10 MATHS ONE MARK QUESTIONS- BOOK BACK

CHAPTER – 1 (RELATIONS AND FUNCTIONS)

1. If $n(A \times B) = 6$ and $A = \{1,3\}$, then $n(B)$ is
   $(a)\ 1$ $(b)\ 2$ $(c)\ 3$ $(d)\ 6$
2. $A = \{a,\ b,\ p\}$, $B = \{2,3\}$, $C = \{p,q,r,s\}$ then $n[(A \cup C) \times B]$ is
   $(a)\ 8$ $(b)\ 20$ $(c)\ 12$ $(d)\ 16$
3. If $A = \{1,2\}$, $B = \{1,2,3,4\}$, $C = \{5,6\}$ and $D = \{5,6,7,8\}$ then state which of the following statement is true.
   $(a)\ (A \times C) \subset (B \times D)$ $(b)\ (B \times D) \subset (A \times C)$
   $(c)\ (A \times B) \subset (A \times D)$ $(d)\ (D \times A) \subset (B \times A)$
4. If there are 1024 relations from a set $A = \{1,2,3,4,5\}$ to a set B, then the number of elements in B is
   $(a)\ 3$ $(b)\ 2$ $(c)\ 4$ $(d)\ 8$
5. The range of the relation $\mathbb{R} = \{(x,\ x^2) \mid x\ is\ a\ prime\ number\ less\ than\ 13\}$ is
   $(a)\ \{2,3,5,7\}$ $(b)\ \{2,3,5,7,11\}$
   $(c)\ \{4,9,25,49,121\}$ $(d)\ \{1,4,9,25,49,121\}$
6. If the ordered pairs $(a+2, 4)$ and $(5, 2a+b)$ are equal then (a, b) is
   $(a)\ (2,-2)$ $(b)\ (5,1)$ $(c)\ (2,3)$ $(d)\ (3,-2)$
7. Let $n(A) = m$ and $n(B) = n$ then the total number of non - empty relations that can be defined from A to B is
   $(a)\ m^n$ $(b)\ n^m$ $(c)\ 2^{mn} - 1$ $(d)\ 2^{mn}$
8. If $\{(a,8),(6,b)\}$ represents an identity function, then the value of a and b are respectively
   $(a)\ (8,6)$ $(b)\ (8,8)$ $(c)\ (6,8)$ $(d)\ (6,6)$
9. Let $A = \{1,2,3,4\}$ and $B = \{4,8,9,10\}$. A function $f : A \to B$ given by $f = \{(1,4),(2,8),(3,9),(4,10)\}$ is a
   (a) Many – One Function (b) Identity Function
   (c) One – to – One Function (d) Into Function
10. If $f(x) = 2x^2$ and $g(x) = \frac{1}{3x}$, then $f \circ g$ is
    $(a)\ \frac{3}{2x^2}$ $(b)\ \frac{2}{3x^2}$ $(c)\ \frac{2}{9x^2}$ $(d)\ \frac{1}{6x^2}$
11. If $f : A \to B$ is a bijective function and if $n(B) = 7$, then $n(A)$ is equal to.
    $(a)\ 7$ $(b)\ 49$ $(c)\ 1$ $(d)\ 14$
12. Let f and g be two functions given by $f = \{(0,1),(2,0),(3,-4),(4,2),(5,7)\}$ $g = \{(0,2),(1,0),(2,4),(-4,2),(7,0)\}$ then the range of $f \circ g$ is
    $(a)\ \{0,2,3,4,5\}$ $(b)\ \{-4,1,0,2,7\}$
    $(c)\ \{1,2,3,4,5\}$ $(d)\ \{0,1,2\}$
13. Let $f(x) = \sqrt{1+x^2}$ then
    $(a)\ f(xy) = f(x).f(y)$ $(b)\ f(xy) \geq f(x).f(y)$
    $(c)\ f(xy) \leq f(x).f(y)$ (d) None of these
14. If $g = \{(1,1),(2,3),(3,5),(4,7)\}$ is a function given by $g(x) = \alpha x + \beta$ then the value of α and β are
    $(a)\ (-1,2)$ $(b)\ (2,-1)$
    $(c)\ (-1,-2)$ $(d)\ (1,2)$
15. $f(x) = (x+1)^2 - (x-1)^3$ represents a function which is
    (a) Linear (b) Cubic
    (c) Reciprocal (d) Quadratic

CHAPTER – 2 (NUMBERS AND SEQUENCES)

1. Euclid's division lemma states that for positive integers a and b, there exist unique integers q and r such that $a = bq + r$, where r must satisfy.
   $(a)\ 1 < r < b$ $(b)\ 0 < r < b$
   $(c)\ 0 \leq r < b$ $(d)\ 0 < r \leq b$
2. Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are.
   $(a)\ 0,1,8$ $(b)\ 1,4,8$
   $(c)\ 0,1,3$ $(d)\ 1,3,5$
3. If the HCF of 65 and 117 is expressible in the form of $65m - 117$, then the value of m is
   $(a)\ 4$ $(b)\ 2$ $(c)\ 1$ $(d)\ 3$

4. The sum of the exponents of the prime factors in the prime factorization of 1729 is
   (a) 1 (b) 2 (c) 3 (d) 4
5. The least number that is divisible by all the numbers from 1 to 10 (both exclusive) is
   (a) 2025 (b) 5220 (c) 5025 (d) 2520
6. $7^{4k} \equiv$ ____$(mod\ 100)$
   (a) 1 (b) 2 (c) 3 (d) 4
7. Given $F_1 = 1, F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_5 is
   (a) 3 (b) 5 (c) 8 (d) 11
8. The first term of an arithmetic progression is unity and the common difference is 4. Which of the following will be a term of this A. P.
   (a) 4551 (b) 10091 (c) 7881 (d) 13531
9. If 6 times of 6^{th} term of an A.P is equal to 7 times the 7^{th} term , then the 13^{th} term of the A.P is
   (a) 0 (b) 6 (c) 7 (d) 13
10. An A.P consists of 31 terms. If its 16^{th} term is m, then the sum of all the terms of this A.P is
    (a) 16 m (b) 62 m (c) 31 m (d) $\frac{31}{2}$ m
11. In an A.P the first term is 1 and the common difference is 4. How many terms of the A.P must be taken for their sum to be equal to 120?.
    (a) 6 (b) 7 (c) 8 (d) 9
12. If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + \cdots + 2^0$ which of the following is true?.
    (a) B is 2^{64} more than A
    (b) A and B are Equal
    (c) B is larger than A by 1
    (d) A is larger than B by 1
13. The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \ldots$ is
    (a) $\frac{1}{24}$ (b) $\frac{1}{27}$ (c) $\frac{2}{3}$ (d) $\frac{1}{81}$
14. If the sequence $t_1, t_2, t_3, \ldots$ are in A.P then the sequence $t_6, t_{12}, t_{18}, \ldots$ is
    (a) A Geometric Progression
    (b) An Arithmetic Progression
    (c) Neither an Arithmetic Progression nor a Geometric Progression
    (d) a constant sequence
15. The value of $(1^3 + 2^3 + 3^3 + \cdots + 15^3) - (1 + 2 + 3 + \cdots + 15)$ is
    (a)14400 (b) 14200 (c) 14280
    (d) 14520

CHAPTER – 3 (ALGEBRA)

1. A system of three linear equations in three variables is inconsistent if their planes.
   (a) Intersect only at a point
   (b) Intersect in a line
   (c) Coincides with each other
   (d) do not intersect
2. The solution of the system $x + y - 3x = -6$, $-7y + 7z = 7, 3z = 9$ is
   (a) $x = 1, y = 2, z = 3$
   (b) $x = -1, y = 2, z = 3$
   (c) $x = -1, y = -2, z = 3$
   (d) $x = 1, y = -2, z = 3$
3. If $(x - 6)$ is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is
   (a) 3 (b) 5 (c) 6 (d) 8
4. $\frac{3y-3}{y} \div \frac{7y-7}{3y^2}$ is
   (a) $\frac{9y}{7}$ (b) $\frac{9y^3}{(21y-21)}$
   (c) $\frac{21y^2-42y+21}{3y^3}$ (d) $\frac{7(y^2-2y+1)}{y^2}$
5. $y^2 + \frac{1}{y^2}$ is not equal to
   (a) $\frac{y^4+1}{y^2}$ (b) $\left(y + \frac{1}{y}\right)^2$
   (c) $\left(y - \frac{1}{y}\right)^2 + 2$ (d) $\left(y + \frac{1}{y}\right)^2 - 2$
6. $\frac{x}{x^2-25} - \frac{x}{x^2+6x+5}$ gives
   (a) $\frac{x^2-7x+40}{(x-5)(x+5)}$ (b) $\frac{x^2+7x+40}{(x-5)(x+5)(x+1)}$
   (c) $\frac{x^2-7x+40}{(x^2-25)(x+1)}$ (d) $\frac{x^2+10}{(x^2-25)(x+1)}$

7. The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to

$(a)\ \frac{16}{5}\left|\frac{x^2z^4}{y^2}\right|$ $(b)\ 16\left|\frac{y^2}{x^2z^4}\right|$

$(c)\ \frac{16}{5}\left|\frac{y}{xz^2}\right|$ $(d)\ \frac{16}{5}\left|\frac{xz^2}{y}\right|$

8. Which of the following should be added to make $x^4 + 64$ a perfect square

$(a)\ 4x^2$ $(b)\ 16x^2$ $(c)\ 8x^2$ $(d)\ -8x^2$

9. The solution of $(2x-1)^2 = 9$ is equal to

$(a)\ -1$ $(b)\ 2$ $(c)\ -1, 2$

(d) None of these

10. The value of a and b if $4x^4 - 24x^3 + 76x^2 + ax + b$ is a perfect square are

$(a)\ 100, 120$ $(b)\ 10, 12$

$(c)\ -120, 100$ $(d)\ 12, 10$

11. If the roots of the equation $q^2x^2 + p^2x + r^2 = 0$ are the squares of the roots of the equation $qx^2 + px + r = 0$ then q, p, r are in _____.

(a) A.P (b) G.P

(c) Both A.P and G.P (d) None of these

12. Graph of a linear equation is a _____.

(a) Straight line (b) Circle

(c) Parabola (d) Hyperbola

13. The number of points of intersection of the quadratic polynomial $x^2 + 4x + 4$ with the X axis is

$(a)\ 0$ $(b)\ 1$ $(c)\ 0\ or\ 1$ $(d)\ 2$

14. For the given matrix $A = \begin{pmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 9 & 11 & 13 & 15 \end{pmatrix}$ the order of the matrix A^T is

$(a)\ 2 \times 3$ $(b)\ 3 \times 2$ $(c)\ 3 \times 4$ $(d)\ 4 \times 3$

15. If A is a 2×3 matrix and B is a 3×4 matrix how many columns does AB have

$(a)\ 3$ $(b)\ 4$ $(c)\ 2$ $(d)\ 5$

16. If number of columns and rows are not equal in a matrix then it is said to be a

(a) Diagonal matrix (b) Rectangular matrix

(c) Square matrix (d) Identity matrix

17. Transpose of a column matrix is

(a) Unit matrix (b) Diagonal matrix

(c) Column matrix (d) Row matrix

18. Find the matrix X if $2X + \begin{pmatrix} 1 & 3 \\ 5 & 7 \end{pmatrix} = \begin{pmatrix} 5 & 7 \\ 9 & 5 \end{pmatrix}$

$(a)\ \begin{pmatrix} -2 & -2 \\ 2 & -1 \end{pmatrix}$ $(b)\ \begin{pmatrix} 2 & 2 \\ 2 & -1 \end{pmatrix}$

$(c)\ \begin{pmatrix} 1 & 2 \\ 2 & 2 \end{pmatrix}$ $(d)\ \begin{pmatrix} 2 & 1 \\ 2 & 2 \end{pmatrix}$

19. Which of the following can be calculated from the given matrices $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}, B = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$

$(i)\ A^2$ $(ii)\ B^2$ $(iii)\ AB$ $(iv)\ BA$

$(a)\ (i)$ and (ii) only $(b)\ (ii)$ and (iii) only

$(c)\ (ii)$ and (iv) only (d) All of these

20. If $A = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 0 \\ 2 & -1 \\ 0 & 2 \end{pmatrix}$ and $C = \begin{pmatrix} 0 & 1 \\ -2 & 5 \end{pmatrix}$ which of the following statements are correct?. $(i)\ AB + C = \begin{pmatrix} 5 & 5 \\ 5 & 5 \end{pmatrix}$

$(ii)\ BC = \begin{pmatrix} 0 & 1 \\ 2 & -3 \\ -4 & 10 \end{pmatrix}$ $(iii)\ BA + C = \begin{pmatrix} 2 & 5 \\ 3 & 0 \end{pmatrix}$

$(iv)\ (AB)C = \begin{pmatrix} -8 & 20 \\ -8 & 13 \end{pmatrix}$

$(a)\ (i)$ and (ii) only $(b)\ (ii)$ and (iii) only

$(c)\ (iii)$ and (iv) only (d) All of these

CHAPTER – 4 (GEOMETRY)

1. If in triangles ABC and EDF, $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar, when

$(a)\ \angle B = \angle E$ $(b)\ \angle A = \angle D$

$(c)\ \angle B = \angle D$ $(d)\ \angle A = \angle F$

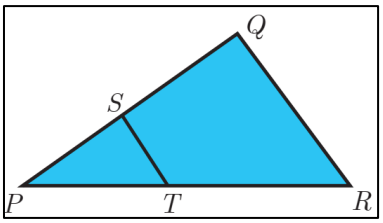
2. In $\Delta LMN, \angle L = 60^\circ, \angle M = 50^\circ$. If $\Delta LMN \sim \Delta PQR$ then the value of $\angle R$ is.

$(a)\ 40^\circ$ $(b)\ 70^\circ$ $(c)\ 30^\circ$ $(d)\ 110^\circ$

3. If ΔABC is an isosceles triangle with $\angle C = 90^\circ$ and $AC = 5\ cm$ then AB is

$(a)\ 2.5\ cm$ $(b)\ 5\ cm$ $(c)\ 10\ cm$ $(d)\ 5\sqrt{2}\ cm$

4. In a given figure $ST \parallel QR, PS = 2\ cm$ and $SQ = 3\ cm$. Then the ratio of the area of ΔPQR to the area of ΔPST is



$(a)\ 25:4$
$(b)\ 25:7$
$(c)\ 25:11$
$(d)\ 25:13$

5. The perimeters of two similar triangles ΔABC and ΔPQR are 36 cm and 24 cm respectively. If $PQ = 10\ cm$, then the length of AB is

$(a)\ 6\frac{2}{3}\ cm$ $(b)\ \frac{10\sqrt{6}}{3}\ cm$ $(c)\ 66\frac{2}{3}\ cm$ $(d)\ 15\ cm$

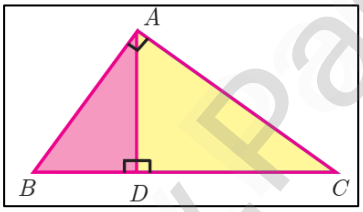
6. If in $\Delta ABC, DE \parallel BC. AB = 3.6\ cm,\ AC = 2.4\ cm$ and $AD = 2.1\ cm$ then the length of AE is

$(a)\ 1.4\ cm$ $(b)\ 1.8\ cm$ $(c)\ 1.2\ cm$ $(d)\ 1.05\ cm$

7. In a ΔABC, AD is the bisector of $\angle BAC$. If $AB = 8\ cm, BD = 6\ cm$ and $DC = 3\ cm$. The length of the side AC is

$(a)\ 6\ cm$ $(b)\ 4\ cm$ $(c)\ 3\ cm$ $(d)\ 8\ cm$

8. In the adjacent figure $\angle BAC = 90^\circ$ and $AD \perp BC$ then

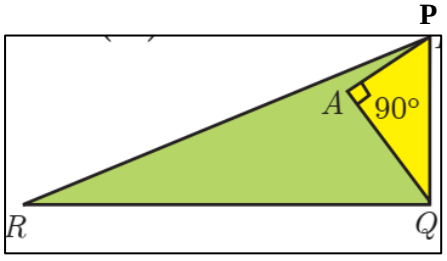


$(a)\ BD.CD = BC^2$
$(b)\ AB.AC = BC^2$
$(c)\ BD.CD = AD^2$
$(d)\ AB.AC = AD^2$

9. Two poles of heights 6 m and 11 m stand vertically on a plane ground. If the distance between their feet is 12 m , what is the distance between their tops?.

$(a)\ 13\ m$ $(b)\ 14\ m$ $(c)\ 15\ m$ $(d)\ 12.8\ m$

10. In the given figure, $PR = 26\ cm,\ QR = 24\ cm, \angle PAQ = 90^\circ,\ PA = 6\ cm$ and $QA = 8\ cm$. Find $\angle PQR$



$(a)\ 80^\circ$
$(b)\ 85^\circ$
$(c)\ 75^\circ$
$(d)\ 90^\circ$

11. A tangent is perpendicular to the radius at the

(a) Centre (b) Point of contact
(c) Infinity (d) Chord

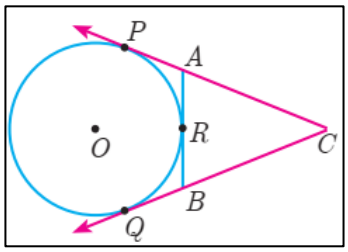
12. How many tangents can be drawn to the circle from an exterior point?.

(a) One (b) Two
(c) Infinite (d) Zero

13. The two tangents from an external points P to a circle with centre at O are PA and PB. If $\angle APB = 70^\circ$ then the value of $\angle AOB$ is

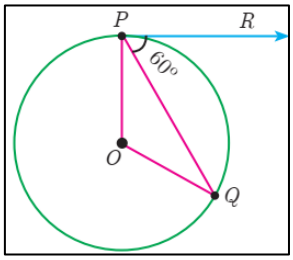
$(a)\ 100^\circ$ $(b)\ 110^\circ$ $(c)\ 120^\circ$ $(d)\ 130^\circ$

14. In figure CP and CQ are tangents to a circle with centre at O. ARB is another tangent touching the circle at R. If $CP = 11\ cm$ and $BC = 7\ cm$, then the length of BR is



$(a)\ 6\ cm$
$(b)\ 6\ cm$
$(c)\ 8\ cm$
$(d)\ 4\ cm$

15. In figure if PR is tangent to the circle at P and O is the centre of the circle, then $\angle POQ$ is



$(a)\ 120^\circ$ $(b)\ 100^\circ$
$(c)\ 110^\circ$ $(d)\ 90^\circ$

CHAPTER – 5 (COORDINATE GEOMETRY)

1. The area of triangle formed by the points $(-5, 0), (0, -5)$ and $(5, 0)$ is.

$(a)\ 0\ sq.units$ $(b)\ 25\ sq.units$
$(c)\ 5\ sq.units$ (d) None of these

2. A man walks near a wall, such that the distance between him and the wall is 10 units. Consider the wall to be the Y axis. The path travelled by the man is

$(a)\ x = 10$ $(b)\ y = 10$
$(c)\ x = 0$ $(d)\ y = 0$

3. The straight line given by the equation $x = 11$ is
   (a) Parallel to X axis (b) Parallel to Y axis
   (c) Passing through the origin
   (d) Passing through the point $(0,11)$
4. If $(5,7),(3,p)$ and $(6,6)$ are collinear, then the value of p is
   $(a)\ 3$ $(b)\ 6$ $(c)\ 9$ $(d)\ 12$
5. The point of intersection of $3x - y = 4$ and $x + y = 8$ is
   $(a)\ (5,3)$ $(b)\ (2.4)$ $(c)\ (3,5)$ $(d)\ (4,4)$
6. The slope of the line joining $(12,3),(4,a)$ is $\frac{1}{8}$. The vale of 'a' is
   $(a)\ 1$ $(b)\ 4$ $(c)\ -5$ $(d)\ 2$
7. The slope of the line which is perpendicular to a line joining the points $(0,0)$ and $(-8,8)$ is
   $(a)\ -1$ $(b)\ 1$ $(c)\ \frac{1}{3}$ $(d)\ -8$
8. If slope of the line PQ is $\frac{1}{\sqrt{3}}$ then slope of the perpendicular bisector of PQ is
   $(a)\ \sqrt{3}$ $(b)\ -\sqrt{3}$ $(c)\ \frac{1}{\sqrt{3}}$ $(d)\ 0$
9. If A is a point on the Y axis whose ordinate is 8 and B is a point on the X axis whose abscissae is 5 then the equation of the line AB is
   $(a)\ 8x + 5y = 40$ $(b)\ 8x - 5y = 40$
   $(c) x = 8$ $(d)\ y = 5$
10. The equation of a line passing through the origin and perpendicular to the line $7x - 3y + 4 = 0$ is
    $(a)\ 7x - 3y + 4 = 0$ $(b)\ 3x - 7y + 4 = 0$
    $(c)\ 3x + 7y = 0$ $(d)\ 7x - 3y = 0$
11. Consider four straight lines $(i)\ l_1; 3y = 4x + 5$
    $(ii)\ l_2; 4y = 3x - 1$ $(iii)\ l_3; 4y + 3x = 7$
    $(iv)\ l_4; 4x + 3y = 2$
    Which of the following statement is true?.
    $(a)\ l_1$ and l_2 are perpendicular
    $(b)\ l_1$ and l_4 are parallel
    $(c)\ l_2$ and l_4 are perpendicular
    $(d)\ l_2$ and l_3 are parallel
12. A straight line has equation $8y = 4x + 21$. Which of the following is true
    (a) The slope is 0.5 and the y intercept is 2.6
    (b) The slope is 5 and the y intercept is 1.6
    (c) The slope is 0.5 and the y intercept is 1.6
    (d) The slope is 5 and the y intercept is 2.6
13. When proving that a quadrilateral is a trapezium, it is necessary to show
    (a) Two sides are parallel
    (b) Two parallel and two non – parallel sides
    (c) Opposite sides are parallel
    (d) All sides are of equal length
14. When proving that a quadrilateral is a parallelogram by using slopes you must find
    (a) The slopes of two sides
    (b) The slopes of two pair of opposite sides
    (c) The lengths of all sides
    (d) Both the lengths and slopes of two sides
15. $(2,1)$ is the point of intersection of two lines
    $(a)\ x - y - 3 = 0\ ; 3x - y - 7 = 0$
    $(b)\ x + y = 3;\ 3x + y = 7$
    $(c)\ 3x + y = 3;\ x + y = 7$
    $(d)\ x + 3y - 3 = 0; x - y - 7 = 0$

CHAPTER – 6 (TRIGONOMETRY)

1. The value of $sin^2\theta + \frac{1}{1+tan^2\theta}$ is equal to
   $(a)\ tan^2\theta$ $(b) 1$ $(c)\ cot^2\theta$ $(d)\ 0$
2. $\tan\theta cosec^2\theta - \tan\theta$ is equal to
   $(a)\ \sec\theta$ $(b) cot^2\theta$ $(c)\ \sin\theta$ $(d)\ \cot\theta$
3. If $(\sin\alpha + cosec\ \alpha)^2 + (\cos\alpha + sec\ \alpha)^2 = k + tan^2\alpha + cot^2\alpha$, then the value of k is equal to
   $(a)\ 9$ $(b)\ 7$ $(c)\ 5$ $(d)\ 3$
4. If $\sin\theta + \cos\theta = a$ and $\sec\theta + \text{cosec}\,\theta = b$, then the value of $b(a^2 - 1)$ is equal to
   $(a)\ 2a$ $(b)\ 3a$ $(c)\ 0$ $(d)\ 2ab$

5. If $5x = \sec\theta$ and $\frac{5}{y} = \tan\theta$, then $x^2 - \frac{1}{y^2}$ is equal to

   $(a)\ 25 \quad (b)\ \frac{1}{25} \quad (c)\ 5 \quad (d)\ 1$

6. If $\sin\theta = \cos\theta$, then $2tan^2\theta + sin^2\theta - 1$ is equal to

   $(a)\ \frac{-3}{2} \quad (b)\ \frac{3}{2} \quad (c)\ \frac{2}{3} \quad (d)\ \frac{-2}{3}$

7. If $x = a\tan\theta$ and $y = b\sec\theta$ then

   $(a)\ \frac{y^2}{b^2} - \frac{x^2}{a^2} = 1 \quad (b)\ \frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

   $(c)\ \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \quad (d)\ \frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$

8. $(1 + \tan\theta + \sec\theta)(1 + \cot\theta - cosec\ \theta)$ is equal to

   $(a)\ 0 \quad (b)\ 1 \quad (c)\ 2 \quad (d)\ -1$

9. $a\cot\theta + b\ cosec\ \theta = p$ and $b\cot\theta + a\ cosec\ \theta = q$ then $p^2 - q^2$ is equal to

   $(a)\ a^2 - b^2 \quad (b)\ b^2 - a^2 \quad (c)\ a^2 + b^2 \quad (d)\ b - a$

10. If the ratio of the height of a tower and the length of its shadow is $\sqrt{3} : 1$, then the angle of elevation of the sun has measure

    $(a)\ 45^\circ \quad (b)\ 30^\circ \quad (c)\ 90^\circ \quad (d)\ 60^\circ$

11. The electric pole subtends an angle of 30° at a point on the same level as its foot. At a second point ' b' metres above the first, the depression of the foot of the pole is 60°. The height of the pole (in metres) is equal to

    $(a)\ \sqrt{3}\ b \quad (b)\ \frac{b}{3} \quad (c)\ \frac{b}{2} \quad (d)\ \frac{b}{\sqrt{3}}$

12. A tower is 60 m heigh. Its shadow reduces by x metres when the angle of elevation of the sun increases from 30° to 45° then x is equal to

    $(a)\ 41.92\ m \quad (b)\ 43.92\ m \quad (c)\ 43\ m \quad (d) 45.6\ m$

13. The angle of depression of the top and bottom of 20 m tall building from the top of a multistoried building are 30° and 60° respectively. The height of the multistoried building and the distance between two building (in metres) is

    $(a)\ 20, 10\sqrt{3}\ (b)\ 30, 5\sqrt{3}\ \ (c)\ 20{,}10\ (d)\ 30{,}10\sqrt{3}$

14. Two persons are standing 'x' metres apart from each other and the height of the first person is double that of the other. If from the middle point of the line joining their feet an observer finds the angular elevations of their tops to be complementary, then the height of the shorter person (in metres) is

    $(a)\ \sqrt{2}\ x \quad (b)\ \frac{x}{2\sqrt{2}} \quad (c)\ \frac{x}{\sqrt{2}} \quad (d)\ 2x$

15. The angle of elevation of a cloud from a point h metres above a lake is β . The angle of depression of its reflection in the lake is 45°. The height of location of the cloud from the lake is

    $(a)\ \frac{h(1+\tan\beta)}{1-\tan\beta} \quad (b)\ \frac{h(1-\tan\beta)}{1+\tan\beta}$

    $(c)\ h\tan(45^\circ - \beta) \quad (d)$ None of these

CHAPTER – 7 (MENSURATION)

1. The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is

   $(a)\ 60\pi\ cm^2 \quad (b)\ 68\pi\ cm^2$

   $(c)\ 120\pi\ cm^2 \quad (d)\ 136\pi\ cm^2$

2. If two solid hemispheres of same base radius r units are joined together along their bases, then curved surface area of this new solid is

   $(a)\ 4\pi r^2$ sq. units $\quad (b)\ 6\pi r^2$ sq. units

   $(c)\ 3\pi r^2$ sq. units $\quad (d)\ 8\pi r^2$ sq. units

3. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be

   $(a)\ 12\ cm \quad (b)\ 10\ cm \quad (c)\ 13\ cm \quad (d)\ 5\ cm$

4. If the radius of the base of a right circular cylinder is halved keeping the same height, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is

   $(a)\ 1:2 \quad (b)\ 1:4 \quad (c)\ 1:6 \quad (d) 1:8$

5. The total surface area of a cylinder whose radius is $\frac{1}{3}$ of its height is

   $(a)\ \frac{9\pi h^2}{8}$ sq. units $\quad (b)\ 24\pi h^2$ sq. units

(c) $\frac{8\pi h^2}{9}$ sq. units (d) $\frac{56\pi h^2}{9}$ sq. units

6. In a hollow cylinder, the sum of the external and internal radii is 14 cm and the width is 4 cm. If its height is 20 cm, the volume of the material in it is
   (a) $5600\pi\ cm^3$ (b) $1120\pi\ cm^3$
   (c) $56\pi\ cm^3$ (d) $3600\pi\ cm^3$
7. If the radius of the base of a cone is tripled and the height is doubled then the volume is
   (a) Made 6 times (b) Made 18 times
   (c) Made 12 times (d) Unchanged
8. The total surface area of a hemi – sphere is how much times the square of its radius.
   (a) π (b) 4π (c) 3π (d) 2π
9. A solid sphere of radius x cm is melted and cast into a shape of a solid cone of same radius. The height of the cone is
   (a) $3x\ cm$ (b) $x\ cm$ (c) $4x\ cm$ $(d)2x\ cm$
10. A frustrum of a right circular cone is of height 16 cm with radii of its as 8 cm and 20 cm. Then, the volume of the frustrum is
    (a) $3328\pi\ cm^3$ (b) $3228\pi\ cm^3$
    (c) $3240\pi\ cm^3$ (d) $3340\pi\ cm^3$
11. A shuttle cock used for playing badminton has the shape of the combination of
    (a) A cylinder and a sphere
    (b) A hemisphere and a cone
    (c) A sphere and a cone
    (d) Frustrum of a cone and a hemisphere
12. A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r_2 units. Then $r_1 : r_2$ is
    (a) $2:1$ (b) $1:2$ (c) $4:1$ (d) $1:4$
13. The volume (in cm^3) of the greatest sphere that can be cut off from a cylindrical log of wood of base radius 1 cm and height 5 cm is
    (a) $\frac{4}{3}\pi$ (b) $\frac{10}{3}\pi$ (c) 5π (d) $\frac{20}{3}\pi$
14. The height and radius of the cone of which the frustrum is a part are h_1 units and r_1 units respectively. Height of the frustrum is h_2 units and radius of the smaller base is r_2 units. If $h_2 : h_1 = 1:2$ then $r_2 : r_1$ is
    (a) $1:3$ (b) $1:2$ (c) $2:1$ (d) $3:1$
15. The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height is
    (a) $1:2:3$ (b) $2:1:3$
    (c) $1:3:2$ (d) $3:1:2$

CHAPTER – 8 (STATISTICS ANDPROBABILITY)

1. Which of the following is not a measure of dispersion?.
   (a) Range (b) Standard deviation
   (c) Arithmetic Mean (d) Variance
2. The range of the data $8, 8, 8, 8, \ldots 8$ is
   (a) 0 (b) 1 (c) 8 (d) 3
3. The sum of all deviations of the data from its mean is
   (a) Always positive (b) Always negative
   (c) Zero (d) Non – Zero integer
4. The mean of 100 observations is 40 and their standard deviation is 3. The sum of squares of all observations is
   (a) 40000 (b) 160900 (c) 160000 (d) 30000
5. Variance of first 20 natural numbers is
   (a) 32.25 (b) 44.25 (c) 33.25 (d) 30
6. The standard deviation of a data is 3. If each value is multiplied by 5 then the new variance is
   (a) 3 (b) 15 (c) 5 (d) 225
7. If the standard deviation of x, y, z is p then the standard deviation of $3x+5, 3y+5, 3z+5$ is
   (a) $3p+5$ (b) $3p$ (c) $p+5$ (d) $9p+15$
8. If the mean and coefficient of variation of a data are 4 and 87.5 % then the standard deviation is
   (a) 3.5 (b) 3 (c) 4.5 (d) 2.5

9. Which of the following is incorrect?.

   $(a)\ P(A) > 1$ $(b)\ 0 \leq P(A) \leq 1$

   $(c)\ P(\phi) = 0$ $(d)\ P(A) + P(\bar{A}) = 1$

10. The probability a red marble selected at random from a jar containing p red, q blue and r green marbles is

    $(a)\ \frac{q}{p+q+r}$ $(b)\ \frac{p}{p+q+r}$ $(c)\ \frac{p+q}{p+q+r}$ $(d)\ \frac{p+r}{p+q+r}$

11. A page is selected at random from a book. The probability that the digit at units place of the page number chosen is less than 7 is

    $(a)\ \frac{3}{10}$ $(b)\ \frac{7}{10}$ $(c)\ \frac{3}{9}$ $(d)\ \frac{7}{9}$

12. The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is

    $(a)\ 2$ $(b)\ 1$ $(c)\ 3$ $(d)\ 1.5$

13. Kamalan went to play a lucky draw contest. 135 tickets of the lucky draw were sold. If the probability of Kamalan winning is $\frac{1}{9}$, then the number of tickets bought by Kamalan is

    $(a)\ 5$ $(b)\ 10$ $(c)\ 15$ $(d)\ 20$

14. If a letter is chosen at random from the English alphabets $\{a, b, \ldots z\}$, then the probability that the letter chosen precedes x

    $(a)\ \frac{12}{13}$ $(b)\ \frac{1}{13}$ $(c)\ \frac{23}{26}$ $(d)\ \frac{3}{26}$

15. A purse contains 10 notes of ₹ 2000, 15 notes of ₹ 500, and 25 notes of ₹ 200. One note is drawn at random. What is the probability that the note is either a ₹ 500 note or ₹ 200 note?

    $(a)\ \frac{1}{5}$ $(b)\ \frac{3}{10}$ $(c)\ \frac{2}{3}$ $(d)\ \frac{4}{5}$

***

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PG – TEACHER

All the best Students

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ROUGH WORK

10 MATHS ONE MARK QUESTIONS ANSWER- BOOK BACK

CHAPTER – 1 (RELATIONS AND FUNCTIONS)

1. If $n(A \times B) = 6$ and $A = \{1,3\}$, then $n(B)$ is

   (a) 1 (b) 2 **(c) 3** (d) 6

2. $A = \{a,\ b,\ p\}$, $B = \{2,3\}$, $C = \{p,q,r,s\}$ then $n[(A \cup C) \times B]$ is

   (a) 8 (b) 20 **(c) 12** (d) 16

3. If $A = \{1,2\}$, $B = \{1,2,3,4\}$, $C = \{5,6\}$ and $D = \{5,6,7,8\}$ then state which of the following statement is true.

   (a) $(A \times C) \subset (B \times D)$ (b) $(B \times D) \subset (A \times C)$

   (c) $(A \times B) \subset (A \times D)$ (d) $(D \times A) \subset (B \times A)$

4. If there are 1024 relations from a set $A = \{1,2,3,4,5\}$ to a set B, then the number of elements in B is

   (a) 3 **(b) 2** (c) 4 (d) 8

5. The range of the relation $\mathbb{R} = \{(x,\ x^2) \mid x\ is\ a\ prime\ number\ less\ than\ 13\}$ is

   (a) {2,3,5,7} (b) {2,3,5,7,11}

   (c) {4,9,25,49,121} (d) {1,4,9,25,49,121}

6. If the ordered pairs $(a+2, 4)$ and $(5, 2a+b)$ are equal then (a, b) is

   (a) $(2,-2)$ (b) (5,1) (c) (2,3) **(d) $(3,-2)$**

7. Let $n(A) = m$ and $n(B) = n$ then the total number of non - empty relations that can be defined from A to B is

   (a) m^n (b) n^m **(c) $2^{mn} - 1$** (d) 2^{mn}

8. If $\{(a,8),(6,b)\}$ represents an identity function, then the value of a and b are respectively

   (a) (8,6) (b) (8,8) (c) (6,8) (d) (6,6)

9. Let $A = \{1,2,3,4\}$ and $B = \{4,8,9,10\}$. A function $f : A \to B$ given by $f = \{(1,4),(2,8),(3,9),(4,10)\}$ is a

   (a) Many – One Function (b) Identity Function

   (c) One – to – One Function (d) Into Function

10. If $f(x) = 2x^2$ and $g(x) = \frac{1}{3x}$, then $f \circ g$ is

    (a) $\frac{3}{2x^2}$ (b) $\frac{2}{3x^2}$ **(c) $\frac{2}{9x^2}$** (d) $\frac{1}{6x^2}$

11. If $f : A \to B$ is a bijective function and if $n(B) = 7$, then $n(A)$ is equal to.

    (a) 7 (b) 49 (c) 1 (d) 14

12. Let f and g be two functions given by $f = \{(0,1),(2,0),(3,-4),(4,2),(5,7)\}$ $g = \{(0,2),(1,0),(2,4),(-4,2),(7,0)\}$ then the range of $f \circ g$ is

    (a) {0,2,3,4,5} (b) $\{-4,1,0,2,7\}$

    (c) {1,2,3,4,5} **(d) {0,1,2}**

13. Let $f(x) = \sqrt{1+x^2}$ then

    (a) $f(xy) = f(x).f(y)$ (b) $f(xy) \geq f(x).f(y)$

    (c) $f(xy) \leq f(x).f(y)$ (d) None of these

14. If $g = \{(1,1),(2,3),(3,5),(4,7)\}$ is a function given by $g(x) = \alpha x + \beta$ then the value of α and β are

    (a) $(-1,2)$ **(b) $(2,-1)$**

    (c) $(-1,-2)$ (d) (1,2)

15. $f(x) = (x+1)^2 - (x-1)^3$ represents a function which is

    (a) Linear (b) Cubic

    (c) Reciprocal **(d) Quadratic**

CHAPTER – 2 (NUMBERS AND SEQUENCES)

1. Euclid's division lemma states that for positive integers a and b, there exist unique integers q and r such that $a = bq + r$, where r must satisfy.

   (a) $1 < r < b$ (b) $0 < r < b$

   (c) $0 \leq r < b$ (d) $0 < r \leq b$

2. Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are.

   (a) 0, 1, 8 (b) 1, 4, 8

   (c) 0, 1, 3 (d) 1, 3, 5

3. If the HCF of 65 and 117 is expressible in the form of $65m - 117$, then the value of m is

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

4. The sum of the exponents of the prime factors in the prime factorization of 1729 is

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

5. The least number that is divisible by all the numbers from 1 to 10 (both exclusive) is

   (a) 2025 (b) 5220 (c) 5025 $\boxed{(d)\ 2520}$

6. $7^{4k} \equiv$ ____$(mod\ 100)$

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

7. Given $F_1 = 1, F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_5 is

   (a) 3 (b) 5 (c) 8 $\boxed{(d)\ 11}$

8. The first term of an arithmetic progression is unity and the common difference is 4. Which of the following will be a term of this A. P.

   (a) 4551 (b) 10091 $\boxed{(c)\ 7881}$ (d) 13531

9. If 6 times of 6^{th} term of an A.P is equal to 7 times the 7^{th} term , then the 13^{th} term of the A.P is

   $\boxed{(a)\ 0}$ (b) 6 (c) 7 (d) 13

10. An A.P consists of 31 terms. If its 16^{th} term is m, then the sum of all the terms of this A.P is

    $(a)\ 16\,m$ $(b)\ 62\,m$ $\boxed{(c)\ 31\,m}$ $(d)\ \frac{31}{2}\,m$

11. In an A.P the first term is 1 and the common difference is 4. How many terms of the A.P must be taken for their sum to be equal to 120?.

    (a) 6 (b) 7 $\boxed{(c)\ 8}$ (d) 9

12. If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + \cdots + 2^0$ which of the following is true?.

    (a) B is 2^{64} more than A

    (b) A and B are Equal

    (c) B is larger than A by 1

    $\boxed{(d)\ \text{A is larger than B by 1}}$

13. The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \ldots$ is

    $(a)\ \frac{1}{24}$ $\boxed{(b)\ \frac{1}{27}}$ $(c)\ \frac{2}{3}$ $(d)\ \frac{1}{81}$

14. If the sequence $t_1, t_2, t_3, \ldots$ are in A.P then the sequence $t_6, t_{12}, t_{18}, \ldots$ is

    (a) A Geometric Progression

    $\boxed{(b)\ \text{An Arithmetic Progression}}$

    (c) Neither an Arithmetic Progression nor a Geometric Progression

    (d) a constant sequence

15. The value of $(1^3 + 2^3 + 3^3 + \cdots + 15^3) - (1 + 2 + 3 + \cdots + 15)$ is

    $(a)14400$ (b) 14200 $\boxed{(c)\ 14280}$

    (d) 14520

CHAPTER – 3 (ALGEBRA)

1. A system of three linear equations in three variables is inconsistent if their planes.

   (a) Intersect only at a point

   (b) Intersect in a line

   (c) Coincides with each other

   $\boxed{(d)\ \text{do not intersect}}$

2. The solution of the system $x + y - 3x = -6$, $-7y + 7z = 7, 3z = 9$ is

   $\boxed{(a)\ x = 1, y = 2, z = 3}$

   $(b)\ x = -1, y = 2, z = 3$

   $(c)\ x = -1, y = -2, z = 3$

   $(d)\ x = 1, y = -2, z = 3$

3. If $(x - 6)$ is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is

   (a) 3 $\boxed{(b)\ 5}$ (c) 6 (d) 8

4. $\frac{3y-3}{y} \div \frac{7y-7}{3y^2}$ is

   $\boxed{(a)\ \frac{9y}{7}}$ $(b)\ \frac{9y^3}{(21y-21)}$

   $(c)\ \frac{21y^2-42y+21}{3y^3}$ $(d)\ \frac{7(y^2-2y+1)}{y^2}$

5. $y^2 + \frac{1}{y^2}$ is not equal to

   $(a)\ \frac{y^4+1}{y^2}$ $\boxed{(b)\ \left(y + \frac{1}{y}\right)^2}$

   $(c)\ \left(y - \frac{1}{y}\right)^2 + 2$ $(d)\ \left(y + \frac{1}{y}\right)^2 - 2$

6. $\frac{x}{x^2-25} - \frac{x}{x^2+6x+5}$ gives

   $(a)\ \frac{x^2-7x+40}{(x-5)(x+5)}$ $(b)\ \frac{x^2+7x+40}{(x-5)(x+5)(x+1)}$

   $\boxed{(c)\ \frac{x^2-7x+40}{(x^2-25)(x+1)}}$ $(d)\ \frac{x^2+10}{(x^2-25)(x+1)}$

7. The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to

$(a)\ \frac{16}{5}\left|\frac{x^2z^4}{y^2}\right|$ $(b)\ 16\left|\frac{y^2}{x^2z^4}\right|$

$(c)\ \frac{16}{5}\left|\frac{y}{xz^2}\right|$ $\boxed{(d)\ \frac{16}{5}\left|\frac{xz^2}{y}\right|}$

8. Which of the following should be added to make $x^4 + 64$ a perfect square

$(a)\ 4x^2$ $\boxed{(b)\ 16x^2}$ $(c)\ 8x^2$ $(d)\ -8x^2$

9. The solution of $(2x-1)^2 = 9$ is equal to

$(a)\ -1$ $(b)\ 2$ $\boxed{(c)\ -1, 2}$

(d) None of these

10. The value of a and b if $4x^4 - 24x^3 + 76x^2 + ax + b$ is a perfect square are

$(a)\ 100, 120$ $(b)\ 10, 12$

$\boxed{(c)\ -120, 100}$ $(d)\ 12, 10$

11. If the roots of the equation $q^2x^2 + p^2x + r^2 = 0$ are the squares of the roots of the equation $qx^2 + px + r = 0$ then q, p, r are in _____.

(a) A.P $\boxed{(b)\ \text{G.P}}$

(c) Both A.P and G.P (d) None of these

12. Graph of a linear equation is a _____.

$\boxed{(a)\ \text{Straight line}}$ (b) Circle

(c) Parabola (d) Hyperbola

13. The number of points of intersection of the quadratic polynomial $x^2 + 4x + 4$ with the X axis is

$(a)\ 0$ $\boxed{(b)\ 1}$ $(c)\ 0\ or\ 1$ $(d)\ 2$

14. For the given matrix $A = \begin{pmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 9 & 11 & 13 & 15 \end{pmatrix}$ the order of the matrix A^T is

$(a)\ 2 \times 3$ $(b)\ 3 \times 2$ $(c)\ 3 \times 4$ $\boxed{(d)\ 4 \times 3}$

15. If A is a 2×3 matrix and B is a 3×4 matrix how many columns does AB have

$(a)\ 3$ $\boxed{(b)\ 4}$ $(c)\ 2$ $(d)\ 5$

16. If number of columns and rows are not equal in a matrix then it is said to be a

(a) Diagonal matrix $\boxed{(b)\ \text{Rectangular matrix}}$

(c) Square matrix (d) Identity matrix

17. Transpose of a column matrix is

(a) Unit matrix (b) Diagonal matrix

(c) Column matrix $\boxed{(d)\ \text{Row matrix}}$

18. Find the matrix X if $2X + \begin{pmatrix} 1 & 3 \\ 5 & 7 \end{pmatrix} = \begin{pmatrix} 5 & 7 \\ 9 & 5 \end{pmatrix}$

$(a)\ \begin{pmatrix} -2 & -2 \\ 2 & -1 \end{pmatrix}$ $\boxed{(b)\ \begin{pmatrix} 2 & 2 \\ 2 & -1 \end{pmatrix}}$

$(c)\ \begin{pmatrix} 1 & 2 \\ 2 & 2 \end{pmatrix}$ $(d)\ \begin{pmatrix} 2 & 1 \\ 2 & 2 \end{pmatrix}$

19. Which of the following can be calculated from the given matrices $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}, B = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$

$(i)\ A^2\ (ii)\ B^2\ (iii)\ AB\ (iv)\ BA$

$(a)\ (i)$ and (ii) only $(b)\ (ii)$ and (iii) only

$\boxed{(c)\ (ii) \text{ and } (iv) \text{ only}}$ (d) All of these

20. If $A = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 0 \\ 2 & -1 \\ 0 & 2 \end{pmatrix}$ and $C = \begin{pmatrix} 0 & 1 \\ -2 & 5 \end{pmatrix}$ which of the following statements are correct?. $(i)\ AB + C = \begin{pmatrix} 5 & 5 \\ 5 & 5 \end{pmatrix}$

$(ii)\ BC = \begin{pmatrix} 0 & 1 \\ 2 & -3 \\ -4 & 10 \end{pmatrix}$ $(iii)\ BA + C = \begin{pmatrix} 2 & 5 \\ 3 & 0 \end{pmatrix}$

$(iv)\ (AB)C = \begin{pmatrix} -8 & 20 \\ -8 & 13 \end{pmatrix}$

$\boxed{(a)\ (i) \text{ and } (ii) \text{ only}}$ $(b)\ (ii)$ and (iii) only

$(c)\ (iii)$ and (iv) only (d) All of these

CHAPTER – 4 (GEOMETRY)

1. If in triangles ABC and EDF, $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar, when

$(a)\ \angle B = \angle E$ $(b)\ \angle A = \angle D$

$\boxed{(c)\ \angle B = \angle D}$ $(d)\ \angle A = \angle F$

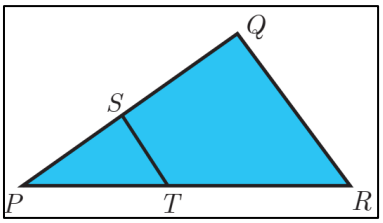
2. In $\Delta LMN, \angle L = 60^\circ, \angle M = 50^\circ$. If $\Delta LMN \sim \Delta PQR$ then the value of $\angle R$ is.

$(a)\ 40^\circ$ $\boxed{(b)\ 70^\circ}$ $(c)\ 30^\circ$ $(d)\ 110^\circ$

3. If ΔABC is an isosceles triangle with $\angle C = 90^\circ$ and $AC = 5\ cm$ then AB is

$(a)\ 2.5\ cm$ $(b)\ 5\ cm$ $(c)\ 10\ cm$ $\boxed{(d)\ 5\sqrt{2}\ cm}$

4. In a given figure $ST \parallel QR, PS = 2\ cm$ and $SQ = 3\ cm$. Then the ratio of the area of ΔPQR to the area of ΔPST is



$(a)\ 25:4$
$(b)\ 25:7$
$(c)\ 25:11$
$(d)\ 25:13$

5. The perimeters of two similar triangles ΔABC and ΔPQR are 36 cm and 24 cm respectively. If $PQ = 10\ cm$, then the length of AB is

$(a)\ 6\frac{2}{3}\ cm$ $(b)\ \frac{10\sqrt{6}}{3}\ cm$ $(c)\ 66\frac{2}{3}\ cm$ $(d)\ 15\ cm$

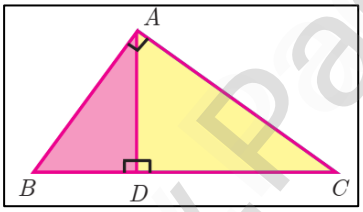
6. If in $\Delta ABC, DE \parallel BC. AB = 3.6\ cm,\ AC = 2.4\ cm$ and $AD = 2.1\ cm$ then the length of AE is

$(a)\ 1.4\ cm$ $(b)\ 1.8\ cm$ $(c)\ 1.2\ cm$ $(d)\ 1.05\ cm$

7. In a ΔABC, AD is the bisector of $\angle BAC$. If $AB = 8\ cm, BD = 6\ cm$ and $DC = 3\ cm$. The length of the side AC is

$(a)\ 6\ cm$ $(b)\ 4\ cm$ $(c)\ 3\ cm$ $(d)\ 8\ cm$

8. In the adjacent figure $\angle BAC = 90^\circ$ and $AD \perp BC$ then

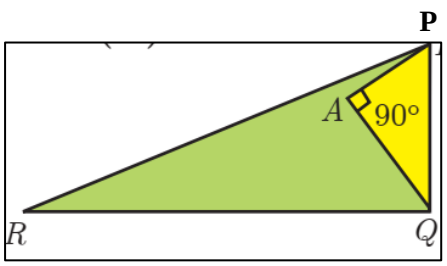


$(a)\ BD.CD = BC^2$
$(b)\ AB.AC = BC^2$
$(c)\ BD.CD = AD^2$
$(d)\ AB.AC = AD^2$

9. Two poles of heights 6 m and 11 m stand vertically on a plane ground. If the distance between their feet is 12 m , what is the distance between their tops?.

$(a)\ 13\ m$ $(b)\ 14\ m$ $(c)\ 15\ m$ $(d)\ 12.8\ m$

10. In the given figure, $PR = 26\ cm,\ QR = 24\ cm, \angle PAQ = 90^\circ,\ PA = 6\ cm$ and $QA = 8\ cm$. Find $\angle PQR$



$(a)\ 80^\circ$
$(b)\ 85^\circ$
$(c)\ 75^\circ$
$(d)\ 90^\circ$

11. A tangent is perpendicular to the radius at the

(a) Centre (b) Point of contact
(c) Infinity (d) Chord

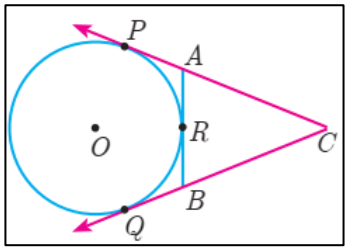
12. How many tangents can be drawn to the circle from an exterior point?.

(a) One (b) Two
(c) Infinite (d) Zero

13. The two tangents from an external points P to a circle with centre at O are PA and PB. If $\angle APB = 70^\circ$ then the value of $\angle AOB$ is

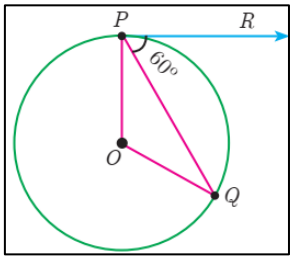
$(a)\ 100^\circ$ $(b)\ 110^\circ$ $(c)\ 120^\circ$ $(d)\ 130^\circ$

14. In figure CP and CQ are tangents to a circle with centre at O. ARB is another tangent touching the circle at R. If $CP = 11\ cm$ and $BC = 7\ cm$, then the length of BR is



$(a)\ 6\ cm$
$(b)\ 6\ cm$
$(c)\ 8\ cm$
$(d)\ 4\ cm$

15. In figure if PR is tangent to the circle at P and O is the centre of the circle, then $\angle POQ$ is



$(a)\ 120^\circ$ $(b)\ 100^\circ$
$(c)\ 110^\circ$ $(d)\ 90^\circ$

CHAPTER – 5 (COORDINATE GEOMETRY)

1. The area of triangle formed by the points $(-5, 0), (0, -5)$ and $(5, 0)$ is.

$(a)\ 0\ sq.units$ $(b)\ 25\ sq.units$
$(c)\ 5\ sq.units$ (d) None of these

2. A man walks near a wall, such that the distance between him and the wall is 10 units. Consider the wall to be the Y axis. The path travelled by the man is

$(a)\ x = 10$ $(b)\ y = 10$
$(c)\ x = 0$ $(d)\ y = 0$

3. The straight line given by the equation $x = 11$ is

   (a) Parallel to X axis **(b) Parallel to Y axis**

   (c) Passing through the origin

   (d) Passing through the point $(0,11)$

4. If $(5,7),(3,p)$ and $(6,6)$ are collinear, then the value of p is

   $(a)\ 3$ $(b)\ 6$ **$(c)\ 9$** $(d)\ 12$

5. The point of intersection of $3x - y = 4$ and $x + y = 8$ is

   $(a)\ (5,3)$ $(b)\ (2.4)$ **$(c)\ (3,5)$** $(d)\ (4,4)$

6. The slope of the line joining $(12,3),(4,a)$ is $\frac{1}{8}$. The vale of 'a' is

   $(a)\ 1$ $(b)\ 4$ $(c)\ -5$ **$(d)\ 2$**

7. The slope of the line which is perpendicular to a line joining the points $(0,0)$ and $(-8,8)$ is

   $(a)\ -1$ **$(b)\ 1$** $(c)\ \frac{1}{3}$ $(d)\ -8$

8. If slope of the line PQ is $\frac{1}{\sqrt{3}}$ then slope of the perpendicular bisector of PQ is

   $(a)\ \sqrt{3}$ **$(b)\ -\sqrt{3}$** $(c)\ \frac{1}{\sqrt{3}}$ $(d)\ 0$

9. If A is a point on the Y axis whose ordinate is 8 and B is a point on the X axis whose abscissae is 5 then the equation of the line AB is

   $(a)\ 8x + 5y = 40$ $(b)\ 8x - 5y = 40$

   $(c) x = 8$ $(d)\ y = 5$

10. The equation of a line passing through the origin and perpendicular to the line $7x - 3y + 4 = 0$ is

    $(a)\ 7x - 3y + 4 = 0$ $(b)\ 3x - 7y + 4 = 0$

    $(c)\ 3x + 7y = 0$ $(d)\ 7x - 3y = 0$

11. Consider four straight lines $(i)\ l_1; 3y = 4x + 5$

    $(ii)\ l_2; 4y = 3x - 1$ $(iii)\ l_3; 4y + 3x = 7$

    $(iv)\ l_4; 4x + 3y = 2$

    Which of the following statement is true?.

    $(a)\ l_1$ and l_2 are perpendicular

    $(b)\ l_1$ and l_4 are parallel

    $(c)\ l_2$ and l_4 are perpendicular

    $(d)\ l_2$ and l_3 are parallel

12. A straight line has equation $8y = 4x + 21$. Which of the following is true

    (a) The slope is 0.5 and the y intercept is 2.6

    (b) The slope is 5 and the y intercept is 1.6

    (c) The slope is 0.5 and the y intercept is 1.6

    (d) The slope is 5 and the y intercept is 2.6

13. When proving that a quadrilateral is a trapezium, it is necessary to show

    (a) Two sides are parallel

    (b) Two parallel and two non – parallel sides

    (c) Opposite sides are parallel

    (d) All sides are of equal length

14. When proving that a quadrilateral is a parallelogram by using slopes you must find

    (a) The slopes of two sides

    (b) The slopes of two pair of opposite sides

    (c) The lengths of all sides

    (d) Both the lengths and slopes of two sides

15. $(2,1)$ is the point of intersection of two lines

    $(a)\ x - y - 3 = 0\ ; 3x - y - 7 = 0$

    $(b)\ x + y = 3;\ 3x + y = 7$

    $(c)\ 3x + y = 3;\ x + y = 7$

    $(d)\ x + 3y - 3 = 0; x - y - 7 = 0$

CHAPTER – 6 (TRIGONOMETRY)

1. The value of $sin^2\theta + \frac{1}{1+tan^2\theta}$ is equal to

   $(a)\ tan^2\theta$ **$(b)1$** $(c)\ cot^2\theta$ $(d)\ 0$

2. $\tan\theta cosec^2\theta - \tan\theta$ is equal to

   $(a)\ \sec\theta$ $(b) cot^2\theta$ $(c)\ \sin\theta$ **$(d)\ \cot\theta$**

3. If $(\sin\alpha + cosec\ \alpha)^2 + (\cos\alpha + sec\ \alpha)^2 = k + tan^2\alpha + cot^2\alpha$, then the value of k is equal to

   $(a)\ 9$ **$(b)\ 7$** $(c)\ 5$ $(d)\ 3$

4. If $\sin\theta + \cos\theta = a$ and $\sec\theta + \text{cosec}\,\theta = b$, then the value of $b(a^2 - 1)$ is equal to

   $(a)\ 2a$ $(b)\ 3a$ $(c)\ 0$ $(d)\ 2ab$

5. If $5x = \sec\theta$ and $\frac{5}{y} = \tan\theta$, then $x^2 - \frac{1}{y^2}$ is equal to

$(a)\ 25$ $\boxed{(b)\ \frac{1}{25}}$ $(c)\ 5$ $(d)\ 1$

6. If $\sin\theta = \cos\theta$, then $2tan^2\theta + sin^2\theta - 1$ is equal to

$(a)\ \frac{-3}{2}$ $\boxed{(b)\ \frac{3}{2}}$ $(c)\ \frac{2}{3}$ $(d)\ \frac{-2}{3}$

7. If $x = a\tan\theta$ and $y = b\sec\theta$ then

$\boxed{(a)\ \frac{y^2}{b^2} - \frac{x^2}{a^2} = 1}$ $(b)\ \frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

$(c)\ \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ $(d)\ \frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$

8. $(1 + \tan\theta + \sec\theta)(1 + \cot\theta - cosec\ \theta)$ is equal to

$(a)\ 0$ $(b)\ 1$ $\boxed{(c)\ 2}$ $(d) - 1$

9. $a\cot\theta + b\ cosec\ \theta = p$ and $b\cot\theta + a\ cosec\ \theta = q$ then $p^2 - q^2$ is equal to

$(a)\ a^2 - b^2$ $\boxed{(b)\ b^2 - a^2}$ $(c)\ a^2 + b^2$ $(d)\ b - a$

10. If the ratio of the height of a tower and the length of its shadow is $\sqrt{3} : 1$, then the angle of elevation of the sun has measure

$(a)\ 45^\circ$ $(b)\ 30^\circ$ $(c)\ 90^\circ$ $\boxed{(d)\ 60^\circ}$

11. The electric pole subtends an angle of 30° at a point on the same level as its foot. At a second point ' b' metres above the first, the depression of the foot of the pole is 60°. The height of the pole (in metres) is equal to

$(a)\ \sqrt{3}\ b$ $\boxed{(b)\ \frac{b}{3}}$ $(c)\ \frac{b}{2}$ $(d)\ \frac{b}{\sqrt{3}}$

12. A tower is 60 m heigh. Its shadow reduces by x metres when the angle of elevation of the sun increases from 30° to 45° then x is equal to

$(a)\ 41.92\ m$ $\boxed{(b)\ 43.92\ m}$ $(c)\ 43\ m$ $(d) 45.6\ m$

13. The angle of depression of the top and bottom of 20 m tall building from the top of a multistoried building are 30° and 60° respectively. The height of the multistoried building and the distance between two building (in metres) is

$(a)\ 20, 10\sqrt{3}$ $(b)\ 30, 5\sqrt{3}$ $(c)\ 20,10$ $\boxed{(d)\ 30,10\sqrt{3}}$

14. Two persons are standing 'x' metres apart from each other and the height of the first person is double that of the other. If from the middle point of the line joining their feet an observer finds the angular elevations of their tops to be complementary, then the height of the shorter person (in metres) is

$(a)\ \sqrt{2}\ x$ $\boxed{(b)\ \frac{x}{2\sqrt{2}}}$ $(c)\ \frac{x}{\sqrt{2}}$ $(d)\ 2x$

15. The angle of elevation of a cloud from a point h metres above a lake is β . The angle of depression of its reflection in the lake is 45°. The height of location of the cloud from the lake is

$\boxed{(a)\ \frac{h(1+\tan\beta)}{1-\tan\beta}}$ $(b)\ \frac{h(1-\tan\beta)}{1+\tan\beta}$

$(c)\ h\tan(45^\circ - \beta)$ (d) None of these

CHAPTER – 7 (MENSURATION)

1. The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is

$(a)\ 60\pi\ cm^2$ $(b)\ 68\pi\ cm^2$

$(c)\ 120\pi\ cm^2$ $\boxed{(d)\ 136\pi\ cm^2}$

2. If two solid hemispheres of same base radius r units are joined together along their bases, then curved surface area of this new solid is

$\boxed{(a)\ 4\pi r^2}$ sq. units $(b)\ 6\pi r^2$ sq. units

$(c)\ 3\pi r^2$ sq. units $(d)\ 8\pi r^2$ sq. units

3. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be

$\boxed{(a)\ 12\ cm}$ $(b)\ 10\ cm$ $(c)\ 13\ cm$ $(d)\ 5\ cm$

4. If the radius of the base of a right circular cylinder is halved keeping the same height, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is

$(a)\ 1:2$ $\boxed{(b)\ 1:4}$ $(c)\ 1:6$ $(d) 1:8$

5. The total surface area of a cylinder whose radius is $\frac{1}{3}$ of its height is

$(a)\ \frac{9\pi h^2}{8}$ sq. units $(b)\ 24\pi h^2$ sq. units

$(c)\ \frac{8\pi h^2}{9}$ sq. units $(d)\ \frac{56\pi h^2}{9}$ sq. units

6. In a hollow cylinder, the sum of the external and internal radii is 14 cm and the width is 4 cm. If its height is 20 cm, the volume of the material in it is
   $(a)\ 5600\pi\ cm^3$ $(b)\ 1120\pi\ cm^3$
   $(c)\ 56\pi\ cm^3$ $(d)\ 3600\pi\ cm^3$
7. If the radius of the base of a cone is tripled and the height is doubled then the volume is
   (a) Made 6 times (b) Made 18 times
   (c) Made 12 times (d) Unchanged
8. The total surface area of a hemi – sphere is how much times the square of its radius.
   $(a)\ \pi$ $(b)\ 4\pi$ $(c)\ 3\pi$ $(d)\ 2\pi$
9. A solid sphere of radius x cm is melted and cast into a shape of a solid cone of same radius. The height of the cone is
   $(a)\ 3x\ cm$ $(b)\ x\ cm$ $(c)\ 4x\ cm$ $(d) 2x\ cm$
10. A frustrum of a right circular cone is of height 16 cm with radii of its as 8 cm and 20 cm. Then, the volume of the frustrum is
    $(a)\ 3328\pi\ cm^3$ $(b)\ 3228\pi\ cm^3$
    $(c)\ 3240\pi\ cm^3$ $(d)\ 3340\pi\ cm^3$
11. A shuttle cock used for playing badminton has the shape of the combination of
    (a) A cylinder and a sphere
    (b) A hemisphere and a cone
    (c) A sphere and a cone
    (d) Frustrum of a cone and a hemisphere
12. A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r_2 units. Then $r_1 : r_2$ is
    $(a)\ 2:1$ $(b)\ 1:2$ $(c)\ 4:1$ $(d)\ 1:4$
13. The volume (in cm^3) of the greatest sphere that can be cut off from a cylindrical log of wood of base radius 1 cm and height 5 cm is
    $(a)\ \frac{4}{3}\pi$ $(b)\ \frac{10}{3}\pi$ $(c)\ 5\pi$ $(d)\ \frac{20}{3}\pi$
14. The height and radius of the cone of which the frustrum is a part are h_1 units and r_1 units respectively. Height of the frustrum is h_2 units and radius of the smaller base is r_2 units. If $h_2 : h_1 = 1:2$ then $r_2 : r_1$ is
    $(a)\ 1:3$ $(b)\ 1:2$ $(c)\ 2:1$ $(d)\ 3:1$
15. The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height is
    $(a)\ 1:2:3$ $(b)\ 2:1:3$
    $(c)\ 1:3:2$ $(d)\ 3:1:2$

CHAPTER – 8 (STATISTICS ANDPROBABILITY)

1. Which of the following is not a measure of dispersion?.
   (a) Range (b) Standard deviation
   (c) Arithmetic Mean (d) Variance
2. The range of the data $8, 8, 8, 8, \ldots 8$ is
   $(a)\ 0$ $(b)\ 1$ $(c)\ 8$ $(d)\ 3$
3. The sum of all deviations of the data from its mean is
   (a) Always positive (b) Always negative
   (c) Zero (d) Non – Zero integer
4. The mean of 100 observations is 40 and their standard deviation is 3. The sum of squares of all observations is
   $(a)\ 40000$ $(b)\ 160900$ $(c)\ 160000$ $(d)\ 30000$
5. Variance of first 20 natural numbers is
   $(a)\ 32.25$ $(b)\ 44.25$ $(c)\ 33.25$ $(d)\ 30$
6. The standard deviation of a data is 3. If each value is multiplied by 5 then the new variance is
   $(a)\ 3$ $(b)\ 15$ $(c)\ 5$ $(d)\ 225$
7. If the standard deviation of x, y, z is p then the standard deviation of $3x+5, 3y+5, 3z+5$ is
   $(a)\ 3p+5$ $(b)\ 3p$ $(c)\ p+5$ $(d)\ 9p+15$
8. If the mean and coefficient of variation of a data are 4 and 87.5 % then the standard deviation is
   $(a)\ 3.5$ $(b)\ 3$ $(c)\ 4.5$ $(d)\ 2.5$

9. Which of the following is incorrect?.

   $\boxed{(a)\ P(A) > 1}$ $(b)\ 0 \le P(A) \le 1$

   $(c)\ P(\phi) = 0$ $(d)\ P(A) + P(\bar{A}) = 1$

10. The probability a red marble selected at random from a jar containing p red, q blue and r green marbles is

    $(a)\ \frac{q}{p+q+r}$ $\boxed{(b)\ \frac{p}{p+q+r}}$ $(c)\ \frac{p+q}{p+q+r}$ $(d)\ \frac{p+r}{p+q+r}$

11. A page is selected at random from a book. The probability that the digit at units place of the page number chosen is less than 7 is

    $(a)\ \frac{3}{10}$ $\boxed{(b)\ \frac{7}{10}}$ $(c)\ \frac{3}{9}$ $(d)\ \frac{7}{9}$

12. The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is

    $(a)\ 2$ $\boxed{(b)\ 1}$ $(c)\ 3$ $(d)\ 1.5$

13. Kamalan went to play a lucky draw contest. 135 tickets of the lucky draw were sold. If the probability of Kamalan winning is $\frac{1}{9}$, then the number of tickets bought by Kamalan is

    $(a)\ 5$ $(b)\ 10$ $\boxed{(c)\ 15}$ $(d)\ 20$

14. If a letter is chosen at random from the English alphabets $\{a, b, \ldots z\}$, then the probability that the letter chosen precedes x

    $(a)\ \frac{12}{13}$ $(b)\ \frac{1}{13}$ $\boxed{(c)\ \frac{23}{26}}$ $(d)\ \frac{3}{26}$

15. A purse contains 10 notes of ₹ 2000, 15 notes of ₹ 500, and 25 notes of ₹ 200. One note is drawn at random. What is the probability that the note is either a ₹ 500 note or ₹ 200 note?

    $(a)\ \frac{1}{5}$ $(b)\ \frac{3}{10}$ $(c)\ \frac{2}{3}$ $\boxed{(d)\ \frac{4}{5}}$

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PG – TEACHER

All the best Students

ROUGH WORK

10 MATHS PROGRESS CHECK SOLUTION

CHAPTER – 1 (RELATIONS AND FUNCTIONS)

1. For any two non-empty sets A and B $A \times B$ is called as **Cartesian Product**.
2. If $n(A \times B) = 20$ and $n(A) = 5$, then $n(B)$ is **4**.
3. If $A = \{-1, 1\}$ and $B = \{-1, 1\}$ then Geometrically describe the set of points of $A \times B$ $\{(-1,-1), (-1,1), (1,-1), (1,1)\}$.
4. If A, B are the line Segments given by the intervals $\{-4, 3\}$ and $\{-2, 3\}$ respectively, represent the cartesian product of A and B $\{(-4,-2), (-4,3), (3,-2), (3,3)\}$.
5. Let $A = \{1, 2, 3, 4\}$ and $B = \{a, b, c\}$.

1.Which of the following are relations from A to B?.	2.Which of the following are relations from B to A?.
(i) $\{(1,b), (1,c), (3,a), (4,b)\}$	(i) $\{(c,a), (c,b), (c,1)\}$
(ii) $\{(1,a), (b,4), (c,3)\}$	(ii) $\{(c,1), (c,2), (c,3), (c,4)\}$
(iii) $\{(1,a), (a,1), (2,b), (b,2)\}$	(iii) $\{(a,4), (b,3), (c,2)\}$

6. Relations are subsets of **Cartesian Product** Functions are Subsets of **Relations**.
7. True or False: All the elements of a relation should have images. **False**
8. True or False: All the elements of a Function should have images. **True**
9. True or False: If $R: A \to B$ is a relation then the domain of R = A. **False**
10. If $f: \mathbb{N} \to \mathbb{N}$ is defined as $f(x) = x^2$ the image of 1 and 2 are **1** and **No Pre image**.
11. What is the difference between relation and function?. **When every input has unique output is Function, otherwise Relation.**
12. Let A and B be two non-empty finite sets. Then which one among the following two collection is large?.

    (i)The number of relation between A and B.

    Large

    (ii)The number of Function between A and B.

    Small
13. **State True or False:**

    (i) All one-one function are onto function.

    False

    (ii) There will be no one-one function from A to B when $n(A) = 4, n(B) = 3$. **True**

    (iii) All onto Functions are one-one function.

    False

    (iv) There will be no onto function from A to B when $n(A) = 4, n(B) = 5$. **True**

    (v) If f is a bijection from A to B, then $n(A) = n(B)$. **True**

    (vi) If $n(A) = n(B)$, then f is a bijection from A to B. **False**

    (vii) All constant functions are bijections. **False**
14. Composition of functions is commutative.

    (a) Always True (b) Never true

    (c) Sometimes true
15. Composition of function is Associative.

    (a) Always True (b) Never true

    (c) Sometimes true
16. Is a constant function a linear Function?. **Yes**
17. Is quadratic function a one-one Function?. **No**
18. Is Cubic Function a one-one Function?. **Yes**
19. Is the reciprocal Function a Bijection?. **Yes**
20. If $f: A \to B$ is a constant function, then the range of f will have **Only One** element.

CHAPTER – 2 (NUMBERS AND SEQUENCES)

1. Find q and r for the following pairs of integers a and b satisfying $a = bq + r$.

$a = 13, \quad b = 3$	$q = 4, \quad r = 1$
$a = 18, \quad b = 4$	$q = 4, \quad r = 2$
$a = 21, \quad b = -4$	$q = -5, \quad r = 1$
$a = -32, \quad b = -12$	$q = 3, \quad r = 4$
$a = -31, \quad b = 7$	$q = -5, \quad r = 4$

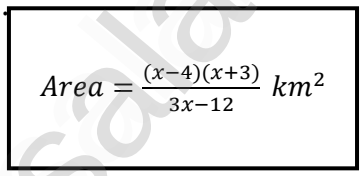
2. Euclid's division algorithm is a repeated application lemma until we get remainder as **Zero**.
3. The HCF of two equal positive integer k, k is **K(Same integer)**.
4. Every natural number except **One** can be expressed as **Prime Factors**.
5. In how many ways a composite number can be written as product of power of primes?. **Only One way**
6. The number of divisors of any prime number is **Only 2**.
7. Let m divides n. Then GCD and LCM of m, n are $\boldsymbol{m}$ and $\boldsymbol{n}$.
8. The HCF of numbers of the form 2^m and 3^n is **1**.
9. Two integers a and b are Congruent modulo n if $\frac{(a-b)}{n}$.
10. The set of all positive integers which leave remainder 5 when divided by 7 are **5, 12, 19 ,…**.
11. The positive values of k such that $(k-3) \equiv 5(mod\ 11)$ are **8, 19, 30 ,…**
12. If $59 \equiv 3(mod\ 7), 49 \equiv 4(mod\ 7)$ then $105 \equiv \mathbf{0}(mod\ 7),\ 13 \equiv \mathbf{6}(mod\ 7), 413 \equiv \mathbf{0}(mod\ 7),\ 368 \equiv \mathbf{4}(mod\ 7)$.
13. The remainder when $7 \times 13 \times 19 \times 23 \times 29 \times 31$ is divided by 6 is **1**.
14. Fill in the blanks for the following sequences
    (i) $7, 13, 19, \mathbf{25}, \mathbf{31}$ … (ii)$2, \mathbf{5}10, 17,26,$ ...
    (iii) $1000,100,10,1, \mathbf{0.1}, \mathbf{0.01}$ ...
15. A sequences is a function defined on the set of **Natural Numbers**.
16. The n^{th} term of the sequence 0,2,6,12,20, ... can be expressed as $\boldsymbol{n(n-1)}$.
17. **Say True or False:**
    (i) All sequences are functions. **True**
    (ii) All functions are sequences. **False**
18. The difference between any two consecutive terms of an A.P is **d – common difference**.
19. If a and d are the first term and common difference of an A.P, then the 8^{th} term is $\boldsymbol{t_8 = a + 7d}$..
20. If t_n is the n^{th} term of an A.P, then $t_{2n} - t_n$ is $\boldsymbol{nd}$.
21. The common difference of a constant A.P is **Zero**.
22. If a and l are first and last terms of an A.P then the number of terms is $\boldsymbol{n = \frac{(l-a)}{d} + 1}$..
23. If every terms of an A.P is multiplied by 3, then the common difference of the new A.P is $\boldsymbol{3d}$.
24. Three numbers a, b and c will be in A.P If and only if $\boldsymbol{2b = a + c}$.
25. The sum of terms of a sequence is called **Series**.
26. If a series have finite number of terms then it is called **Finite Series**.
27. A series whose terms are in **A.P Sequence** is called Arithmetic Series.
28. If the first and last terms of an A.P are given then the formula to find the sum is $\boldsymbol{S_n = \frac{n}{2}(a + l)}$.
29. **State True or False:**
(i) The n^{th} term of any A.P is of the form $pn + q$ where p and q are some constants. **True**
(ii) The sum to n^{th}term of any A.P is of the form $pn^2 + qn + r$ where p, q, r are some constants. **True**
30. A G.P is obtained by multiplying **a fixed non – zero number** to the preceding term.
31. The ratio between any two consecutive terms of the G.P is **Always constant** and it is called **Common ratio**.
32. Fill in the blanks if the following are in G.P
$(i)\frac{1}{8}, \frac{3}{4}, \frac{9}{2}, \mathbf{27}$ $(ii)7, \frac{7}{2}, \frac{7}{4}$ $(iii)\ \mathbf{2}, 2\sqrt{2}, 4,..$
33. If first term $= a$, common ratio $= r$, then find the value of t_9 and t_{27}. $\boldsymbol{t_9 = ar^8,\ t_{27} = ar^{26}}$

34. In a G.P if $t_1 = \frac{1}{5}$ and $t_2 = \frac{1}{25}$ then the common ratio is $\mathbf{\frac{1}{5}}$.
35. Three non-zero numbers a, b, c are in G.P if and only if $\mathbf{b^2 = ac}$. Or $\mathbf{\frac{b}{a} = \frac{c}{b}}$
36. A series whose terms are in Geometric progression is called. **Geometric Series**
37. When $r = 1$ the formula for finding sum to n terms of a G.P is $\mathbf{na.}$
38. When $r \neq 1$ the formula for finding sum to n terms of a G.P is $\mathbf{S_n = \frac{a(r^n-1)}{r-1}, r > 1}$,
    $\mathbf{S_n = \frac{a(1-r^n)}{1-r}, r < 1.}$
39. Sum to infinite number of terms of a G.P is $\mathbf{\frac{a}{1-r}}$.
40. For what values of r does the formula for infinite G.P valid?. $\mathbf{r < 1}$
41. Is the series $3 + 33 + 333 + \cdots$ a Geometric series?. **No**
42. The value of r, such that $1 + r + r^2 + r^3 \ldots = \frac{3}{4}$ is $\mathbf{r = -\frac{1}{3}}$.
43. The sum of cubes of first n natural numbers is **Square** of the first n natural numbers.
44. The Average of first 100 natural numbers is **50.5**.
45. Say True or False:
    1.The sum of first n odd natural numbers is always an odd number.. **False**
    2.The sum of consecutive even numbers is always an even number. **True**
    3.The difference between the sum of squares of first n natural numbers and the sum of first n natural numbers is always divisible by 2. **True**
    4.The sum of cubes of the first n natural numbers is always a square number. **True**

CHAPTER – 3 (ALGEBRA)

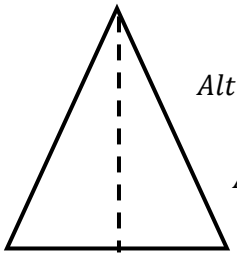
1. For a system of linear equations in three variables the minimum number of equations required to get unique solution is **Three**.
2. A system with **Infinitely Many Solution** will reduce to identity.
3. A system with **No Solution** will provide absurd equation.
4. When two polynomials of same degree has to be divided **Polynomial with Highest coefficient** should be considered to fix the dividend and divisor.
5. If $r(x) = 0$ when $f(x)$ is divided by $g(x)$ is called **divisor** of the polynomials.
6. If $f(x) = g(x)q(x) + r(x)$ $\quad -\boldsymbol{r(x)}$ must be added to $f(x)$ completely divisible by $g(x)$.
7. If $f(x) = g(x)q(x) + r(x)$ $\quad \boldsymbol{r(x)}$ must be subtracted to $f(x)$ completely divisible by $g(x)$.
8. Find the unknown expression in the following figures.

1.

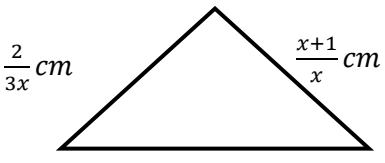


$breadth = \mathbf{\frac{(x+3)}{x-3}\ km}$

2.

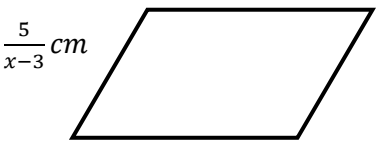


9. Write an expression that represents the perimeter of the figure and simplify.



$\mathbf{Ans}: \mathbf{\frac{3x^2+5x+6}{3x^2}}$

10. Find the base of the given parallelogram whose perimeter is $\frac{4x^2+10x-50}{(x-3)(x+5)}$.

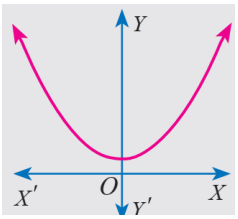
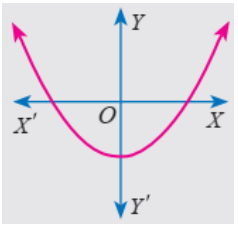
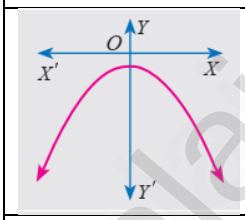
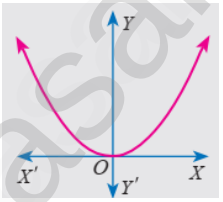
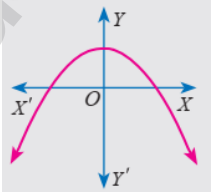
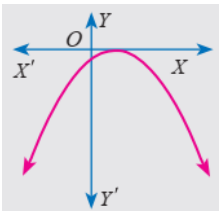


$\mathbf{Ans}: \mathbf{\frac{2(x-5)}{x-3}}$

11. Is $x^2 + 4x + 4$ a perfect square?. **Yes**
12. What is the value of x in $3\sqrt{x} = 9$?. $\boldsymbol{x = 9}$.
13. The square root of $361x^4y^2$ is $\boldsymbol{19x^2y}$.
14. $\sqrt{a^2x^2 + 2abx + b^2} = \ |\boldsymbol{ax + b}|$.
15. If a polynomial is a perfect square then its factors will be repeated **Even** number of times (odd/even).
16.

Conclusion	Sum $= -\frac{b}{a}$ Product $= \frac{c}{a}$	Sum $= -\frac{b}{a}$ Product $= \frac{c}{a}$	Sum $= -\frac{b}{a}$ Product $= \frac{c}{a}$
$\frac{c}{a}$	$\frac{1}{2}$	$\frac{16}{25}$	$\frac{-27}{2}$
$-\frac{b}{a}$	$\frac{9}{4}$	$\frac{8}{5}$	$\frac{15}{2}$
Product of roots $\alpha\beta$	$\frac{1}{2}$	$\frac{16}{25}$	$\frac{-27}{2}$
Sum of Roots $\alpha + \beta$	$\frac{9}{4}$	$\frac{8}{5}$	$\frac{15}{2}$
Co-efficient of x^2, x and constant	$4, -9, 2$	$25, -40, 16$	$2, -15, -27$
Roots of quadratic equation α and β	$(2, \frac{1}{4})$	$(\frac{4}{5}, \frac{4}{5})$	$(9, -\frac{3}{2})$
Quadratic Equation	$4x^2 - 9x + 2 = 0$	$\left(x - \frac{4}{5}\right)^2 = 0$	$2x^2 - 15x - 27 = 0$

17.

Graphs	No. of Points of Intersection with X-axis	No. of Solution
	**0**	**No real roots**
	**2**	**Real and unequal roots**
	**0**	**No real roots**
	**1**	**Real and equal roots**
	**2**	**Real and unequal roots**
	**1**	**Real and equal roots**

18. Find the element second row and third column of the matrix $\begin{pmatrix} 1 & -2 & 3 \\ 2 & 1 & 5 \end{pmatrix}$. **5**
19. Find the order of the matrix. $\begin{pmatrix} \sin\theta \\ \cos\theta \\ \tan\theta \end{pmatrix}$. **3 × 1**
20. Determine the entries denoted by $a_{11}, a_{22}, a_{33}, a_{44}$ from the matrix $\begin{pmatrix} 2 & 1 & 3 & 4 \\ 5 & 9 & -4 & \sqrt{7} \\ 3 & \frac{5}{2} & 8 & 9 \\ 7 & 0 & 1 & 4 \end{pmatrix}$. **2, 9, 8, 4**

21. The number of column(s) in a column matrix are **One**.
22. The number of row(s) in a row matrix are **One**.
23. The non-diagonal elements in any unit matrix are **Zero**.
24. Does there exist a square matrix with 32 elements?.

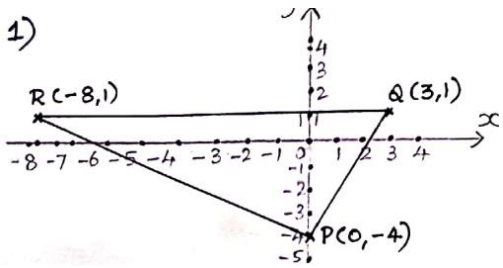
Not Possible $m \times n$ must be Square number

CHAPTER – 4 (GEOMETRY)

1. All circles are **Similar** (congruent/similar).
2. All squares are **Similar** (Similar/Congruent).
3. Two triangles are similar, if their corresponding angles are **Equal** and their corresponding sides are **Proportional**.
4. **Say True or False:**
   (i) All similar triangles are congruent. **False**
   (ii) All congruent triangles are similar. **True**
5. Give two different examples of pair of non-similar figures?. **Square – Rhombus , Rectangle - Parallelogram**
6. A straight line drawn **Parallel** to a side of a triangle divides the other two sides Proportionally?.
7. Basic Proportionality Theorem is also known as **Thales Theorem**.
8. Let ΔABC be equilateral. If D is a point on BC and AD is the internal bisector of $\angle A$. Using Angle Bisector Theorem, $\frac{BD}{DC}$ is **1**.
9. The **Internal bisector** of an angle of a triangle divides the opposite side internally in the ratio of the corresponding sides containing the angle.
10. If the median AD to the side of a ΔABC is also an angle bisector of $\angle A$ then $\frac{AB}{AC}$ is **1**.
11. **Hypotenuse** is the longest side of the right angled triangle.
12. The first theorem in mathematics is **Pythagoras Theorem**.
13. If the square of the longest side of a triangle is equal to sums of squares of other two sides , then the triangle is **Right angled triangle**.
14. **State True or False:**
    (i) Pythagoras Theorem is applicable to all triangles. **False**
    (ii) One side of a right angled triangle must always be a multiple of 4. **True**
15. A straight line that touches a circle at a common point is called a **Tangent**.
16. A chord is a subsection of **Secant**.
17. The lengths of the two tangents drawn from **An Exterior** point to a circle are equal.
18. No tangent can be drawn from **Inside** of the circle.
19. **Angle bisector** is a cevian that divides the angle, into two equal halves.

CHAPTER – 5 (COORDINATE GEOMETRY)

1. The vertices of ΔPQR are $P(0,-4), Q(3,1)$ and $R(-8,1)$.
   (i) Draw ΔPQR on a graph paper.



   (ii) Check if ΔPQR is equilateral. **No**
   (iii) Find the area of ΔPQR. **27.5 sq.cm**
   (iv) Find the coordinates of M, the mid-point of QP. $\boldsymbol{M}(\frac{3}{2}, -\frac{3}{2})$
   (v) Find the coordinates of N, the mid-point of QR. $\boldsymbol{N}(-\frac{5}{2}, 1)$
   (vi) Find the area of ΔMPN. **6.875 sq.cm**
   (vii) What is the ratio between the areas of ΔMPN and ΔPQR?. **1 : 4**

2. Given a quadrilateral ABCD with vertices

$A(-3,-8), B(6,-6), C(4,2), D(-8,2)$

(i) Find the area of ΔABC. **38 sq.cm**

(ii) Find the area of ΔACD. **60 sq.cm**

(iii) Calculate area of ΔABC + area of ΔACD.

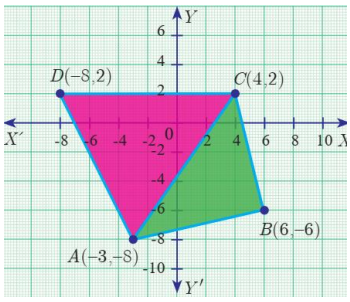
98 sq.cm

(iv) Find the area of quadrilateral ABCD.

98 sq.cm

(v) Compare the answers obtained in 3 and 4.

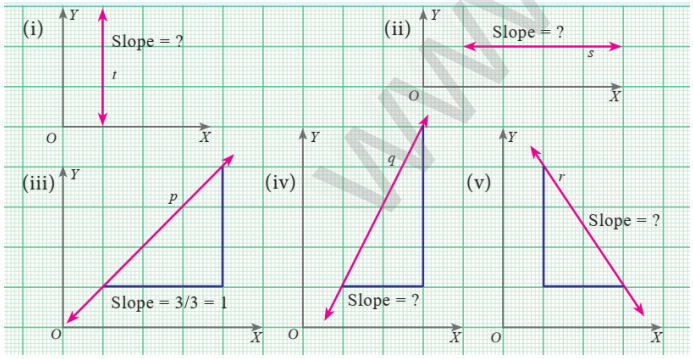
Both are Same



3. Fill in the missing boxes.

S. No	Points	Slope
1.	$A(-a,b), B(3a,-b)$	$-\frac{b}{2a}$
2.	$A(2,3), B(2,3)$	2
3.	**X axis parallel to X axis**	0
4.	**Y axis parallel to Y axis**	Undefined

4. Write down the slope of each of the lines shows on the grid below.



Ans: **(i) slope $m = \tan 90°$ (Undefined)**
(ii)slope $m = \tan 0° = 0$
(iii)slope $m = \frac{3}{3} = 1$
(iv)slope $m = \frac{4}{2} = 1$
(v)slope $m = -\frac{3}{2}$

5. Fill in the details in respective boxes.

Form	When to use?	Name
$y = mx + c$	m = slope, c = Intercept	**Slope - Intercept form**
$\frac{y-y_1}{y_2-y_1} = \frac{x-x_1}{x_2-x_1}$	**Two Points**	**Two Point form**
$\frac{x}{a}+\frac{y}{b}=1$	The intercept given	Intercept Form

6. $A(0,5), B(5,0)$ and $C(-4,-7)$ are vertices of a triangle then its centroid will be at $\boldsymbol{G\left(\frac{1}{3},-\frac{2}{3}\right)}$

7. Fill in the represent boxes

External	Ratio		2:3	**1:7**
	Point		$\left(\frac{1}{5},\frac{-2}{5}\right)$	$(-13,15)$
Internal	Ratio		2:3	**2:1**
	Point		$\left(\frac{19}{5},\frac{22}{5}\right)$	$(-\frac{13}{3},5)$
Mid Point			$\left(\frac{9}{4},\frac{9}{2}\right)$	$(-5,7)$
Distance			$\sqrt{5}$ **Units**	$\sqrt{4^2+10^2}$ **Units**
Points			$(3,4),(5,5)$	$(-7,13),(-3,1)$
S. No			1.	2.

8. Fill in the detail in respective boxes.

Equation	Slope	x intercept	y intercept
$3x - 4y + 2 = 0$	**0**	$-\frac{2}{3}$	$\frac{1}{2}$
$y = 14x$	**14**	**0**	0
$3x - 2y - 6 = 0$	$\frac{3}{2}$	2	-3

9. Fill in the detail in respective boxes.

Equation	Parallel or Perpendicular
$5x + 2y + 5 = 0$ $5x + 2y - 3 = 0$	**Parallel**
$3x - 7y - 6 = 0$ $7x + 3y + 8 = 0$	**Perpendicular**
$8x - 10y + 11 = 0$ $4x - 5y + 16 = 0$	**Parallel**
$2y - 9x - 7 = 0$ $27y + 6x - 21 = 0$	**Perpendicular**

CHAPTER – 6 (TRIGONOMETRY)

1. The number of trigonometric ratios is **Six**.
2. $1 - cos^2\theta$ is $\boldsymbol{sin^2\theta}$.
3. $(\sec\theta + \tan\theta)(\sec\theta - \tan\theta)$ is **1**.
4. $(\cot\theta + \operatorname{cosec}\theta)(\cot\theta - \operatorname{cosec}\theta)$ is $-\mathbf{1}$.
5. $\cos 60^\circ \sin 30^\circ + \cos 30^\circ \sin 60^\circ$ is **1**.
6. $\tan 60^\circ \cos 60^\circ + \cot 60^\circ \sin 60^\circ$ is **1**.
7. $(\tan 45^\circ + \cot 45^\circ) + (\sec 45^\circ \operatorname{cosec}\ 45^\circ$ is **4**.
8. $\sec\theta = cosec\ \theta$ if θ is $\mathbf{45^\circ}$.
9. $\cot\theta = \tan\theta$ if θ is $\mathbf{45^\circ}$.
10. The line drawn from the eye of an observer to the point of object is **Line of sight**.
11. Which instrument is used in measuring the angle between an object and the eye of the observer ?.
    Clinometer
12. When the line of sight is above the horizontal level, the angle formed is **Angle of Elevation**.
13. The angle of elevation **Increases** as we move towards the foot of the vertical object (tower).
14. When the line of sight is below the horizontal level, the angle formed is **Angle of depression**.

CHAPTER – 7 (MENSURATION)

1. Right circular cylinder is a solid obtained by revolving **Rectangle** about **its sides**.
2. In a right circular cylinder the axis is **Perpendicular** to the diameter.
3. The difference between the C.S.A and T.S.A of a right circular cylinder is $\boldsymbol{2\pi r^2}$.
4. The C.S.A of a right circular cylinder of equal radius and height is **Twice** the area of its base.
5. Right circular cone is a solid obtained by revolving **Right angled triangle** about **Sides Containing $\mathbf{90^\circ}$**.
6. In a right circular cone the axis is **Perpendicular** to the diameter.
7. The difference between the C.S.A and T.S.A of a right circular cone is $\boldsymbol{\pi r^2}$.
8. When a sector of a circle is transformed to form a cone, then Match it: Sector and Cone

Sector	Cone
Radius	**Slant height**
Area	**C.S.A**
Arc Length	**Circumference of the base**

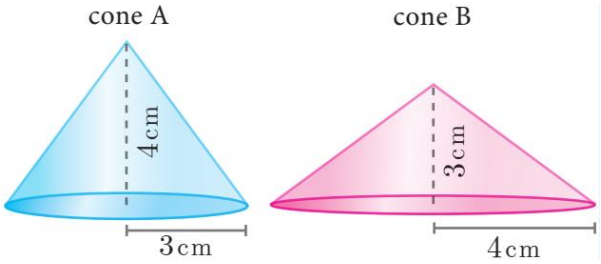
9. Every section of a sphere by a plane is a **Circle**.
10. The centre of a great circle is at the **Centre** of the sphere.
11. The difference between the T.S.A and C.S.A of hemisphere is $\boldsymbol{\pi r^2}$.
12. The ratio of surface area of a sphere and C.S.A of hemisphere is **2 : 1** .
13. A section of the sphere by a plane through any of its great circle is **Hemisphere**.
14. The portion of a right circular cone intersected between two parallel planes is **Frustum of a cone.**
15. How many frustrum can a right circular cone have?
    Infinitely Many.

16. Volume of a cone is the product of its base area and **One Third of its height**.
17. If the radius of the cone is doubled the new volume will be **Four** times the original Volume.
18. Consider the Cones given :

(i) Without doing any calculation find out whose volume is Grater?. **Cone B**

(ii) Verify whether the cone with greater volume has greater surface area. **Yes** ($\mathbf{15\pi}$, $\mathbf{20\pi}$)

(iii) Volume of cone A : Volume of cone B = ?. **3 : 4**



19. What is the ratio of volume to surface area of a sphere?. $\boldsymbol{r : 3}$
20. The relationship between the height and radius of the hemisphere is **Equal.**
21. The volume of a sphere is the product of its surface area and **One third of its radius**.

CHAPTER – 8 (STATISTICS AND PROBABILITY)

1. The sum of all the observations divided by number of observations is **Mean .**
2. If the sum of 10 data values is 265 then their mean is **26.5.**
3. If the sum and mean of a data are 407 and 11 respectively. Then the number of observations in the data are **37.**
4. The range of first 10 prime numbers is **27(29-2=27).**
5. If the variance is 0.49 then the standard deviation is **0.7**.
6. Coefficient of variation is a relative measure of **Standard deviation**.
7. When the standard deviation is divided by the mean we get **Coefficient of variation**.
8. The coefficient of variation depends upon **Mean** and **S.D**.
9. If the mean and standard deviation of a data are 8 and 2 respectively then the coefficient of variation is **25 %.**
10. When comparing two data, the data with **Larger** coefficient of variation is inconsistent.
11. An experiment in which a particular outcome cannot be predicted is called **Random**.
12. The set of all possible outcomes is called **Sample Space.**
13. Which of the following values cannot be a probability of an event?.

$(\boldsymbol{a}) \mathbf{-0.0001}$ (b) 0.5 $(\boldsymbol{c}) \mathbf{1.001}$ (d) 1

(e) 20 % (f) 0.253 $(\boldsymbol{g})$ $\frac{1-\sqrt{5}}{2}$ (h) $\frac{\sqrt{3}+1}{4}$

b), d), e), f), h) can be Probability of an Event.

14. P(only A) = $\boldsymbol{P(A \cap \bar{B})}$.
15. $P(\bar{A} \cap B)$ = P (only B).
16. $A \cap B$ and $\bar{A} \cap B$ are **Mutually exclusive** events.
17. $P(\bar{A} \cap \bar{B}) = \boldsymbol{P(\overline{A \cup B})}$.**De Margon Law**
18. If A and B are mutually exclusive events then $P(A \cap B) = \mathbf{0}$.
19. If $P(A \cap B) = 0.3, P(\bar{A} \cap B) = 0.45$ then $\boldsymbol{P(B) = 0.75}$.

***

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PG - TEACHER

" BELIEVE IN YOURSELF

UNDERSTAND IN YOURSELF

DEVELOPE IN YOURSELF "