (c) 3 : 1   (d) none of these

8. If R(1, –2) is a point on the line segment P(3, –6) and Q(a, b) such that PR : RQ is equal to 2 : 3, then the co-ordinates of Q are :

(a) (2, 4)   (b) (–2, –4)   (c) (–2, 4)   (d) none of these

9. In what ratio is the join of A(4, 3) and B(2, –6) divided by the x-axis ?

(a) 1 : 2   (b) 2 : 1   (c) 2 : 3   (d) none of these

10. The mid-point of the line segment joining P(4a, 2b – 3) and Q(–4, 3b) is R(2, –2a), then the values of a and b are :

(a) $a = -2, b = 1$ (b) $a = 2, b = -1$ (c) $a = 2, b = 1$ (d) none of these

11. The mid-point of the line segment PQ as shown in the figure is (–3, 5), what would be the co-ordinates of P and Q ?

(a) P(6, 0), Q(0, –10)
(b) P(0, –6), Q(10, 0)
(c) P(–6, 0), Q(0, 10)
(d) none of these

11
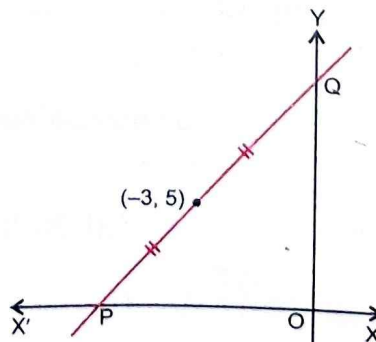
12. If the points A(–2, –1), B(1, 0), C(a, 3) and D(1, b) form a parallelogram, what would be the values of a and b ?
    (a) a = 2, b = 4   (b) a = –4, b = –2   (c) a = 4, b = 2   (d) none of these

13. A line intersects the y-axis and x-axis at points P and Q respectively. If (2, –5) is the mid-point of PQ, then co-ordinates of P and Q respectively are :
    (a) (0, –5) and (2, 0)   (b) (0, 10) and (–4, 0)
    (c) (0, 4) and (–10, 0)   (d) (0, –10) and (4, 0)

14. In what ratio the point P(–6, a) divides the join of A(–3, 1) and B(–8, 9) ?
    (a) 2 : 3   (b) 3 : 2   (c) 2 : 5   (d) none of these

15. P(3, 2) and Q(–2, 1) are two vertices of a triangle PQR whose centroid G has the co-ordinates $\left(\frac{5}{3}, -\frac{1}{3}\right)$.

    What would be the co-ordinates of the third vertex R of the triangle ?
    (a) (4, –4)   (b) (4, 4)   (c) (–4, 4)   (d) none of these

ANSWERS

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

Chapter-13. Equations of a Straight Line

Choose the correct option :

1. The lines represented by 4x + 3y = 9 and kx – 6y + 3 = 0 are parallel. The value of k is :
   (a) $-\frac{2}{3}$ (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) none of these

2. What would be the value of k, if the lines represented by 2x + 3y – 7 = 0 and 4y – kx – 12 = 0 are perpendicular to each other ?
   (a) –6   (b) $\frac{1}{6}$ (c) 6   (d) none of these

3. The equation of a line is given by $2x - 2\sqrt{3}y + \sqrt{3} = 0$. What would be its inclination with the positive direction of the x-axis ?
   (a) 30°   (b) 45°   (c) 60°   (d) none of these

4. The line through A(3, a) and B(2, 7) is parallel to the line through C(–1, 4) and D(0, 6), the value of a would be :
   (a) –9   (b) 6   (c) –6   (d) 9

5. What is the inclination of the line $\sqrt{3}x - y - 1 = 0$?
   (a) 30°   (b) 60°   (c) 45°   (d) none of these

6. If the points A(–2, 3), B(3, 4) and C(a, 5) are collinear, what would be the value of a ?
   (a) 8   (b) –8   (c) 6   (d) none of these

7. The slope of a line perpendicular to the line passing through the points (2, 5) and (–3, 6) is :
   (a) $-\frac{1}{5}$ (b) $\frac{1}{5}$ (c) –5   (d) 5

8. The equation of the line passing through the origin and whose inclination is 60° is :
   (a) y = x   (b) x = y   (c) $y = \sqrt{3}x$ (d) $x = \sqrt{3}y$

9. If the slope of the line P(6, a) and Q(1–3a, 3) is $\frac{1}{2}$, what would be value of a ?
   (a) 11   (b) –11   (c) $\frac{1}{11}$ (d) none of these

10. The equation of a straight line whose y-intercept is 4 units and is perpendicular to the line joining P(2, –3) and Q(4, 2) is :

    (a) $2x + 5y – 20 = 0$ (b) $2x + 5y + 20 = 0$ (c) $2x – 5y + 20 = 0$ (d) none of these

11. The inclination of a line parallel to x-axis or the x-axis itself is :

    (a) 90°   (b) not possible   (c) 0°   (d) none of these

12. What is the equation of a line parallel to the x-axis and located at a distance of 5 units below the x-axis ?

    (a) $x = 5$ (b) $x = -5$ (c) $y = 5$ (d) $y = -5$

13. What is the equation of a line parallel to the y-axis and passing through the point (–7, 5) ?

    (a) $x + 7 = 0$ (b) $x – 7 = 0$ (c) $y + 7 = 0$ (d) $y – 7 = 0$

14. If the straight lines $x – 2y = 0$ and $kx + y = 1$ intersect at the point $P\left(1, \dfrac{1}{2}\right)$, then what is value of k ?

    (a) 1   (b) 2   (c) $\dfrac{1}{2}$ (d) $-\dfrac{1}{2}$

15. The equation of a straight line is given by $3x – 4y + 12 = 0$. It meets the x-axis at point A and the y-axis at point B, what would be the co-ordinates of points A and B ?

    (a) A(4, 0) ; B(0, 3)   (b) A(–4, 0) ; B(0, 3)

    (c) A(–4, 0) ; B(0, –3)   (d) none of these

ANSWERS

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

UNIT- 4 GEOMETRY

Chapter-14. Similarity

Choose the correct option :

1. In the given figure, DE || AB, then the value of x will be :

    (a) 1   (b) 4

    (c) 3   (d) 2
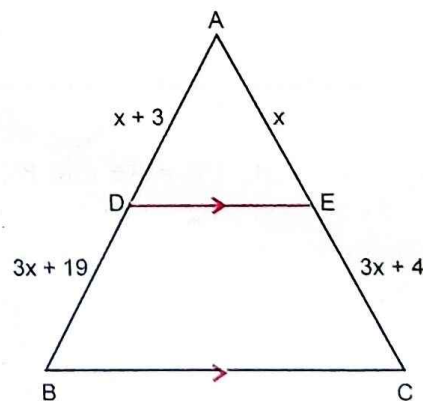
2. The length of AB, from the given figure is :

    (a) 8 cm   (b) 6 cm

    (c) 4 cm   (d) 10 cm
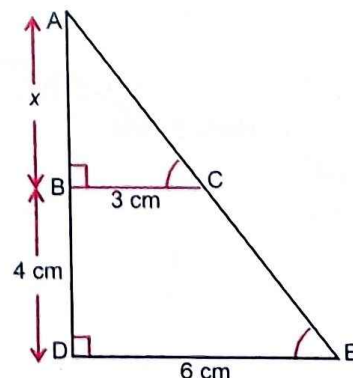
3. In $\triangle ABC$, AD is the bisector of $\angle A$, if BC = 10 cm, BD = 6 cm and AC = 6 cm. Find the length of AB.
   (a) 15 cm
   (b) 12 cm
   (c) 8 cm
   (d) 9 cm
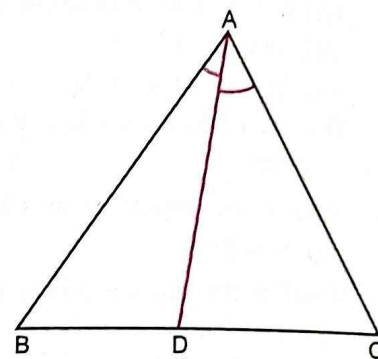
4. In the given figure, $\triangle APQ$ is similar to $\triangle ACB$. Given AP = 8 cm, BP = 22 cm, AQ = 12 cm, QC = 8 cm and PQ = 14 cm, what is the length of BC ?
   (a) 35 cm
   (b) 28 cm
   (c) 32 cm
   (d) none of these
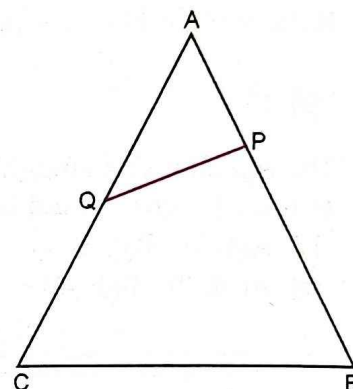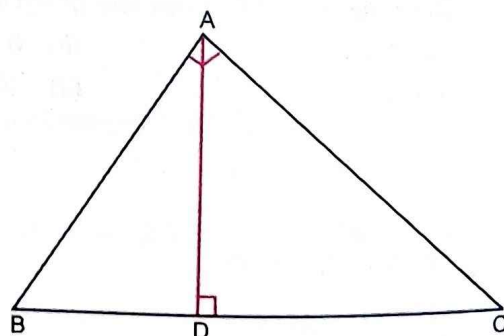

5. In the given figure, CA || BD, AC = 6 cm, AE = 3 cm, EB = 4 cm, ED = 8 cm, what would be the values of CE and BD ? ($\triangle$'s being similar)
   (a) 6 cm, 8 cm
   (b) 8 cm, 10 cm
   (c) 8 cm, 12 cm
   (d) none of these
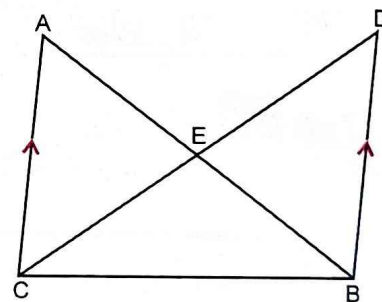
6. Given AB || QR, PB = 3.6 cm, BR = 2.4 cm and PQ = 5 cm, then length of PA would be :
   (a) 4 cm
   (b) 3.6 cm
   (c) 2 cm
   (d) 3 cm
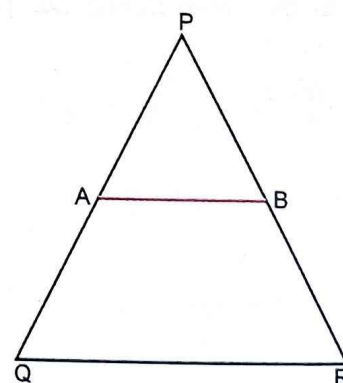
7. Given $\angle BAC = 90°$, AD $\perp$ BC, BD = 16 cm and CD = 25 cm, then AD is :
   (a) 7 cm
   (b) 7.5 cm
   (c) 8 cm
   (d) 20 cm

8. Two geometric figures are said to be similar, if they have :
   (a) same shape and size
   (b) same shape but different size
   (c) different shape but same size
   (d) different shape and size

9. In $\triangle ABC$ and $\triangle DEF$, if $\angle A = \angle E$ and $\angle B = \angle F$, then $\dfrac{AB}{AC}$ is equal to :

   (a) $\dfrac{DE}{DF}$
   (b) $\dfrac{ED}{EF}$
   (c) $\dfrac{EF}{ED}$
   (d) $\dfrac{EF}{DF}$

10. In the given diagram, the $\triangle ABC$ is similar to $\triangle DEF$ by the axiom :
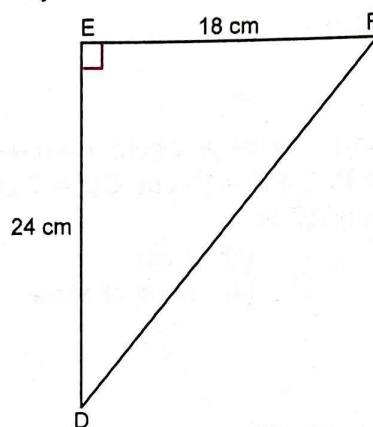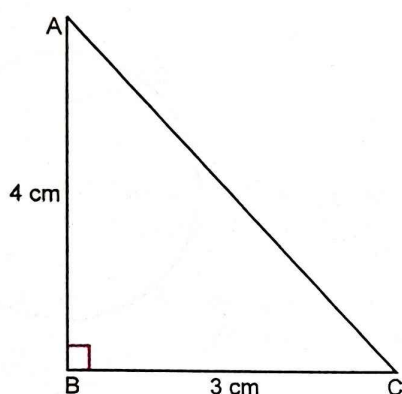
   (a) SSS
   (b) SAS
   (c) AAA
   (d) RHS

ANSWERS

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

Chapter-15. Locus – No MCQs

Chapter-16. Circles

Choose the correct option :

1. In the given figure, A, B, C and D are points on the circle with centre O. Given $\angle ABC = 62°$, what is the value of $\angle CAB$?
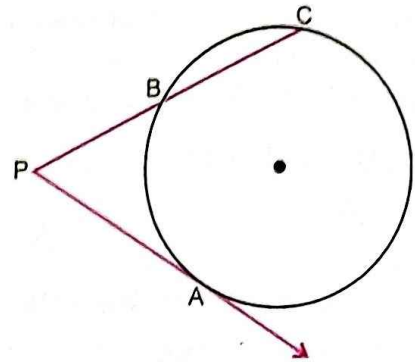   (a) 62°
   (b) 28°
   (c) 38°
   (d) none of these
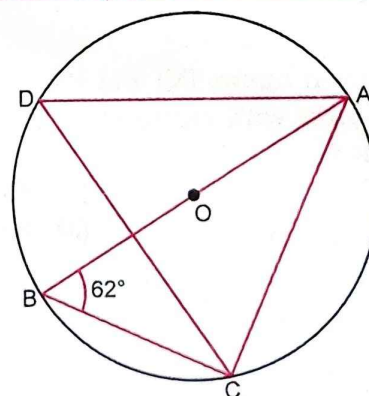
2. In the given figure, AC is a diameter of the circle and $\angle ADB = 35°$. The degree measure of x is :
   (a) 65°
   (b) 45°
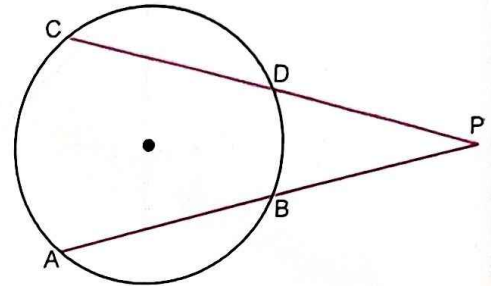   (c) 55°
   (d) none of these

15
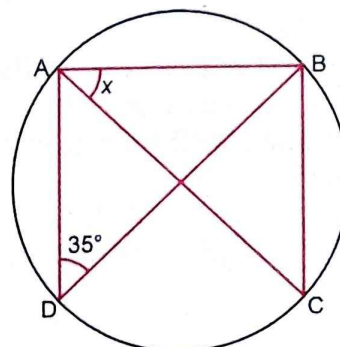
3. In the given figure, if PA = 20 cm, PB = 16 cm, then BC is :
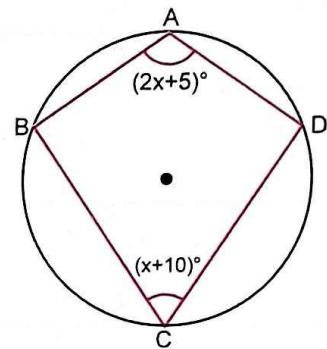   (a) 4.5 cm   (b) 6 cm
   (c) 8 cm   (d) 9 cm

4. Two chords AB and CD of a circle intersect externally at a point P. If PC = 15 cm, CD = 7 cm and AP = 12 cm, then AB is :
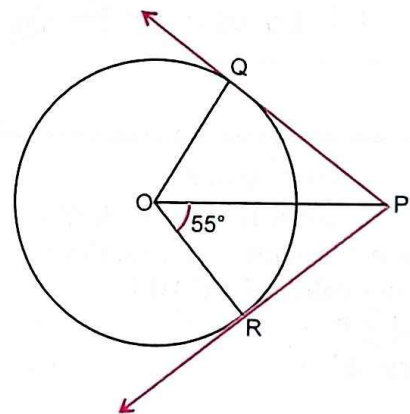   (a) 2 cm   (b) 4 cm
   (c) 6 cm   (d) none of these

5. ABCD is a cyclic quadrilateral. If $\angle BAD = (2x + 5)°$ and $\angle BCD = (x + 10)°$, then x is equal to :
   (a) 65°   (b) 45°
   (c) 55°   (d) 5°
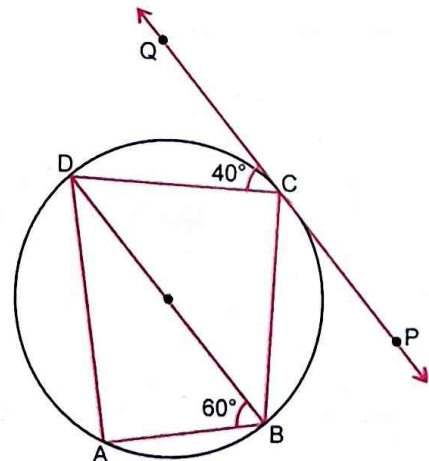
6. In the given figure, PQ and PR are tangents from P to a circle with centre O. If $\angle POR = 55°$, then $\angle QPR$ is :
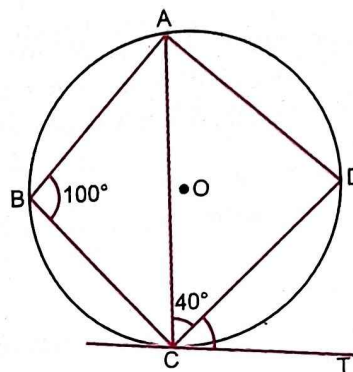   (a) 35°   (b) 55°
   (c) 70°   (d) 80°

7. In the given figure, ABCD is a cyclic quadrilateral and PQ is a tangent to the circle at C. If BD is a diameter, $\angle DCQ = 40°$ and $\angle ABD = 60°$, then $\angle BCP$ and $\angle ADB$ are equal to :
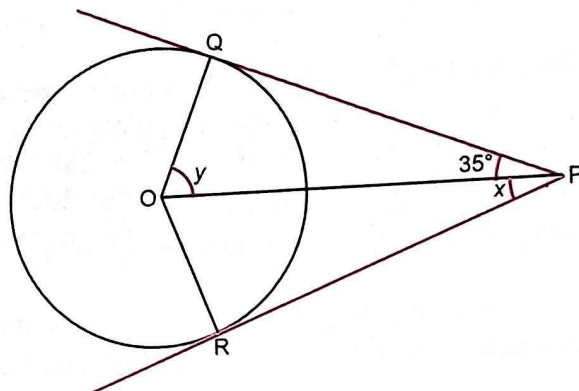   (a) 50°, 30°   (b) 60°, 20°
   (c) 25°, 40°   (d) 100°, 30°

8. In the given figure with centre O, $\angle ABC = 100°$, $\angle ACD = 40°$ and CT is a tangent to the circle at C. What is the value of $\angle DCT$?
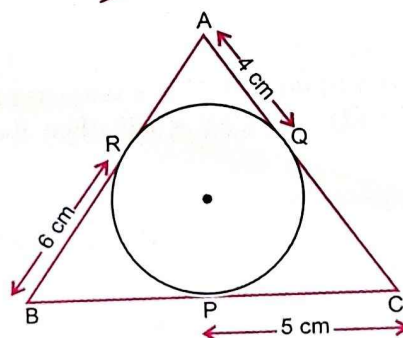   (a) 40°
   (b) 100°
   (c) 80°
   (d) 60°

9. In the given figure, PQ and PR are tangents drawn from P to a circle with centre O. If $\angle OPQ = 35°$, then :
   (a) $x = 30°, y = 60°$
   (b) $x = 35°, y = 55°$
   (c) $x = 40°, y = 50°$
   (d) $x = 45°, y = 45°$

10. In the given figure, the perimeter of $\triangle ABC$ is :
    (a) 30 cm
    (b) 60 cm
    (c) 45 cm
    (d) 15 cm

11. In the given figure, $\angle ABC = 40°$ and AD is a diameter of the circle, what is the value of $\angle DAC$?
    (a) 60°
    (b) 25°
    (c) 50°
    (d) none of these
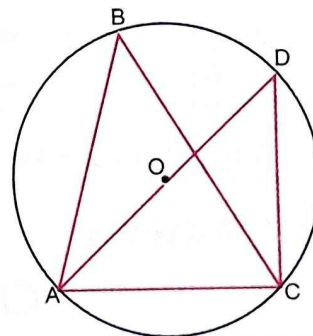
12. In the given figure, AB is a diameter of a circle with centre O and AT is a tangent. If $\angle AOQ = 58°$, then the measure of $\angle ATQ$ is :
    (a) 29°
    (b) 61°
    (c) 58°
    (d) none of these

17

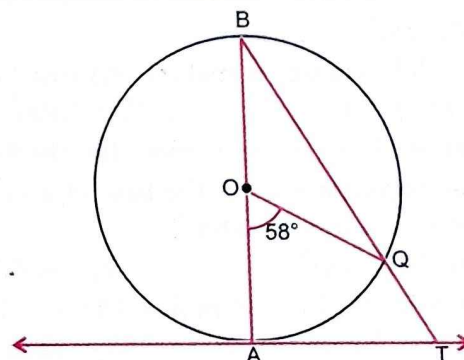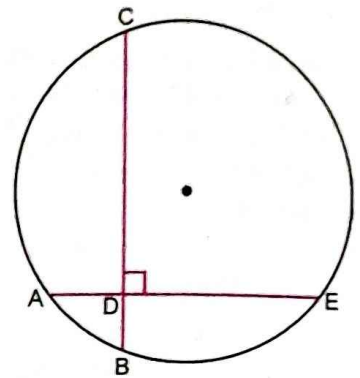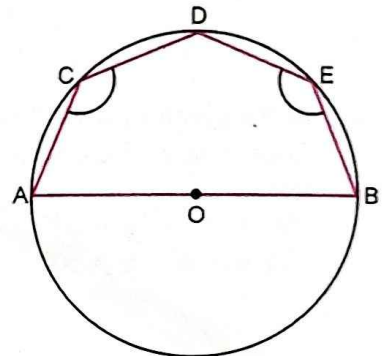13. In the given figure, AE and BC intersect each other at a point D. If ∠CDE = 90°, AB = 5 cm, BD = 4 cm and CD = 9 cm, then what is the value of DE ?
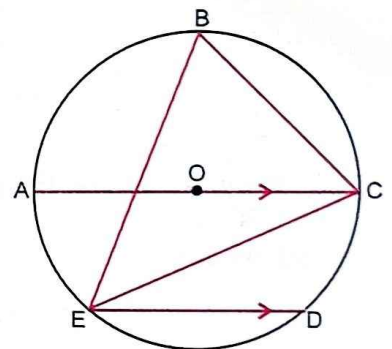   (a) 8 cm
   (b) 14 cm
   (c) 10 cm
   (d) 12 cm

14. In the given figure, AB is a diameter of the circle and C, D, E are any three points on the semi-circle. What is the value of ∠ACD + ∠BED ?
   (a) 270°
   (b) 180°
   (c) 240°
   (d) none of these

15. In the given figure, AOC is a diameter and AC is parallel to ED. If ∠CBE = 64°, then the value of ∠DEC is :
   (a) 32°
   (b) 26°
   (c) 64°
   (d) none of these

ANSWERS

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

Chapter-17. Constructions – No MCQs

UNIT- 5 MENSURATION

Chapter-18. Mensuration

Choose the correct option :

1. A solid cylinder is melted and cast into a cone of same radius. The heights of the cone and cylinder are in the ratio :
   (a) 9 : 1
   (b) 1 : 9
   (c) 3 : 1
   (d) 1 : 3

2. The circumference of the base of a cylindrical vessel is 132 cm and its height is 25 cm, then what is the volume of the cylinder ?
   (a) 34560 cm³
   (b) 34650 cm³
   (c) 34750 cm³
   (d) none of these

3. For a hemisphere of radius 3.5 cm, what would be its total surface area ?
   (a) 115.5 cm²
   (b) 120.5 cm²
   (c) 130.5 cm²
   (d) none of these

4. The volume of two spheres are in the ratio 64 : 27. The ratio of their surface areas is :
   (a) 3 : 4
   (b) 4 : 3
   (c) 9 : 16
   (d) 16 : 9

5. A solid metallic spherical ball of diameter 6 cm is melted and recast into a cone with diameter of the base as 12 cm. The height of the cone is :
   (a) 2 cm
   (b) 3 cm
   (c) 4 cm
   (d) 6 cm

6. If two solid hemispheres of same base radius r are joined together along their bases, then curved surface area of this new solid is :
   (a) $6\pi r^2$
   (b) $3\pi r^2$
   (c) $4\pi r^2$
   (d) none of these

7. During conversion of a solid from one shape to another, the volume of new shape will :
   (a) increase
   (b) decrease
   (c) remains unaltered
   (d) be doubled

8. Twelve solid spheres of same size are made by melting a solid metallic cylinder of base diameter 2 cm and height 16 cm, then the diameter of each sphere is :
   (a) 2 cm
   (b) 4 cm
   (c) 6 cm
   (d) none of these

9. A right circular cylinder and a right circular cone have the same radius and the same volume. The ratio of the height of the cylinder to that of the cone is :
   (a) 3 : 5
   (b) 2 : 5
   (c) 3 : 1
   (d) 1 : 3

10. A solid cone of radius 5 cm and height 8 cm is melted and made into small spheres of radius 0.5 cm, then how many spheres are formed ?
    (a) 40
    (b) 400
    (c) 800
    (d) none of these

11. The height h of a cylinder equals the circumference of the cylinder. In terms of h, what is the volume of the cylinder ?
    (a) $\dfrac{h^2}{2\pi}$
    (b) $\dfrac{h^3}{2}$
    (c) $\dfrac{h^3}{4\pi}$
    (d) πh^3

12. Two right circular cones A and B are made. A having three times the radius of B and B having half the volume of A, what would be the ratio between the heights of A and B ?
    (a) 2 : 9
    (b) 1 : 9
    (c) 3 : 7
    (d) none of these

13. A cone and a hemisphere have the same base and the same height. What is the ratio between their volumes ?
    (a) 2 : 1
    (b) 1 : 2
    (c) 2 : 3
    (d) none of these

14. The diameter of a garden roller is 1.4 m and it is 2 m long. How much area will it cover in 50 revolutions ?
    (a) 540 m²
    (b) 640 m²
    (c) 440 m²
    (d) none of these

15. The ratio of lateral surface area to the total surface area of a cylinder with base diameter 1.6 m and height 20 cm is :
    (a) 1 : 7
    (b) 1 : 5
    (c) 7 : 1
    (d) 5 : 1

ANSWERS

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

UNIT- 6 TRIGONOMETRY

Chapter-19. Trigonometric Identities

Choose the correct option :

1. If $\dfrac{\sin x}{1+\cos x} + \dfrac{\sin x}{1-\cos x} = m$, then :
   (a) $m = 2\operatorname{cosec} x$
   (b) $m = 2\sin x$
   (c) $m = 2\cos x$
   (d) $m = 2\sec x$

2. If cosec A – cot A = k, then the value of cosec A + cot A is :

(a) $1 - \dfrac{1}{k}$ (b) $1 - k$ (c) $1 + k$ (d) $\dfrac{1}{k}$

3. The expression $\dfrac{1 + \tan^2\theta}{1 - \tan^2\theta}$ is equal to :

(a) -1 (b) $\tan^2\theta$ (c) $\cot^2\theta$ (d) $\sec^2\theta$

4. On solving $(1 + \tan^2 A)(1 + \sin A)(1 - \sin A)$, we get :

(a) -1 (b) $\cos A$ (c) 1 (d) none of these

5. If $A = 3\sec^2\theta - 1$ and $B = 3\tan^2\theta - 2$, then A – B equals :

(a) 4 (b) 3 (c) 2 (d) 1

6. $\dfrac{\sin\theta}{1 + \cos\theta}$ is equal to :

(a) $\dfrac{1 + \cos\theta}{\sin\theta}$ (b) $\dfrac{1 - \cos\theta}{\cos\theta}$ (c) $\dfrac{1 - \cos\theta}{\sin\theta}$ (d) $\dfrac{1 - \sin\theta}{\cos\theta}$

7. Which of the following is true for all values of θ $(0 < \theta < 90°)$?

(a) $\cos^2\theta - \sin^2\theta = 1$ (b) $\cosec^2\theta - \sec^2\theta = 1$

(c) $\sec^2\theta - \tan^2\theta = 1$ (d) $\cot^2\theta - \tan^2\theta = 1$

8. On simplifying $\left(\dfrac{1 - \tan\theta}{1 - \cot\theta}\right)^2$, the value of the expression is :

(a) $\tan\theta$ (b) $\tan^2\theta$ (c) $-\tan\theta$ (d) none of these

9. $\dfrac{\tan\theta}{\sec\theta - 1} + \dfrac{\tan\theta}{\sec\theta + 1}$ is equal to :

(a) $2\cosec\theta$ (b) $2\sec\theta$ (c) $2\tan\theta$ (d) none of these

10. On simplifying the expression $(\sec^2\theta - 1)(1 - \cosec^2\theta)$, the value is :

(a) -1 (b) 1 (c) 0 (d) 2

11. The value of $\cot^2\theta - \dfrac{1}{\sin^2\theta}$ is :

(a) 1 (b) 2 (c) -1 (d) none of these

12. If $1 + 2\sin^2 A \cos^2 A = \sin^2 A + \cos^2 A + 4p \sin^2 A \cos^2 A$, then the value of p is :

(a) $p = -\dfrac{1}{2}$ (b) $p = -1$ (c) $p = \dfrac{1}{2}$ (d) $p = 1$

13. On simplifying the expression $\dfrac{\tan^3\theta - 1}{\tan\theta - 1}$, the value is :

(a) $\sec^2\theta + \tan\theta$ (b) $\sec^2\theta - \tan\theta$ (c) $\sec\theta + \tan\theta$ (d) none of these

14. $1 - \dfrac{\cos^2 A}{1 + \sin A}$ is equal to :

(a) $\cos A$ (b) $\sin A$ (c) $\tan A$ (d) $\sec A$

15. On simplifying the expression $\dfrac{(1 + \tan^2 A)\cot A}{\cosec^2 A}$, the value is :

(a) $\sin A$ (b) $\cot A$ (c) $\sec A$ (d) $\tan A$
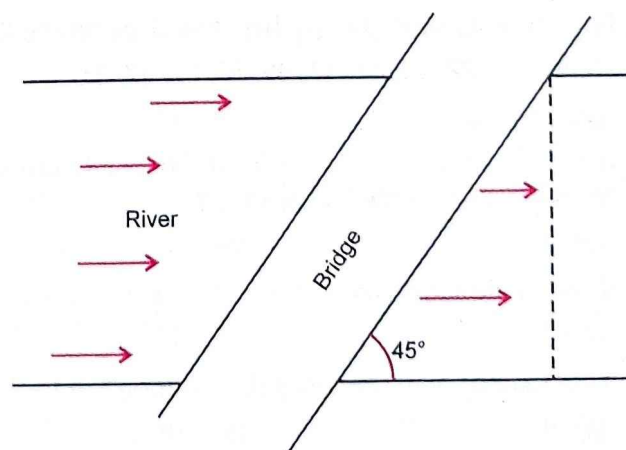
ANSWERS

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

Chapter-21. Heights and Distances

Choose the correct option :

1. The angle of elevation of the top of a tower from a distance of 100 m from its food is 30°. The height of the tower is :

   (a) $100\sqrt{3}$ m (b) $\dfrac{100}{\sqrt{3}}$ m (c) $50\sqrt{3}$ m (d) $\dfrac{200}{\sqrt{3}}$ m

2. The angle of depression of a truck parked on the road from the top of a 150 metres high building is 30°. The distance of the truck from the building is :

   (a) $50\sqrt{3}$ m (b) $150\sqrt{3}$ m (c) 150 m (d) none of these

3. A tower is $100\sqrt{3}$ metres high. Find the angle of elevation if its top from a point 100 metres away from its foot :

   (a) 30° (b) 45° (c) 60° (d) none of these

4. If a kite is flying at a height of $40\sqrt{3}$ metres from the level ground, attached to a string inclined at 60° to the horizontal, then the length of the string is :

   (a) 80 m (b) $60\sqrt{3}$ m (c) $80\sqrt{3}$ m (d) 120 m

5. A kite is flying at a height of 75 metres from the level ground, attached to a string inclined at 60° to the horizontal. The length of the string to the nearest metre is :

   (a) 86 m (b) 90 m (c) 87 m (d) none of these

6. An electric pole is 10 m high. A steel wire tied to the top of the pole is affixed at a point on the ground to keep the pole upright. If the wire makes an angle of 45° with the horizontal through the foot of the pole, then the length of the wire is :

   (a) 17.32 m (b) 10 m (c) 13.12 m (d) 14.14 m

7. The angle of depression of a boat from the top of a tower 200 m high is 30°, then the distance of the boat from the foot of the tower is :

   (a) 173.2 m (b) 24.64 m (c) 346.4 m (d) none of these

8. If the angles of elevation of the top of a tower from the two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it are complementary, then the height of the tower is :

   (a) 8 m (b) 6 m (c) 10 m (d) none of these

9. The length of a string between a kite and a point on the ground is 85 metres. If the string makes an angle θ with level ground such that $\tan\theta = \dfrac{15}{8}$, how high is the kite ?

   (a) 75 m (b) 150 m (c) 225 m (d) none of these

10. A bridge across a river makes an angle of 45° with the river bank as shown in the given figure. If the length of the bridge across the river is 150 m, what is the width of the river ?

    (a) $50\sqrt{2}$ m (b) $150\sqrt{2}$ m

    (c) 75 m (d) $75\sqrt{2}$ m

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

UNIT- 7 STATISTICS

Chapter-22. Measures of Central Tendency
(Mean, Median and Mode)

Choose the correct option :

1. The measure of central tendency of a statistical data which takes into account all the data is the :

   (a) mode   (b) median   (c) mean   (d) range

2. In the formula, $\bar{x} = a + \dfrac{\Sigma f_i d_i}{\Sigma f_i}$, for finding the mean of grouped data, d_i's are the deviations from a of :

   (a) the lower limits of the classes   (b) the upper limits of the classes

   (c) the mid-points of the classes   (d) the frequencies of the classes

3. For a frequency distribution, mean, median and mode are connected by the relation :

   (a) Mode = 2Median – 3Mean   (b) Mode = 3Median – 2Mean

   (c) Mode = 3Mean – 2Median   (d) None of these

4. Consider the following distribution :

Class	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25
Frequency	10	15	12	20	8

   The sum of tower limits of the median class and modal class is :

   (a) 15   (b) 25   (c) 30   (d) 35

5. The arithmetic mean of 1, 2, 3, 4, 5, ..., n is :

   (a) $\dfrac{n+1}{2}$ (b) $\dfrac{n-1}{2}$ (c) $\dfrac{n}{2}$ (d) $\dfrac{n}{2} + 1$

6. Consider the following frequency distribution :

Class	65 – 85	85 – 105	105 – 125	125 – 145	145 – 165	165 – 185	185 – 205
Frequency	4	5	13	20	14	7	4

   The difference of the upper limit of the median class and the lower limit of the modal class is :

   (a) 0   (b) 19   (c) 38   (d) 20

7. For the following data, what would be its median ?

   40, 68, 18, 27, 12, 44, 17, 48, 55, 32, 47, 21

   (a) 36   (b) 32   (c) 44   (d) none of these

8. If 10, 13, 15, 18, $x + 1$, $x + 3$, 31, 36, 38, 42 are the observations arranged in ascending order with median 28, then what is the value of x ?

   (a) 24   (b) 28   (c) 31   (d) 26

9. If the arithmetic mean of x, $x + 3$, $x + 6$, $x + 9$ and $x + 12$ is 10, then the value of x is :

   (a) 4   (b) 6   (c) 1   (d) 2

10. If the classes of a frequency distribution are 1 – 10, 11 – 20, 21 – 30, ..., 51 – 60, then the size of each class is :

    (a) 9   (b) 10   (c) 11   (d) 5.5

11. The median class for the given distribution is :

Class Interval	0 – 10	10 – 20	20 – 30	30 – 40
Frequency	2	4	3	5

(a) 0 – 10   (b) 10 – 20   (c) 20 – 30   (d) 30 – 40

12. The modal class of a given distribution always corresponds to the :

(a) interval with highest frequency   (b) interval with lowest frequency

(c) the first interval   (d) the last interval

13. The median of a grouped frequency distribution is found graphically by drawing :

(a) a linear graph   (b) a histogram

(c) a frequency polygon   (d) a cumulative frequency curve

14. The modal class of the following frequency distribution is :

Classes	50 – 60	60 – 70	70 – 80	80 – 90	90 – 100
Frequency	4	8	18	19	17

(a) 70-80   (b) 80-90

(c) 90-100   (d) none of these

15. If the mean of observations $x_1, x_2, x_3, ..., x_n$ is $\bar{x}$, then the mean of $x_1 + a, x_2 + a, x_3 + a, ..., x_n + a$ is :

(a) $a\bar{x}$ (b) $\bar{x} - a$ (c) $\bar{x} + a$ (d) $\dfrac{\bar{x}}{a}$

ANSWERS

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

UNIT- 8 PROBABILITY

Chapter-23. Probability

Choose the correct option :

1. If P(E) denotes the probability of an event E, then :

(a) P(E) < 0   (b) P(E) > 0   (c) $0 \le P(E) \le 1$ (d) $-1 \le P(E) \le 1$

2. A number is selected from the numbers 1 to 25. The probability that it is prime is :

(a) $\dfrac{9}{25}$ (b) $\dfrac{1}{6}$ (c) $\dfrac{8}{25}$ (d) $\dfrac{2}{5}$

3. A single letter is selected at random from the word 'PROBABILITY'. The probability of it being a vowel is :

(a) $\dfrac{3}{11}$ (b) $\dfrac{4}{11}$ (c) $\dfrac{5}{11}$ (d) none of these

4. A number is selected from first 50 natural numbers. What is the probability that it is a multiple of 3 or 5 ?

(a) $\dfrac{13}{25}$ (b) $\dfrac{21}{50}$ (c) $\dfrac{12}{25}$ (d) $\dfrac{23}{50}$

5. A card is drawn at random from a pack of 52 cards. The probability that the drawn card is not an ace is :

(a) $\dfrac{1}{13}$ (b) $\dfrac{9}{13}$ (c) $\dfrac{4}{13}$ (d) $\dfrac{12}{13}$

6. The probability of guessing the correct answer to a certain question is $\frac{x}{y}$. If the probability of not guessing the correct answer to this question is $\frac{2}{3}$, then :

   (a) $y = 4x$ (b) $y = 3x$ (c) $y = 2x$ (d) $y = x$

7. Which of the following cannot be the probability of an event ?

   (a) $\frac{4}{9}$ (b) 0.97   (c) –3.7   (d) 46%

8. If the probability of an event is p, then the probability of its complementary event will be :

   (a) $p - 1$ (b) p (c) $1 - p$ (d) $1 - \frac{1}{p}$

9. A person tosses two coins simultaneously. The probability that he gets atmost one head is :

   (a) 1   (b) $\frac{3}{4}$ (c) $\frac{1}{2}$ (d) $\frac{1}{7}$

10. The probability of the sun rising from the east is P(S). The value of P(S) is :

    (a) P(S) = 1   (b) P(S) = 0   (c) P(S) < 1   (d) P(S) < 0

11. Two different dice are thrown simultaneously, then the probability of getting same number on both dice is :

    (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{1}{12}$ (d) $\frac{1}{6}$

12. A month is selected at random in a year. The probability that it is April or December is :

    (a) $\frac{1}{12}$ (b) $\frac{1}{6}$ (c) $\frac{10}{12}$ (d) none of these

13. If two different dice are rolled together, the probability of getting an even number on both dice is :

    (a) $\frac{1}{36}$ (b) $\frac{1}{2}$ (c) $\frac{1}{6}$ (d) $\frac{1}{4}$

14. A card is drawn at random from a well-shuffled deck of 52 cards. What is the probability that the card drawn is neither a king nor a queen ?

    (a) $\frac{11}{13}$ (b) $\frac{12}{13}$ (c) $\frac{8}{52}$ (d) none of these

15. In a box there are 10 non-defective and some defective bulbs. If the probability that a bulb selected at random from the box to be defective is $\frac{2}{7}$, then the number of defective bulbs are :

    (a) 5   (b) 6   (c) 4   (d) none of these

ANSWERS

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