10th MATHS QR CODE QUESTIONS - BOOK NEW SYLLABUS EM (2024-2025)

CHAPTER – 1 (RELATIONS AND FUNCTIONS)

1. If $f : R \to R$ defined by $f(x) = x^2 + 2$, then the pre-images of 27 are

   (A) $5, -5$ (B) $\sqrt{5}, -\sqrt{5}$ (C) 5, 0 (D) 0,5

2. If $f(x - \frac{1}{x}) = x^2 + \frac{1}{x^2}$, then $f(x) =$_____.

   (A) $x^2 + 2$ (B) $x^2 - 2$ (C) $x^2 + \frac{1}{x^2}$ (D) $x^2 - \frac{1}{x^2}$

3. $If A = \{a, b, c\}$, $B = \{2,3\}$ and $C = \{a, b, c, d\}$ then $n[(A \cap C) \times B]$ is

   (A) 4 (B) 8 (C) 6 (D) 12

4. If the ordered pairs $(a, 1)$ and $(5, b)$ belong to $\{(x, y)/y = 2x + 3\}$, then the values of a and b are

   (A) $-13,2$ (B) 2, 13 (C) $2, -13$ (D) $-2,13$

5. The function $f : M \to M$ is defined by $f(x) = 2x$. Then the function f is

   (A) Not one-one but onto (B) one-one but not onto

   (C) one-one and onto (D) not one-one and not onto

6. If $f(x) = \{x + 1\}$, then $f(f(f(y + 2)))$ is

   (A) $y + 3$ (B) $y + 5$ (C) $y + 7$ (D) $y + 9$

7. The function r which maps temperature in degree Celsius into temperature in degree Fahrenheit is defined by $t(c) = \frac{9c}{5} + 32$. The Fahrenheit degree is 95 then the value of c will be

   (A) 37 (B) 36 (C) 35 (D) 29

8. If $f(x) = \{mx + n\}$ where m and n are integers, $f(-2) = 7$ and $f(3) = 2$ then m and n are equal to

   (A) $-1, 5$ (B) $-1, -5$ (C) $1, -9$ (D) $1, 9$

9. If $f(x) = ax - 2$, $g(x) = 2x - 1$ and $f \circ g = g \circ f$, then the value of a is

   (A) -3 (B) 3 (C) $\frac{1}{3}$ (D) 13

10. If f is a identity function, then the value of $f(1) - 2f(2) + f(3)$ is

    (A) 1 (B) 0 (C) -1 (D) -3

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

    (A) $\frac{1}{y^8}$ (B) $\frac{1}{y^6}$ (C) $\frac{1}{y^4}$ (D) $\frac{1}{y^3}$

12. If $f(x) = 2 - 3x$ then $f \circ f(1 - x) =$?

    (A) $9x - 5$ (B) $5x - 9$ (C) $5x + 9$ (D) $5 - 9x$

13. If $f(x) + f(1 - x) = 2$ then $f(\frac{1}{2})$ is

    (A) 1 (B) -1 (C) 5 (D) -9

14. If f is a constant function of value $\frac{1}{10}$. Then the value of $f(1) + f(2) + \cdots + f(100)$ is

    (A) $\frac{1}{10}$ (B) 10 (C) 100 (D) $\frac{1}{100}$

15. If $f(x) = \frac{x+1}{x-2}$ and $g(x) = \frac{1+2x}{x-1}$ then $f \circ g(x)$ is

    (A) Constant function (B) Identity function

    (C) Quadratic function (D) Cubic function

CHAPTER – 2 (NUMBERS AND SEQUENCES)

1. What is the HCF of the least prime number and the least composite number?

   (A) 1 (B) 2 (C) 3 (D) 4

2. If 'a' and 'b' are two positive integers where $a > b$ and 'b' is a factor of 'a' then HCF of (a, b) is

   (A) b (B) a (C) ab (D) $\frac{a}{b}$

3. If m and n are co-prime numbers, then m^2 and n^2 are

   (A) co-prime (B) not co-prime

   (C) even (D) odd

4. If 3 is the least prime factor of number a and 7 is the least prime factor of b then the least prime factor of $a + b$ is

   (A) $a + b$ (B) 2 (C) 5 (D) 10

5. The remainder when the difference between 60002 and 601 is divided $by 6 is$

   (A) 2 (B) 1 (C) 0 (D) 3

6. $44 \equiv 8(mod 12)$, $113 \equiv 5$ (mod 12), thus $44 \times 113 \equiv$_____(mod 12)

   (A) 4 (B) 3 (C) 2 (D) 1

7. Given $a_1 = -1$ and $a_n = \frac{a_{n-1}}{n+2}$ then a_4 is

(A) $\frac{-1}{20}$ (B) $\frac{-1}{4}$ (C) $\frac{-1}{840}$ (D) $\frac{-1}{120}$

8. The first term of an A.P. whose 8^{th} and 12^{th} terms are 39 and 59 respectively

(A) 5 (B) 6 (C) 4 (D) 3

9. In the arithmetic series, $S_n = k + 2k + 3k + \cdots + 100$, k is a positive integer and k is a factor of 100 then S_n is

(A) $5000 + \frac{50}{k}$ (B) $\frac{5000}{k} + 50$

(C) $\frac{1000}{k} + 10$ (D) $1000 + \frac{10}{k}$

10. How many terms are there in the G.P. $5, 20, 80, 320, \ldots\ 20480$?

(A) 5 (B) 6 (C) 7 (D) 9

11. If p^{th}, q^{th} and r^{th} terms of an A.P. are a, b, c respectively then $a(q-r) + b(r-p) + c(p-q)$ is

(A) 0 (B) $a + b + c$

(C) $p + q + r$ (D) pqr

12. Sum of infinite terms of a G. P is 12 and the first terms is 8. What is the fourth term of the G.P?.

(A) $\frac{8}{27}$ (B) $\frac{4}{27}$ (C) $\frac{8}{20}$ (D) $\frac{1}{3}$

13. A boy saves B_1 on the first day B_2 on the second day, B_4 on the third day and so on. How much did the boy will save up to 20 days?

(A) $2^{19} + 1$ (B) $2^{19} - 1$

(C) $2^{20} - 1$ (D) $2^{11} - 1$

14. The sum of first 'n' terms of the series $a, 3a, 5a, \ldots$ is

(A) na (B) $(2n-1)a$ (C) n^2a (D) n^2a^2

15. If p, q, r, x, y, z are in A.P, then $5p + 3{,}5q + 3{,}5r + 3{,}5x + 3{,}5y + 3{,}5z + 3$ form

(A) a G.P (B) an A.P (C) a constant sequence

(D) neither an A.P nor a G.P

16. In an A.P if the p^{Th} term is 'q' and the q^{Th} term is p_J then its n^{Th} term is

(A) $p + q - n$ (B) $p + q + n$

(C) $p - q + n$ (D) $p - q - n$

17. A square is drawn by joining the mid points of the sides of a given square in the same way and this process continues indefinitely. If the side of the first square is 4 cm, then the sum of the areas of all the squares is

(A) 8 cm^2 (B) 16 cm^2 (C) 32 cm^2 (D) 64 cm^2

18. Sum of first 'n' terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + \cdots$. is

(A) $\frac{n(n+1)}{2}$ (B) $\sqrt{n}$ (C) $\frac{n(n+1)}{\sqrt{2}}$ (D) 1

CHAPTER – 3 (ALGEBRA)

1. Which of the following are linear equation in three variables

(i) $2X = z$ (ii) $2\ \sin X + Y \cos Y + Z \tan Z = 2$

(iii) $X + 2Y^2 + Z = 3$ (iv) $X - Y - Z = 7$

(A) (i) and (iii) only (B) (i) and (iv) only

(C) (iv) only (D) All

2. The HCF of two polynomials $p(x)$ and $q(x)$ is $2x(x+2)$ and LCM is $24x(x+2)^2(x-2)$. If $p(x) = 8x^3 + 32x^2 + 32x$ then $q(x)$ is equal to

(A) $4x^3 - 16x$ (B) $6x^3 - 24x$

(C) $12x^3 + 24x$ (D) $12x^3 - 24x$

3. Graphically an infinite number of solutions represents

(A) three planes with no point in common

(B) three planes intersecting at a single point

(C) three planes intersecting in a line or coinciding with one another

(D) None

4. Which of the following is correct

(i) Every polynomial has finite number of multiples

(ii) LCM of two polynomials of degree 2 may be a constant

(iii) HCF of 2 polynomials may be a constant

(iv) Degree of HCF of two polynomials is always less then degree of LCM.

(A) (i) and (ii) (B) (iii) and (iv)

(C) (iii) only (D) (iv) only

5. Consider the following statements:

(i) The HCF $of X+Y$ and X^8-Y^8 is $X+Y$

(ii) The HCF of $X+Y$ and X^8+Y^8 is $X+Y$

(iii) The HCF of $X-Y$ and X^8+Y^8 is $X-Y$

(iv) The HCF of $X-Y$ and X^8-Y^8 is $X-Y$

Which of the statements given above are correct?

(A) (i) and (ii) (B) (ii) and (iii)

(C) (i) and (iv) (D) (ii) and (iv)

6. For what set of values $\frac{x^2+5x+6}{x^2+8x+15}$ is undefined

(A) $-3,-5$ (2) -5 (3) $-2,-3,-5$ (4) $-2,-3$

7. $\frac{x^2+7x+12}{x^2+8x+15}\times\frac{x^2+5x}{x^2+6x+8}$

(A) $x+2$ (B) $\frac{x}{x+2}$ (C) $\frac{35x^2+60x}{48x^2+120}$ (D) $\frac{1}{x+2}$

8. If $\frac{p}{q}=a$ then $\frac{p^2+q^2}{p^2-q^2}$ is

(A) $\frac{a^2+1}{a^2-1}$ (B) $\frac{1+a^2}{1-a^2}$ (C) $\frac{1-a^2}{1+a^2}$ (D) $\frac{a^2-1}{a^2+1}$

9. The square root of $4m^2-24m+36=0$ is

(A) $4(m-3)$ (B) $2\ (m-3)$

(C) $(2m-3)^2$ (D) $(m-3)$

10. The real roots of the quadratic equation $x^2-x-1=0$ are

(A) 1, 1 (B) $-1,1$ (C) $\frac{1+\sqrt{5}}{2},\frac{1-\sqrt{5}}{2}$ (D) No real roots

11. Axis of symmetry in the term of vertical line separates parabola into

(A) 3 equal halves (B) 5 equal halves

(C) 2 equal halves (D) 4 equal halves

12. The parabola $y=-3x^2$ is

(A) Open upward (B) Open downward

(C) Open rightward (D) Open leftward

13. The product of the sum and product of roots of equation $(a^2-b^2)x^2-(a+b)^2x+(a^3-b^3)=0$ is (A) $\frac{a^2+ab+b^2}{a-b}$ (B) $\frac{a+b}{a-b}$

(C) $\frac{a-b}{a+b}$ (D) $\frac{a-b}{a^2+ab+b^2}$

14. A quadratic polynomial whose one zero is 5 and sum of the zeros is 0 is given by

(A) x^2-25 (B) x^2-5

(C) x^2-5x (D) x^2-5x+5

15. Choose the correct answer

(i) Every scalar matrix is an identity matrix

(ii) Every identity matrix is a scalar matrix

(iii) Every diagonal matrix is an identity matrix

(iv) Every null matrix is a scalar matrix

(A) (i) and (iii) only (B) (iii) only

(C) (iv) only (D) (ii) and (iv) only

16. If $2A+3B=\begin{pmatrix}2&-1&4\\3&2&5\end{pmatrix}$ and $A+2B=\begin{pmatrix}5&0&3\\1&6&2\end{pmatrix}$ then $B=$

(A) $\begin{pmatrix}8&-1&-2\\-1&10&-1\end{pmatrix}$ (B) $\begin{pmatrix}8&-1&2\\-1&10&-1\end{pmatrix}$

(C) $\begin{pmatrix}8&1&2\\1&10&1\end{pmatrix}$ (D) $\begin{pmatrix}8&1&2\\-1&10&-1\end{pmatrix}$

17. If $[4\ 3\ 2]\begin{bmatrix}1\\-2\\x\end{bmatrix}=[6]$ then x is

(A) 4 (B) 3 (C) 2 (D) 1

18. $If A=\begin{bmatrix}1&2\\3&4\\5&6\end{bmatrix}, B=\begin{bmatrix}1&2&3\\4&5&6\end{bmatrix}$ then which of the following products can be made from these matrices

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

(A) (i) only (B) (ii) and (iii) only

(C) (iii) and (iv) only (D) All the above

19. $If A=\begin{bmatrix}y&0\\3&4\end{bmatrix}$ and $I=\begin{bmatrix}1&0\\0&1\end{bmatrix}$ then $A^2=16I$ for

(A) $y=4$ (B) $y=5$ (C) $y=-4$ (D) $y=16$

20. If P and Q are $matrices_t$ then which ofthe following is true?

(A) $PQ\neq QP$ (B) $(P^T)^T\neq P$

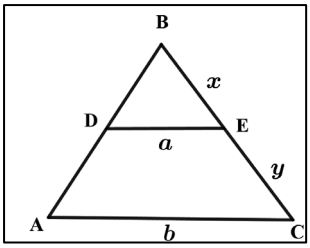
(C) $P+Q\neq Q+P$ (D) All are true

CHAPTER – 4 (GEOMETRY)

1. If triangle PQR is similar to triangle LMN such that $4PQ=LM$ and $QR=6\ cm$ then MN is equal to

(A) 12 cm (B) 24 cm (3) 10 cm (4) 36 cm

2. In the given figure $DE \,||AC$ which of the following is

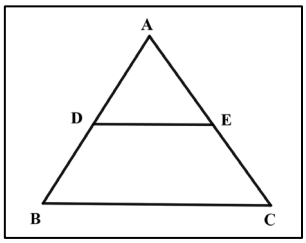


(A) $x = \frac{ay}{b+a}$ (B) $x = \frac{a+b}{ay}$ (C) $x = \frac{ay}{b-a}$ (D) $\frac{x}{y} = \frac{a}{b}$

3. S and T are points on sides PQ and PR respectively of ΔPQR. If $PS = 3\ cm, SQ = 6cm, PT = 5\ cm$ and $TR = 10cm$ then QR

(A) $4ST$ (B) $5ST$ (C) $3ST$ (D) $3OR$

4. In figure $DE \,||BC$, if $BD = x - 3, BA = 2x, CE = x - 2$ and $AC = 2x + 3$. Find the value of x.



(A) 3 (B) 6 (C) 9 (D) 12

5. The ratio of the areas of two similar triangles is equal to

(A) The ratio of their corresponding sides

(B) The cube of the ratio of their corresponding sides

(C) The ratio of their corresponding altitudes

(D) The square of the ratio of their corresponding sides

6. $If ABC$ is a triangle and AD bisects $\angle A, AB = 4cm, BD = 6\ cm, DC = 8cm$ then the value $of\ AC$ is

(A) $\frac{16}{3}\ cm$ (B) $\frac{32}{3}\ cm$ (C) $\frac{3}{16}\ cm$ (D) $\frac{1}{2}\ cm$

7. In a triangle, the internal bisector of an angle bisects the opposite side. Find the nature of the triangle.

(A) right angle (B) equilateral

(C) scalene (D) isosceles

8. The height of an equilateral triangle of side a is

(A) $\frac{a}{2}$ (B) $\sqrt{3}a$ (C) $\frac{\sqrt{3}}{2}a$ (D) $\frac{\sqrt{3}}{4}a$

9. The perimeter of right triangle is 40 cm. Its hypotenuse is 15 cm_J then the area ofthe triangle is

(A) 100 cm^2 (B) 200 cm^2

(C) 160 cm^2 (D) 225 cm^2

10. A line which intersects a circle at two distinct points is called

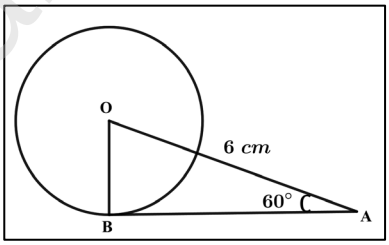
(A) Point of contact (B) secant

(C) diameter (D) tangent

11. If the angle between two radii of a circle is 130^{oJ} the angle between the tangents at the end of the radii is

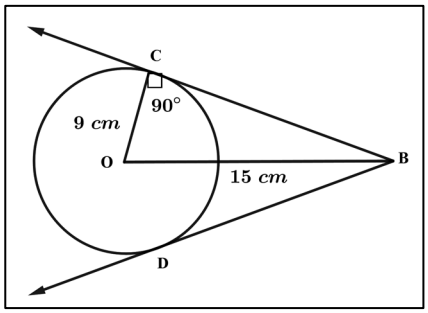
(A) 50° (B) 90° (C) 40° (D) 70°

12. In figure $\angle 0AB = 60^o$ and $OA = 6\ cm$ then radius of the circle is



(A) $\frac{3}{2}\sqrt{3}\ cm$ (B) $2\ cm$ (C) $3\sqrt{3}\ cm$ (D) $2\sqrt{3}\ cm$

13. In the given figure if $OC = 9\ cm$ and $OB = 15\ cm$ then $OB + BD$ is equal to



(A) 23 cm (B) 24 cm (C) 27 cm (D) 30 cm

14. Two concentric circles of radii a and b where $a > b$ are given. The length of the chord of the larger circle which touches the smaller circle is

(A) $\sqrt{a^2 - b^2}$ (B) $2\sqrt{a^2 - b^2}$

(C) $\sqrt{a^2 + b^2}$ (D) $2\sqrt{a^2 + b^2}$

15. Three circles are drawn with the vertices of a triangle as centres such that each circle touches the other two if the sides of the triangle are 3 cm and 4 cm. Find the diameter of the smallest circle.

(A) 1 cm (B) 3 cm (C) 5 cm (D) 4 cm

CHAPTER – 5 (COORDINATE GEOMETRY)

1. Find the ratio in which the line segment joining the points $(-3,10) and (6,-8) is$ internally divided by $(-1,6)$

(A) 7:2 (B) 3:4 (C) 2:7 (D) 5:3

2. If the points $(0,0), (a,0)$ and $(0,b)$ are collinear then

(A) $a=b$ (B) $a+b=0$ (C) $ab=0$ (D) $a\neq b$

3. If the mid-point of the line segment joining $A\left(\frac{x}{2},\frac{y+1}{2}\right)$ and $B(x+1,y-3)$ is $C(5,-2)$ then find the values of x,y

(A) $(6,-1)$ (B) $(-6,1)$ (C) $(-2,1)$ (D) $(3,5)$

4. The area of triangle formed by the points $(a,b+c)$, $(b,c+a)$ and $(c,a+b)$ is

(A) $a+b+c$ (B) abc (C) $(a+b+c)^2$ (D) 0

5. The four vertices of a quadrilateral are $(1,2)$, $(-5,6)$, $(7,-4)$ and $(k,-2)$ taken in order. If the area of quadrilateral is zero then find the value of

(A) -4 (B) -2 (C) 6 (D) 3

6. Find the equation of the line passing through the point $(5,3)$ which is parallel to the y axis is

(A) $y=5$ (B) $y=3$ (C) $x=5$ (D) $x=3$

7. Find the slope of the line $2y=x+8$

(A) $\frac{1}{2}$ (B) 1 (C) 8 (D) 2

8. Find the value of , given that the line $\frac{y}{2}=x-p$ passes through the point $(-4,4)$ is

(A) -4 (B) -6 (C) 0 (D) 8

9. Find the slope and the y -intercept of the line $3y-\sqrt{3}x+1=0$ is

(A) $\frac{1}{\sqrt{3}},-\frac{1}{3}$ (B) $-\frac{1}{\sqrt{3}},-\frac{1}{3}$ (C) $\sqrt{3},1$ (D) $-\sqrt{3},3$

10. The lines $y=5x-3, y=2x+9$ intersect at A. The coordinates of A are

(A) $(2,7)$ (B) $(2,3)$ (C) $(4,17)$ (D) $(-4,23)$

11. Find the value of a' if the lines $7y=ax+4$ and $2y=3-x$ are parallel.

(A) $a=\frac{7}{2}$ (B) $a=-\frac{2}{7}$ (C) $a=\frac{2}{7}$ (D) $a=-\frac{7}{2}$

12. Aline passing through the point $(2_t 2)$ and the axes enclose an area α. The intercepts on the axes made by the line are given by the roots of

(A) $x^2-2\alpha x+\alpha=0$ (B) $x^2+2\alpha x+2\alpha=0$

(C) $x^2-\alpha x+2\alpha=0$ (D) none of these

13. Find the equation of the line passing through the point $(0,4)$ and is parallel to the line $3x+5y+15=0$ is

(A) $3x+5y+15=0$ (B) $3x+5y-20=0$

(C) $2x+7y-20=0$ (D) $4x+3y-15=0$

14. In a right angled triangle , right angled at B, if the side BC is parallel to x axis, then the slope of AB is

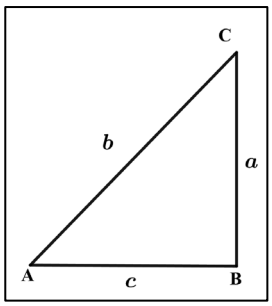
(A) $\sqrt{3}$ (B) $\frac{1}{\sqrt{3}}$ (C) 1 (D) not defined

15. The Y-intercept of the line $3x-4y+8=0$ is

(A) $-\frac{8}{3}$ (B) $\frac{3}{8}$ (C) 2 (D) $\frac{1}{2}$

CHAPTER – 6 (TRIGONOMETRY)

1. From the figure, the value of $cosec\ \theta+\cot\theta$ is



(A) $\frac{a+b}{c}$ (B) $\frac{c}{a+b}$ (C) $\frac{b+c}{a}$ (D) $\frac{b}{a+c}$

2. $(\sec A+\tan A)(1-\sin A)$ is equal to

(A) $\sec A$ (B) $\sin A$ (C) $cosec\ A$ (D) $\cos A$

3. $If X = r \sin\theta \cos\varphi, y = r \sin\theta \sin\varphi$ and $z = r \cos\theta$,Then,$X^2 + Y^2 + Z^2$ is equal to

(A) r (B) r^2 (C) $\frac{r^2}{2}$ (D) $2r^2$

4. If $\cos\theta + \cos^2\theta = 1$ then $\sin^2\theta + \sin^4\theta$ is equal to

(A) 1 (B) 0 (C) -1 (D) none of these

5. If $\tan\theta + \cot\theta = 3$ then $\tan^2\theta + \cot^2\theta$ is equal to

(A) 4 (B) 7 (C) 6 (D) 9

6. If $m\cos\theta + n\sin\theta = a$ and $m\sin\theta - n\cos\theta = b$ then $a^2 + b^2$ is equal to

(A) $m^2 - n^2$ (B) $m^2 + n^2$

(C) m^2n^2 (D) $n^2 - m^2$

7. $\frac{\tan\theta}{\sec\theta - 1} + \frac{\tan\theta}{\sec\theta + 1}$ is equal to

(A) $2\tan\theta$ (B) $2\sec\theta$

(C) $2\,cosec\,\theta$ (D) $2\tan\theta\sec\theta$

8. The value of $\left(\frac{3}{\cot^2\theta} - \frac{3}{\cos^2\theta}\right)$ is equal to

(A) $\frac{1}{3}$ (B) 3 (C) 0 (D) -3

9. If $\sin(\alpha + \beta) = 1_J$ then $\cos(\alpha - \beta)$ can be reduced to

(A) $\sin\alpha$ (B) $\cos\beta$ (C) $\sin 2\beta$ (D) $\cos 2\beta$

10. $If X = a\sec\theta$ and $Y = b\tan\theta_t$ then $b^2X^2 - a^2Y^2$ is equal to

(A) ab (B) $a^2 - b^2$ (C) $a^2 + b^2$ (D) a^2b^2

11. The angle of elevation of the top of tree from a point at a distance of 250 m from its base is 60°. The heights of the tree is

(A) 250 m (B) 250 $\sqrt{3}m$ (C) $\frac{250}{\sqrt{3}}m$ (D) 200 $\sqrt{3}m$

12. The angle of depression of a boat from a 50 $\sqrt{3}m$ high bridge is 30°. The horizontal distance of the boat from the bridge is

(A) 150 m (B) 150 $\sqrt{3}m$ (C) 60 m (D) 60 $\sqrt{3}m$

13. A Ladder of length 14 m just reaches the top of a wall. If the ladder makes an angle of 60^o with the horizontal then the height of the wall is

(A) 14 $\sqrt{3}$ m (B) 28 $\sqrt{3}$ m

(C) 7 $\sqrt{3}$ m (D) 35 $\sqrt{3}$ m

14. The top of two poles of height 18.5 m and 7 m are connected by a wire. If the wire makes an angle of measure 30^o with horizontal then the length of the wire is

(A) 23 m (B) 18 m (C) 28 m (D) 25.5 m

15. The banks of a river are parallel. A swimmer starts from a point on one of the banks and swims in a straight line inclined to the bank at 45° and reaches the opposite bank at a point 20 m, from the point opposite to the starting point. The breadth of the river is equal to $(\sqrt{2} = 1.414)$.

(A) 12.12 m (B) 14. 14 m

(C) 16.16 m (D) 18.18 m

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 πcm^2 (B) 66πcm^2

(C) 120πcm^2 (D) 136πcm^2

2. If S_1 denotes the total surface area of a sphere of radius r and S_2 denotes the total surface area of a cylinder of base radius r and height $2r$, then

(A) $S_1 = S_2$ (B) $S_1 > S_2$ (C) $S_1 < S_2$ (D) $S_1 = 2S_2$

3. The ratio of the volumes of two spheres is 8: 27. If r and R are the radii of spheres Respectively, then $(R - r) : r$ is

(A) 1: 2 (B) 1: 3 (C) 2: 3 (D) 4: 9

4. The radius of a wire is decreased to one-third of the original. If volume remains the same, then the length will be increased — of the original.

(A) 3 times (B) 6 times (C) 9 times (D) 27 times

5. The height of a cone is 60 cm. A small cone is cut off at the top by a plane parallel to the base and its volume is $\left(\frac{1}{64}\right)^{\text{th}}$ the volume the original cone. The height of the smaller cone is

(A) 45 cm (B) 30 cm (C) 15 cm (D) 20 cm

6. A solid frustum is of height 8 cm. If the radii of its lower and upper ends are 3 cm and 9 cm respectively, then its slant height is
(A) 15 cm (B) 12 cm (C) 10 cm (D) 17 cm

7. A solid is hemispherical at the bottom and conical above. If the curved surface areas of the two parts are equal, then the ratio of its radius and the height of its conical part is
(A) 1: 3 (B) $1:\sqrt{3}$ (C) 1: 1 (D) $\sqrt{3}:1$

8. The material of a cone is converted into the shape of a cylinder of equal radius. If the height of the cylinder is 5 cm, then height of the cone is
(A) 10 cm (B) 15 cm (C) 18 cm (D) 24 cm

9. The curved surface area of a cylinder is 264 $m^{\angle}$ and its volume is 924 m^3. The ratio of diameter to its height is
(A) 3: 7 (B) 7: 3 (C) 6: 7 (D) 7:6

10. When Karuna divided surface area of a sphere by the sphere's volume, he got the answer as $\frac{1}{3}$. What is the radius of the sphere?
(A) 24 cm (B) 9 cm (C) 54 cm (D) 4.5 cm

11. A spherical steel ball is melted to make 8 new identical balls. Then the radius each new ball is how much times the radius of the original ball?
(A) $\frac{1}{3}$ (B) $\frac{1}{4}$ (C) $\frac{1}{2}$ (D) $\frac{1}{8}$

12. A semicircular thin sheet of a metal diameter 28 cm is bent and an open conical cup is made. What is the capacity of the cup?
(A) $\left(\frac{1000}{3}\right)\sqrt{3}cm^3$ (B) $300\sqrt{3}cm^3$
(C) $\left(\frac{700}{3}\right)\sqrt{3}cm^3$ (D) $\left(\frac{1078}{3}\right)\sqrt{3}\ cm^3$

13. A cone of height 9 cm with diameter of its base 18 cm is carved out from a wooden solid sphere of radius 9 cm. The percentage of wood wasted is
(A) 45% (B) 56 % (C) 67% (D) 75%

14. A cylinder having radius 1 m and height 5 m is completely filled with milk. In how many conical flasks can this milk be filled if the flask radius and height is 50 cm each?
(A)50 (B)500 (C) 120 (D)160

15. A floating boat having a length 3 m and breadth 2 m is floating on alake. The boat sinks by 1 cm when a man gets into it. The mass of the man is (density of water is 1000 kg/m^3)
(A) 50 kg (B) 60 kg (C) 70 kg (D) 80 kg

CHAPTER – 8 (STATISTICS AND PROBABILITY)

1. The range of first 10 prime numbers is
(A) 9 (B) 20 (C) 27 (D) 5

2. If the smallest value and co-efficient of range of a data are 25 and 0.5 respectively. Then the largest value is
(A) 25 (B) 75 (C) 100 (D) 12.5

3. If the standard deviation of a variable x is 4 and if $y = \frac{3x+5}{4}t$ then the standard deviation of y is
(A) 4 (B) 3.5 (C) 3 (D) 2.5

4. If the observations 1, 2, 3, 50 have the variance V_1 and the observations 51, 52, 53, 100 have the variance V_2 then $\frac{y_1}{y_2}$ is
(A) 2 (B) 1 (C) $\frac{1}{2}$ (D) 0

5. If the data is multiplied by 4, then the corresponding variance is get multiplied by
(A) 4 (B) 16 (C) 2 (D) None

6. If the co-efficient of variation and standard deviation of a data are 35% and 7.7 respectively then the mean is
(A) 20 (B) 30 (C) 25 (D) 22

7. The batsman A is more consistent than batsman B if
(A) C.V of $A > C.V$ of B (B) C.V of $A < C.V$ of B
(C) C.V of $A = C.V$ of B (D) C.V of $A \geq C.V$ of B

8. If an event occurs surely, then its probability is
(A) 1 (B) 0 (C) $\frac{1}{2}$ (D) $\frac{3}{4}$

9. A number x is chosen at random from $-4, -3, -2, -1, 0, 1, 2, 3, 4$. The probability that $|x| \leq 3$ is

(A) $\frac{3}{9}$ (B) $\frac{4}{9}$ (C) $\frac{2}{9}$ (D) $\frac{7}{9}$

10. A letter is selected at random from the word 'PROBABILITY'. The Probability that it is not a vowel is

(A) $\frac{4}{11}$ (B) $\frac{7}{11}$ (C) $\frac{3}{11}$ (D) $\frac{6}{11}$

11. In a competition containing two events A and B_J the probability of winning the events A and B are $\frac{1}{3}$ and $\frac{1}{4}$ respectively and the probability of winning both the events is $\frac{1}{12}$. The probability of winning only one event is

(A) $\frac{1}{12}$ (B) $\frac{5}{12}$ (C) $\frac{1}{12}$ (D) $\frac{7}{12}$

12. If the probability of non-happening of an events is q_J then the probability of happening of the event is

(A) $1-q$ (B) q (C) $\frac{q}{7}$ (D) $2q$

13. When three coins are $tossed_t$ the probability of getting the same face on all the three coins is

(A) $\frac{1}{8}$ (B) $\frac{1}{4}$ (C) $\frac{3}{8}$ (D) $\frac{1}{3}$

14. In one thousand lottery tickets, there are 50 prizes to be given. The probability of Mani winning a prize who bought one ticket is

(A) $\frac{1}{50}$ (B) $\frac{1}{100}$ (C) $\frac{1}{1000}$ (D) $\frac{1}{20}$

15. A box contains some milk chocolates and some coco chocolates and there are 60 chocolates in the box. If the probability of taking a milk chocolate is $\frac{2}{3}$ then the number of coco chocolates is

(A) 40 (B) 50 (C) 20 (D) 30

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All the best Students

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ROUGH WORK

10th MATHS QR CODE QUESTIONS ANSWER - BOOK NEW SYLLABUS EM (2024-2025)

CHAPTER – 1 (RELATIONS AND FUNCTIONS)

1. If $f : R \to R$ defined by $f(x) = x^2 + 2$, then the pre-images of 27 are

(A) $5, -5$ (B) $\sqrt{5}, -\sqrt{5}$ (C) 5, 0 (D) 0,5

2. If $f(x - \frac{1}{x}) = x^2 + \frac{1}{x^2}$, then $f(x) =$_____.

(A) $x^2 + 2$ (B) $x^2 - 2$ (C) $x^2 + \frac{1}{x^2}$ (D) $x^2 - \frac{1}{x^2}$

3. $If A = \{a, b, c\}, B = \{2,3\}$ and $C = \{a, b, c, d\}$ then $n[(A \cap C) \times B]$ is

(A) 4 (B) 8 (C) 6 (D) 12

4. If the ordered pairs $(a, 1)$ and $(5, b)$ belong to $\{(x, y)/y = 2x + 3\}$, then the values of a and b are

(A) $-13,2$ (B) 2, 13 (C) 2, -13 (D) $-2,13$

5. The function $f : M \to M$ is defined by $f(x) = 2x$. Then the function f is

(A) Not one-one but onto (B) one-one but not onto

(C) one-one and onto (D) not one-one and not onto

6. If $f(x) = \chi + 1_J$ then $f(f(f(y + 2)))$ is

(A) $y + 3$ (B) $y + 5$ (C) $y + 7$ (D) $y + 9$

7. The function r which maps temperature in degree Celsius into temperature in degree Fahrenheit is defined by $t(c) = \frac{9c}{5} + 32$. The Fahrenheit degree is 95 then the value of c will be

(A) 37 (B) 36 (C) 35 (D) 29

8. If $f(x) = mx + n_J$ where m and n are integers, $f(-2) = 7$ and $f(3) = 2$ then m and n are equal to

(A) $-1, 5$ (B) $-1, -5$ (C) $1, -9$ (D) $1, 9$

9. If $f(x) = ax - 2, g(x) = 2x - 1$ and $f \circ g = g \circ f$, then the value of a is

(A) -3 (B) 3 (C) $\frac{1}{3}$ (D) 13

10. If f is a identity function, then the value of $f(1) - 2f(2) + f(3)$ is

(A) 1 (B) 0 (C) -1 (D) -3

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

(A) $\frac{1}{y^8}$ (B) $\frac{1}{y^6}$ (C) $\frac{1}{y^4}$ (D) $\frac{1}{y^3}$

12. If $f(x) = 2 - 3x$ then $f \circ f(1 - x) =$?

(A) $9x - 5$ (B) $5x - 9$ (C) $5x + 9$ (D) $5 - 9x$

13. If $f(x) + f(1 - x) = 2$ then $f(\frac{1}{2})$ is

(A) 1 (B) -1 (C) 5 (D) -9

14. If f is a constant function of value $\frac{1}{10}$. Then the value of $f(1) + f(2) + \cdots + f(100)$ is

(A) $\frac{1}{10}$ (B) 10 (C) 100 (D) $\frac{1}{100}$

15. If $f(x) = \frac{x+1}{x-2}$ and $g(x) = \frac{1+2x}{x-1}$ then $f \circ g(x)$ is

(A) Constant function (B) Identity function

(C) Quadratic function (D) Cubic function

CHAPTER – 2 (NUMBERS AND SEQUENCES)

1. What is the HCF of the least prime number and the least composite number?

(A) 1 (B) 2 (C) 3 (D) 4

2. If 'a' and 'b' are two positive integers where $a > b$ and 'b' is a factor of 'a' then HCF of (a, b) is

(A) b (B) a (C) ab (D) $\frac{a}{b}$

3. If m and n are co-prime numbers, then m^2 and n^2 are

(A) co-prime (B) not co-prime

(C) even (D) odd

4. If 3 is the least prime factor of number a and 7 is the least prime factor of b then the least prime factor of $a + b$ is

(A) $a + b$ (B) 2 (C) 5 (D) 10

5. The remainder when the difference between 60002 and 601 is divided $by 6 is$

(A) 2 (B) 1 (C) 0 (D) 3

6. $44 \equiv 8(mod 12)$, $113 \equiv 5$ (mod 12), thus $44 \times 113 \equiv$_____(mod 12)

(A) 4 (B) 3 (C) 2 (D) 1

7. Given $a_1 = -1$ and $a_n = \frac{a_{n-1}}{n+2}$ then a_4 is

(A) $\frac{-1}{20}$ (B) $\frac{-1}{4}$ (C) $\frac{-1}{840}$ (D) $\frac{-1}{120}$

8. The first term of an A.P. whose 8^{th} and 12^{th} terms are 39 and 59 respectively

(A) 5 (B) 6 (C) 4 (D) 3

9. In the arithmetic series, $S_n = k + 2k + 3k + \cdots + 100$, k is a positive integer and k is a factor of 100 then S_n is

(A) $5000 + \frac{50}{k}$ (B) $\frac{5000}{k} + 50$

(C) $\frac{1000}{k} + 10$ (D) $1000 + \frac{10}{k}$

10. How many terms are there in the G.P. $5, 20, 80, 320, \ldots\ 20480$?

(A) 5 (B) 6 (C) 7 (D) 9

11. If p^{th}, q^{th} and r^{th} terms of an A.P. are a, b, c respectively then $a(q-r) + b(r-p) + c(p-q)$ is

(A) 0 (B) $a + b + c$

(C) $p + q + r$ (D) pqr

12. Sum of infinite terms of a G. P is 12 and the first terms is 8. What is the fourth term of the G.P?.

(A) $\frac{8}{27}$ (B) $\frac{4}{27}$ (C) $\frac{8}{20}$ (D) $\frac{1}{3}$

13. A boy saves B_1 on the first day B_2 on the second day, B_4 on the third day and so on. How much did the boy will save up to 20 days?

(A) $2^{19} + 1$ (B) $2^{19} - 1$

(C) $2^{20} - 1$ (D) $2^{11} - 1$

14. The sum of first 'n' terms of the series $a, 3a, 5a, \ldots$. is

(A) na (B) $(2n-1)a$ (C) n^2a (D) n^2a^2

15. If p, q, r, x, y, z are in A.P, then $5p + 3{,}5q + 3{,}5r + 3{,}5x + 3{,}5y + 3{,}5z + 3$ form

(A) a G.P (B) an A.P (C) a constant sequence

(D) neither an A.P nor a G.P

16. In an A.P if the p^{Th} term is 'q' and the q^{Th} term is p_J then its n^{Th} term is

(A) $p + q - n$ (B) $p + q + n$

(C) $p - q + n$ (D) $p - q - n$

17. A square is drawn by joining the mid points of the sides of a given square in the same way and this process continues indefinitely. If the side of the first square is 4 cm, then the sum of the areas of all the squares is

(A) 8 cm^2 (B) 16 cm^2 (C) 32 cm^2 (D) 64 cm^2

18. Sum of first 'n' terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + \cdots$. is

(A) $\frac{n(n+1)}{2}$ (B) $\sqrt{n}$ (C) $\frac{n(n+1)}{\sqrt{2}}$ (D) 1

CHAPTER – 3 (ALGEBRA)

1. Which of the following are linear equation in three variables

(i) $2X = z$ (ii) $2\ \sin X + Y \cos Y + Z \tan Z = 2$

(iii) $X + 2Y^2 + Z = 3$ (iv) $X - Y - Z = 7$

(A) (i) and (iii) only (B) (i) and (iv) only

(C) (iv) only (D) All

2. The HCF of two polynomials $p(x)$ and $q(x)$ is $2x(x+2)$ and LCM is $24x(x+2)^2(x-2)$. If $p(x) = 8x^3 + 32x^2 + 32x$ then $q(x)$ is equal to

(A) $4x^3 - 16x$ (B) $6x^3 - 24x$

(C) $12x^3 + 24x$ (D) $12x^3 - 24x$

3. Graphically an infinite number of solutions represents

(A) three planes with no point in common

(B) three planes intersecting at a single point

(C) three planes intersecting in a line or coinciding with one another

(D) None

4. Which of the following is correct

(i) Every polynomial has finite number of multiples

(ii) LCM of two polynomials of degree 2 may be a constant

(iii) HCF of 2 polynomials may be a constant

(iv) Degree of HCF of two polynomials is always less then degree of LCM.

(A) (i) and (ii) (B) (iii) and (iv)

(C) (iii) only (D) (iv) only

5. Consider the following statements:

(i) The HCF $of X+Y$ and X^8-Y^8 is $X+Y$

(ii) The HCF of $X+Y$ and X^8+Y^8 is $X+Y$

(iii) The HCF of $X-Y$ and X^8+Y^8 is $X-Y$

(iv) The HCF of $X-Y$ and X^8-Y^8 is $X-Y$

Which of the statements given above are correct?

(A) (i) and (ii) (B) (ii) and (iii)

(C) (i) and (iv) (D) (ii) and (iv)

6. For what set of values $\frac{x^2+5x+6}{x^2+8x+15}$ is undefined

(A) $-3,-5$ (2) -5 (3) $-2,-3,-5$ (4) $-2,-3$

7. $\frac{x^2+7x+12}{x^2+8x+15}\times\frac{x^2+5x}{x^2+6x+8}$

(A) $x+2$ (B) $\frac{x}{x+2}$ (C) $\frac{35x^2+60x}{48x^2+120}$ (D) $\frac{1}{x+2}$

8. If $\frac{p}{q}=a$ then $\frac{p^2+q^2}{p^2-q^2}$ is

(A) $\frac{a^2+1}{a^2-1}$ (B) $\frac{1+a^2}{1-a^2}$ (C) $\frac{1-a^2}{1+a^2}$ (D) $\frac{a^2-1}{a^2+1}$

9. The square root of $4m^2-24m+36=0$ is

(A) $4(m-3)$ (B) $2\ (m-3)$

(C) $(2m-3)^2$ (D) $(m-3)$

10. The real roots of the quadratic equation $x^2-x-1=0$ are

(A) 1, 1 (B) $-1,1$ (C) $\frac{1+\sqrt{5}}{2},\frac{1-\sqrt{5}}{2}$ (D) No real roots

11. Axis of symmetry in the term of vertical line separates parabola into

(A) 3 equal halves (B) 5 equal halves

(C) 2 equal halves (D) 4 equal halves

12. The parabola $y=-3x^2$ is

(A) Open upward (B) Open downward

(C) Open rightward (D) Open leftward

13. The product of the sum and product of roots of equation $(a^2-b^2)x^2-(a+b)^2x+(a^3-b^3)=0$ is

(A) $\frac{a^2+ab+b^2}{a-b}$ (B) $\frac{a+b}{a-b}$

(C) $\frac{a-b}{a+b}$ (D) $\frac{a-b}{a^2+ab+b^2}$

14. A quadratic polynomial whose one zero is 5 and sum of the zeros is 0 is given by

(A) x^2-25 (B) x^2-5

(C) x^2-5x (D) x^2-5x+5

15. Choose the correct answer

(i) Every scalar matrix is an identity matrix

(ii) Every identity matrix is a scalar matrix

(iii) Every diagonal matrix is an identity matrix

(iv) Every null matrix is a scalar matrix

(A) (i) and (iii) only (B) (iii) only

(C) (iv) only (D) (ii) and (iv) only

16. If $2A+3B=\begin{pmatrix}2&-1&4\\3&2&5\end{pmatrix}$ and $A+2B=\begin{pmatrix}5&0&3\\1&6&2\end{pmatrix}$ then $B=$

(A) $\begin{pmatrix}8&-1&-2\\-1&10&-1\end{pmatrix}$ (B) $\begin{pmatrix}8&-1&2\\-1&10&-1\end{pmatrix}$

(C) $\begin{pmatrix}8&1&2\\1&10&1\end{pmatrix}$ (D) $\begin{pmatrix}8&1&2\\-1&10&-1\end{pmatrix}$

17. If $[4\ 3\ 2]\begin{bmatrix}1\\-2\\x\end{bmatrix}=[6]$ then x is

(A) 4 (B) 3 (C) 2 (D) 1

18. $If A=\begin{bmatrix}1&2\\3&4\\5&6\end{bmatrix}, B=\begin{bmatrix}1&2&3\\4&5&6\end{bmatrix}$ then which of the following products can be made from these matrices

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

(A) (i) only (B) (ii) and (iii) only

(C) (iii) and (iv) only (D) All the above

19. $If A=\begin{bmatrix}y&0\\3&4\end{bmatrix}$ and $I=\begin{bmatrix}1&0\\0&1\end{bmatrix}$ then $A^2=16I$ for

(A) $y=4$ (B) $y=5$ (C) $y=-4$ (D) $y=16$

20. If P and Q are $matrices_t$ then which ofthe following is true?

(A) $PQ\neq QP$ (B) $(P^T)^T\neq P$

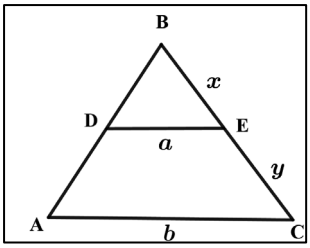
(C) $P+Q\neq Q+P$ (D) All are true

CHAPTER – 4 (GEOMETRY)

1. If triangle PQR is similar to triangle LMN such that $4PQ=LM$ and $QR=6\ cm$ then MN is equal to

(A) 12 cm (B) 24 cm (3) 10 cm (4) 36 cm

2. In the given figure $DE \,||AC$ which of the following is

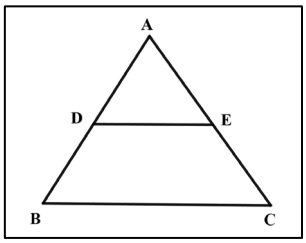


(A) $x = \frac{ay}{b+a}$ (B) $x = \frac{a+b}{ay}$ (C) $x = \frac{ay}{b-a}$ (D) $\frac{x}{y} = \frac{a}{b}$

3. S and T are points on sides PQ and PR respectively of ΔPQR. If $PS = 3\ cm, SQ = 6cm, PT = 5\ cm$ and $TR = 10cm$ then QR

(A) $4ST$ (B) $5ST$ (C) $3ST$ (D) $3OR$

4. In figure $DE \,||BC$, if $BD = x - 3, BA = 2x, CE = x - 2$ and $AC = 2x + 3$. Find the value of x.



(A) 3 (B) 6 (C) 9 (D) 12

5. The ratio of the areas of two similar triangles is equal to

(A) The ratio of their corresponding sides

(B) The cube of the ratio of their corresponding sides

(C) The ratio of their corresponding altitudes

(D) The square of the ratio of their corresponding sides

6. $If ABC$ is a triangle and AD bisects $\angle A, AB = 4cm, BD = 6\ cm, DC = 8cm$ then the value $of\ AC$ is

(A) $\frac{16}{3}\ cm$ (B) $\frac{32}{3}\ cm$ (C) $\frac{3}{16}\ cm$ (D) $\frac{1}{2}\ cm$

7. In a triangle, the internal bisector of an angle bisects the opposite side. Find the nature of the triangle.

(A) right angle (B) equilateral

(C) scalene (D) isosceles

8. The height of an equilateral triangle of side a is

(A) $\frac{a}{2}$ (B) $\sqrt{3}a$ (C) $\frac{\sqrt{3}}{2}a$ (D) $\frac{\sqrt{3}}{4}a$

9. The perimeter of right triangle is 40 cm. Its hypotenuse is 15 cm, then the area ofthe triangle is

(A) 100 cm^2 (B) 200 cm^2

(C) 160 cm^2 (D) 225 cm^2

10. A line which intersects a circle at two distinct points is called

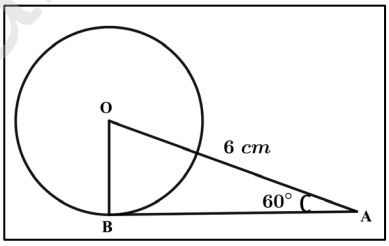
(A) Point of contact (B) secant

(C) diameter (D) tangent

11. If the angle between two radii of a circle is 130^o, the angle between the tangents at the end of the radii is

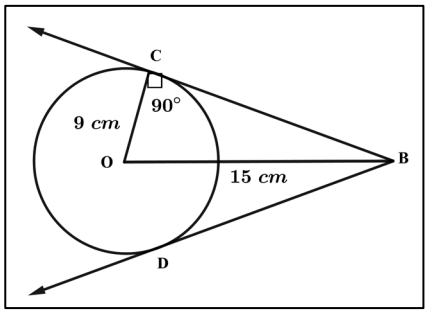
(A) 50° (B) 90° (C) 40° (D) 70°

12. In figure $\angle 0AB = 60^o$ and $OA = 6\ cm$ then radius of the circle is



(A) $\frac{3}{2}\sqrt{3}\ cm$ (B) 2 cm (C) $3\sqrt{3}\ cm$ (D) $2\sqrt{3}\ cm$

13. In the given figure if $OC = 9\ cm$ and $OB = 15\ cm$ then $OB + BD$ is equal to



(A) 23 cm (B) 24 cm (C) 27 cm (D) 30 cm

14. Two concentric circles of radii a and b where $a > b$ are given. The length of the chord of the larger circle which touches the smaller circle is

(A) $\sqrt{a^2 - b^2}$ (B) $2\sqrt{a^2 - b^2}$

(C) $\sqrt{a^2 + b^2}$ (D) $2\sqrt{a^2 + b^2}$

15. Three circles are drawn with the vertices of a triangle as centres such that each circle touches the other two if the sides of the triangle are 3 cm and 4 cm. Find the diameter of the smallest circle.

(A) 1 cm (B) 3 cm (C) 5 cm (D) 4 cm

CHAPTER – 5 (COORDINATE GEOMETRY)

1. Find the ratio in which the line segment joining the points $(-3,10) and (6,-8) is$ internally divided by $(-1,6)$

(A) 7:2 (B) 3:4 (C) 2:7 (D) 5:3

2. If the points $(0,0), (a,0)$ and $(0,b)$ are collinear then

(A) $a=b$ (B) $a+b=0$ (C) $ab=0$ (D) $a\neq b$

3. If the mid-point of the line segment joining $A\left(\frac{x}{2},\frac{y+1}{2}\right)$ and $B(x+1,y-3)$ is $C(5,-2)$ then find the values of x,y

(A) $(6,-1)$ (B) $(-6,1)$ (C) $(-2,1)$ (D) $(3,5)$

4. The area of triangle formed by the points $(a,b+c)$, $(b,c+a)$ and $(c,a+b)$ is

(A) $a+b+c$ (B) abc (C) $(a+b+c)^2$ (D) 0

5. The four vertices of a quadrilateral are $(1,2)$, $(-5,6)$, $(7,-4)$ and $(k,-2)$ taken in order. If the area of quadrilateral is zero then find the value of

(A) -4 (B) -2 (C) 6 (D) 3

6. Find the equation of the line passing through the point $(5,3)$ which is parallel to the y axis is

(A) $y=5$ (B) $y=3$ (C) $x=5$ (D) $x=3$

7. Find the slope of the line $2y=x+8$

(A) $\frac{1}{2}$ (B) 1 (C) 8 (D) 2

8. Find the value of , given that the line $\frac{y}{2}=x-p$ passes through the point $(-4,4)$ is

(A) -4 (B) -6 (C) 0 (D) 8

9. Find the slope and the y -intercept of the line $3y-\sqrt{3}x+1=0$ is

(A) $\frac{1}{\sqrt{3}},-\frac{1}{3}$ (B) $-\frac{1}{\sqrt{3}},-\frac{1}{3}$ (C) $\sqrt{3},1$ (D) $-\sqrt{3},3$

10. The lines $y=5x-3, y=2x+9$ intersect at A. The coordinates of A are

(A) $(2,7)$ (B) $(2,3)$ (C) $(4,17)$ (D) $(-4,23)$

11. Find the value of a' if the lines $7y=ax+4$ and $2y=3-x$ are parallel.

(A) $a=\frac{7}{2}$ (B) $a=-\frac{2}{7}$ (C) $a=\frac{2}{7}$ (D) $a=-\frac{7}{2}$

12. Aline passing through the point $(2_t 2)$ and the axes enclose an area α. The intercepts on the axes made by the line are given by the roots of

(A) $x^2-2\alpha x+\alpha=0$ (B) $x^2+2\alpha x+2\alpha=0$

(C) $x^2-\alpha x+2\alpha=0$ (D) none of these

13. Find the equation of the line passing through the point $(0,4)$ and is parallel to the line $3x+5y+15=0$ is

(A) $3x+5y+15=0$ (B) $3x+5y-20=0$

(C) $2x+7y-20=0$ (D) $4x+3y-15=0$

14. In a right angled triangle , right angled at B, if the side BC is parallel to x axis, then the slope of AB is

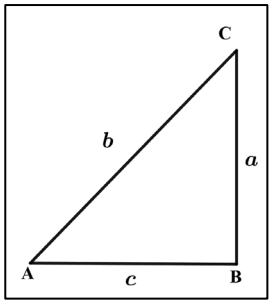
(A) $\sqrt{3}$ (B) $\frac{1}{\sqrt{3}}$ (C) 1 (D) not defined

15. The Y-intercept of the line $3x-4y+8=0$ is

(A) $-\frac{8}{3}$ (B) $\frac{3}{8}$ (C) 2 (D) $\frac{1}{2}$

CHAPTER – 6 (TRIGONOMETRY)

1. From the figure, the value of $cosec\,\theta+\cot\theta$ is



(A) $\frac{a+b}{c}$ (B) $\frac{c}{a+b}$ (C) $\frac{b+c}{a}$ (D) $\frac{b}{a+c}$

2. $(\sec A+\tan A)(1-\sin A)$ is equal to

(A) $\sec A$ (B) $\sin A$ (C) $cosec\,A$ (D) $\cos A$

3. $If X = r \sin\theta \cos\varphi, y = r \sin\theta \sin\varphi$ and $z = r \cos\theta$,Then,$X^2 + Y^2 + Z^2$ is equal to

(A) r (B) r^2 (C) $\frac{r^2}{2}$ (D) $2r^2$

4. If $\cos\theta + \cos^2\theta = 1$ then $\sin^2\theta + \sin^4\theta$ is equal to

(A) 1 (B) 0 (C) -1 (D) none of these

5. If $\tan\theta + \cot\theta = 3$ then $\tan^2\theta + \cot^2\theta$ is equal to

(A) 4 (B) 7 (C) 6 (D) 9

6. If $m\cos\theta + n\sin\theta = a$ and $m\sin\theta - n\cos\theta = b$ then $a^2 + b^2$ is equal to

(A) $m^2 - n^2$ (B) $m^2 + n^2$

(C) m^2n^2 (D) $n^2 - m^2$

7. $\frac{\tan\theta}{\sec\theta - 1} + \frac{\tan\theta}{\sec\theta + 1}$ is equal to

(A) 2 $\tan\theta$ (B) 2 $\sec\theta$

(C) 2 $cosec\,\theta$ (D) 2 $\tan\theta \sec\theta$

8. The value of $\left(\frac{3}{\cot^2\theta} - \frac{3}{\cos^2\theta}\right)$ is equal to

(A) $\frac{1}{3}$ (B) 3 (C) 0 (D) -3

9. If $\sin(\alpha + \beta) = 1_J$ then $\cos(\alpha - \beta)$ can be reduced to

(A) $\sin\alpha$ (B) $\cos\beta$ (C) $\sin 2\beta$ (D) $\cos 2\beta$

10. $If X = a \sec\theta$ and $Y = b \tan\theta_t$ then $b^2X^2 - a^2Y^2$ is equal to

(A) ab (B) $a^2 - b^2$ (C) $a^2 + b^2$ (D) a^2b^2

11. The angle of elevation of the top of tree from a point at a distance of 250 m from its base is 60°. The heights of the tree is

(A) 250 m (B) $250\sqrt{3}m$ (C) $\frac{250}{\sqrt{3}}m$ (D) $200\sqrt{3}m$

12. The angle of depression of a boat from a $50\sqrt{3}m$ high bridge is 30°. The horizontal distance of the boat from the bridge is

(A) 150 m (B) $150\sqrt{3}m$ (C) 60 m (D) $60\sqrt{3}m$

13. A Ladder of length 14 m just reaches the top of a wall. If the ladder makes an angle of 60^o with the horizontal then the height of the wall is

(A) $14\sqrt{3}\,m$ (B) $28\sqrt{3}\,m$

(C) $7\sqrt{3}\,m$ (D) $35\sqrt{3}\,m$

14. The top of two poles of height 18.5 m and 7 m are connected by a wire. If the wire makes an angle of measure 30^o with horizontal then the length of the wire is

(A) 23 m (B) 18 m (C) 28 m (D) 25.5 m

15. The banks of a river are parallel. A swimmer starts from a point on one of the banks and swims in a straight line inclined to the bank at 45° and reaches the opposite bank at a point 20 m, from the point opposite to the starting point. The breadth of the river is equal to $(\sqrt{2} = 1.414)$.

(A) 12.12 m (B) 14. 14 m

(C) 16.16 m (D) 18.18 m

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 πcm^2 (B) $66\pi cm^2$

(C) $120\pi cm^2$ (D) $136\pi cm^2$

2. If S_1 denotes the total surface area of a sphere of radius r and S_2 denotes the total surface area of a cylinder of base radius r and height $2r$, then

(A) $S_1 = S_2$ (B) $S_1 > S_2$ (C) $S_1 < S_2$ (D) $S_1 = 2S_2$

3. The ratio of the volumes of two spheres is 8: 27. If r and R are the radii of spheres Respectively, then $(R - r) : r$ is

(A) 1: 2 (B) 1: 3 (C) 2: 3 (D) 4: 9

4. The radius of a wire is decreased to one-third of the original. If volume remains the same, then the length will be increased — of the original.

(A) 3 times (B) 6 times (C) 9 times (D) 27 times

5. The height of a cone is 60 cm. A small cone is cut off at the top by a plane parallel to the base and its volume is $\left(\frac{1}{64}\right)^{\text{th}}$ the volume the original cone. The height of the smaller cone is

(A) 45 cm (B) 30 cm (C) 15 cm (D) 20 cm

6. A solid frustum is of height 8 *cm*. If the radii of its lower and upper ends are 3 *cm* and 9 *cm* respectively, then its slant height is
(A) 15 *cm* (B) 12 *cm* (C) 10 *cm* (D) 17 *cm*

7. A solid is hemispherical at the bottom and conical above. If the curved surface areas of the two parts are equal, then the ratio of its radius and the height of its conical part is
(A) 1: 3 (B) $1:\sqrt{3}$ (C) 1: 1 (D) $\sqrt{3}:1$

8. The material of a cone is converted into the shape of a cylinder of equal radius. If the height of the cylinder is 5 *cm*, then height of the cone is
(A) 10 *cm* (B) 15 *cm* (C) 18 *cm* (D) 24 *cm*

9. The curved surface area of a cylinder is 264 $m^{\angle}$ and its volume is 924 m^3. The ratio of diameter to its height is
(A) 3: 7 (B) 7: 3 (C) 6: 7 (D) 7:6

10. When Karuna divided surface area of a sphere by the sphere's volume, he got the answer as $\frac{1}{3}$. What is the radius of the sphere?
(A) 24 *cm* (B) 9 *cm* (C) 54 *cm* (D) 4.5 *cm*

11. A spherical steel ball is melted to make 8 new identical balls. Then the radius each new ball is how much times the radius of the original ball?
(A) $\frac{1}{3}$ (B) $\frac{1}{4}$ (C) $\frac{1}{2}$ (D) $\frac{1}{8}$

12. A semicircular thin sheet of a metal diameter 28 *cm* is bent and an open conical cup is made. What is the capacity of the cup?
(A) $\left(\frac{1000}{3}\right)\sqrt{3}cm^3$ (B) $300\sqrt{3}cm^3$
(C) $\left(\frac{700}{3}\right)\sqrt{3}cm^3$ (D) $\left(\frac{1078}{3}\right)\sqrt{3}\ cm^3$

13. A cone of height 9 *cm* with diameter of its base 18 *cm* is carved out from a wooden solid sphere of radius 9 *cm*. The percentage of wood wasted is
(A) 45% (B) 56 % (C) 67% (D) 75%

14. A cylinder having radius 1 m and height 5 m is completely filled with milk. In how many conical flasks can this milk be filled if the flask radius and height is 50 *cm* each?
(A)50 (B)500 (C) 120 (D)160

15. A floating boat having a length 3 m and breadth 2 m is floating on alake. The boat sinks by 1 *cm* when a man gets into it. The mass of the man is (density of water is 1000 kg/m^3)
(A) 50 kg (B) 60 kg (C) 70 kg (D) 80 kg

CHAPTER – 8 (STATISTICS AND PROBABILITY)

1. The range of first 10 prime numbers is
(A) 9 (B) 20 (C) 27 (D) 5

2. If the smallest value and co-efficient of range of a data are 25 and 0.5 respectively. Then the largest value is
(A) 25 (B) 75 (C) 100 (D) 12.5

3. If the standard deviation of a variable x is 4 and if $y = \frac{3x+5}{4}t$ then the standard deviation of y is
(A) 4 (B) 3.5 (C) 3 (D) 2.5

4. If the observations 1, 2, 3, 50 have the variance V_1 and the observations 51, 52, 53, 100 have the variance V_2 then $\frac{y_1}{y_2}$ is
(A) 2 (B) 1 (C) $\frac{1}{2}$ (D) 0

5. If the data is multiplied by 4, then the corresponding variance is get multiplied by
(A) 4 (B) 16 (C) 2 (D) None

6. If the co-efficient of variation and standard deviation of a data are 35% and 7.7 respectively then the mean is
(A) 20 (B) 30 (C) 25 (D) 22

7. The batsman A is more consistent than batsman B if
(A) C.V of $A > C.V$ of B (B) C.V of $A < C.V$ of B
(C) C.V of $A = C.V$ of B (D) C.V of $A \geq C.V$ of B

8. If an event occurs surely, then its probability is
(A) 1 (B) 0 (C) $\frac{1}{2}$ (D) $\frac{3}{4}$

9. A number x is chosen at random from $-4, -3, -2, -1, 0, 1, 2, 3, 4$. The probability that $|x| \leq 3$ is

(A) $\frac{3}{9}$ (B) $\frac{4}{9}$ (C) $\frac{2}{9}$ (D) $\frac{7}{9}$

10. A letter is selected at random from the word 'PROBABILITY'. The Probability that it is not a vowel is

(A) $\frac{4}{11}$ (B) $\frac{7}{11}$ (C) $\frac{3}{11}$ (D) $\frac{6}{11}$

11. In a competition containing two events A and B_J the probability of winning the events A and B are $\frac{1}{3}$ and $\frac{1}{4}$ respectively and the probability of winning both the events is $\frac{1}{12}$. The probability of winning only one event is

(A) $\frac{1}{12}$ (B) $\frac{5}{12}$ (C) $\frac{1}{12}$ (D) $\frac{7}{12}$

12. If the probability of non-happening of an events is q_J then the probability of happening of the event is

(A) $1-q$ (B) q (C) $\frac{q}{7}$ (D) $2q$

13. When three coins are $tossed_t$ the probability of getting the same face on all the three coins is

(A) $\frac{1}{8}$ (B) $\frac{1}{4}$ (C) $\frac{3}{8}$ (D) $\frac{1}{3}$

14. In one thousand lottery tickets, there are 50 prizes to be given. The probability of Mani winning a prize who bought one ticket is

(A) $\frac{1}{50}$ (B) $\frac{1}{100}$ (C) $\frac{1}{1000}$ (D) $\frac{1}{20}$

15. A box contains some milk chocolates and some coco chocolates and there are 60 chocolates in the box. If the probability of taking a milk chocolate is $\frac{2}{3}$ then the number of coco chocolates is

(A) 40 (B) 50 (C) 20 (D) 30

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PG – TEACHER (MATHS)

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