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HIGHER SECONDARY FIRST YEAR

MATHEMATICS

XI-STANDARD

VOLUME - I

CHAPTER 1 – Sets, Relations and Functions

ONE MARKS

Choose the correct or the most suitable answer.

1. If A = {(x,y):y = e^x,x∈ R}and B = {(x,y):y = e^{-x}, x∈ R}then n(A∩B) is

(1) Infinity (2) 0 (3) 1 (4) 2

2. If A = {(x,y):y = sinx,x ∈ R}and B = {(x,y):y = cosx,x ∈ R}then A∩B contains

(1) no element (2) infinitely many elements (3) only one element (4) cannot be determined.

3. The relation R defined on a set A = {0,−1,1,2}by xRy if$|x^2 + y^2| \leq 2$, then which one of the following is true? (1) R = {(0,0),(0,−1),(0,1),(−1,0),(−1,1),(1,2),(1,0)} (2) R−1 = {(0,0),(0,−1),(0,1),(−1,0),(1,0)}
(3) Domain of R is{0,−1,1,2} (4) Range of R is{0,−1,1}

4. If f(x)=|x−2|+|x +2 |,x∈ R, then

(1) $f(x) = \begin{cases} -2x & \text{if} \quad x \in (-\infty, -2] \\ 4 & \text{if} \quad x \in (-2, 2] \\ 2x & \text{if} \quad x \in (2, \infty) \end{cases}$ 2. $f(x) = \begin{cases} 2x & \text{if} \quad x \in (-\infty, -2] \\ 4x & \text{if} \quad x \in (-2, 2] \\ -2x & \text{if} \quad x \in (2, \infty) \end{cases}$

3. $f(x) = \begin{cases} -2x & \text{if} \quad x \in (-\infty, -2] \\ -4x & \text{if} \quad x \in (-2, 2] \\ 2x & \text{if} \quad x \in (2, \infty) \end{cases}$ 4. $f(x) = \begin{cases} -2x & \text{if} \quad x \in (-\infty, -2] \\ 2x & \text{if} \quad x \in (-2, 2] \\ 2x & \text{if} \quad x \in (2, \infty) \end{cases}$

5. Let R be the set of all real numbers. Consider the following subsets of the plane R×R:
S = {(x,y):y = x +1 and 0 <x<2}and T = {(x,y):x−y is an integer} Then which of the following is true?
(1) T is an equivalence relation but S is not an equivalence relation.
(2) Neither S nor T is an equivalence relation
(3) Both S and T are equivalence relation
(4) S is an equivalence relation but T is not an equivalence relation

6. Let A and B be subsets of the universal set N theset of natural numbers.Then A ∪[(A∩B)∪B]is
(1) A (2) A (3) B (4) N

7. The number of students who take both the subjects Mathematics and Chemistry is 70. This represents 10% of the enrollment in Mathematics and 14% of the enrollment in Chemistry. The number of students take at least one of these two subjects, is
(1) 1120 (2) 1130 (3) 1100 (4) insufficient data

8. If n((A×B)∩(A×C)) = 8 and n(B ∩C)=2, then n(A) is
(1) 6 (2) 4 (3) 8 (4) 16

9. If n(A)=2and n(B ∪C)=3, then n[(A×B)∪(A×C)] is

(1) 23 (2) 32 (3) 6 (4) 5

10. 10. If two sets A and B have 17 elements in common, then the number of elements common to the set A×B and B ×A is (1) 2^{17} (2) 17^2 (3) 34 (4) insufficient data

11. For non-empty sets A and B, ifA ⊂ B then (A×B)∩(B ×A) is equal to
(1) A∩B (2) A×A (3) B ×B (4) none of these.

12. The number of relations on a set containing 3 elements is
(1) 9 (2) 81 (3) 512 (4) 1024

13. Let R be the universal relation on a set X with more than one element. Then R is
(1) not reflexive (2) not symmetric (3) transitive (4) none of the above

14. Let X = {1,2,3,4}and R = {(1,1),(1,2),(1,3),(2,2),(3,3),(2,1),(3,1),(1,4),(4,1)}. Then R is
(1) reflexive (2) symmetric (3) transitive (4) equivalence

15. The range of the function $\frac{1}{1-2\sin x}$ is (1) $(-\infty,-1)\cup(1\ 3,\infty)$ (2) $(-1,\ 1\ 3)$ 3) $[-1,\ 1\ 3]$
(4) $(-\infty,-1]\cup[1\ 3,\infty)$.

16. The range of the function f(x)=| x −x|,x∈ R is
(1) [0,1] (2) [0,∞) (3) [0,1) (4) (0,1)

17. The rule f(x)=x2 is a bijection if the domain and the co-domain are given by
(1) R,R (2) R,(0,∞) (3) (0,∞),R (4) [0,∞),[0,∞)
18. The number of constant functions from a set containing m elements to a set containing n elements is
(1) mn (2) m (3) n (4) m + n

19. The function f : [0 ,2π] → [−1,1] defined by f(x) = sinx is (1) one-to-one (2) onto (3) bijection (4) cannot be defined

20. If the function f :[−3,3] → S defined by f(x)=x2 is onto, then S is (1) [−9,9] (2) R (3) [−3,3] (4) [0,9]

21. Let X = {1,2,3,4},Y = {a,b,c,d}and f = {(1,a),(4,b),(2,c),(3,d),(2,d)}. Then f is (1) an one-to-one function (2) an onto function (3) a function which is not one-to-one (4) not a function

22.The inverse of f(x)= $\begin{cases} x & \text{if} \quad x<1 \\ x^2 & \text{if} \quad 1\le x\le 4 \\ 8\sqrt{x} & \text{if} \quad x>4 \end{cases}$ is

1) $f^{-1}(x)=\begin{cases} x & \text{if} \quad x<1 \\ \sqrt{x} & \text{if} \quad 1\le x\le 16 \\ \frac{x^2}{64} & \text{if} \quad x>16 \end{cases}$ 2. $f^{-1}(x)=\begin{cases} -x & \text{if} \quad x<1 \\ \sqrt{x} & \text{if} \quad 1\le x\le 16 \\ \frac{x^2}{64} & \text{if} \quad x>16 \end{cases}$

3. $f^{-1}(x)=\begin{cases} x^2 & \text{if} \quad x<1 \\ \sqrt{x} & \text{if} \quad 1\le x\le 16 \\ \frac{x^2}{64} & \text{if} \quad x>16 \end{cases}$ 4. $f^{-1}(x)=\begin{cases} 2x & \text{if} \quad x<1 \\ \sqrt{x} & \text{if} \quad 1\le x\le 16 \\ \frac{x^2}{8} & \text{if} \quad x>16 \end{cases}$

23. Let f : R → R be defined by f(x)=1−|x|. Then the range of f is
(1) R (2) (1,∞) (3) (−1,∞) (4) (−∞,1]

24. The function f : R → R is defined by f(x) = sinx + cosx is
(1) an odd function (2) neither an odd function nor an even function (3) an even function
(4) both odd function and even function.

25. The function f : R → R is defined by $f(x)=\frac{(x^2+\cos x)(1+x^4)}{(x-\sin x)(2x-x^3)}+e^{-|x|}$ is
(1) an odd function (2) neither an odd function nor an even function
(3) an even function (4) both odd function and even function.

CHAPTER 2 – Basic Algebra

ONE MARKS

Choose the correct or the most suitable answer.

1. If|x +2|≤9, then x belongs to (1) (−∞,−7) (2) [−11,7] (3) (−∞,−7)∪[11,∞) (4) (−11,7)

2. Given that x,y and b are real numbers x < y,b >0, then (1) xb < yb (2) xb > yb
(3) xb ≤ yb (4) x /b ≥ y /b

3. If |x−2|/ x−2 ≥ 0, then x belongs to (1) [2,∞) (2) (2,∞) (3) (−∞,2) (4) (−2,∞)

4. The solution of 5x−1 < 24 and 5x +1> −24 is (1) (4,5) (2) (−5,−4) (3) (−5,5) (4) (−5,4)

5. The solution set of the following inequality|x−1|≥|x−3|is (1) [0,2] (2) [2,∞) (3) (0,2) (4) (−∞,2)

6. The value of $\log_{\sqrt{2}} 512$ is (1) 16 (2) 18 (3) 9 (4) 12

7. The value of $\log_3 1/81$ is (1) −2 (2) −8 (3) −4 (4) −9

8. If $\log_{\sqrt{x}} 0.25 = 4$, then the value of x is (1) 0.5 (2) 2.5 (3) 1.5 (4) 1.25

9. The value of loga b logb c logc a is (1) 2 (2) 1 (3) 3 (4) 4

10. If 3 is the logarithm of 343, then the base is (1) 5 (2) 7 (3) 6 (4) 9

11. Find a so that the sum and product of the roots of the equation 2x2 +(a−3)x +3a−5=0are equal is (1) 1 (2) 2 (3) 0 (4) 4

12. If a and b are the roots of the equation $x^2 - kx + 16 = 0$and satisfy $a^2 + b^2 = 32$, then the value of k is (1) 10 (2) −8 (3) −8,8 (4) 6

13. The number of solutions of $x^2 + |x-1| = 1$is (1) 1 (2) 0 (3) 2 (4) 3

14. The equation whose roots are numerically equal but opposite in sign to the roots of $3x^2 - 5x - 7 = 0$is (1) $3x^2 - 5x - 7 = 0$ (2) $3x^2 + 5x - 7 = 0$ (3) $3x^2 - 5x + 7 = 0$ (4) $3x^2 + x - 7$

15. If 8 and 2 are the roots of $x^2 + ax + c = 0$ and 3,3 are the roots of $x^2 + dx + b = 0$, then the roots of the equation $x^2 + ax + b = 0$ are (1) 1,2 (2) −1,1 (3) 9,1 (4) −1,2

16. If a and b are the real roots of the equation $x^2 - kx + c = 0$, then the distance between the points (a,0) and (b,0) is (1) $\sqrt{k^2 - 4c}$ (2) $\sqrt{4k^2 - c}$ (3) $\sqrt{4c - k^2}$ (4) $\sqrt{k - 8c}$

17. If $\frac{kx}{(x+2)(x-1)} = \frac{2}{x+2} + \frac{1}{x-1}, then$ the value of k is (1) 1 (2) 2 (3) 3 (4) 4

18. $\frac{1-2x}{3+2x-x^2} = \frac{A}{3-x} + \frac{B}{x+1}, then$ the value of A+B is (1) −1/ 2 (2) −2 /3 (3) 1/ 2 (4) 2/ 3

19. The number of roots of $(x + 3)^4 + (x + 5)^4 = 16$is (1) 4 (2) 2 (3) 3 (4) 0

20. The value of $\log_3 11 \cdot \log_{11} 13 \cdot \log_{13} 15 \cdot \log_{15} 27 \cdot \log_{27} 81$ is (1) 1 (2) 2 (3) 3 (4) 4

CHAPTER 3 – Trigonometry

ONE MARKS

Choose the correct or the most suitable answer.

1. $\frac{1}{\cos 80^0} - \frac{\sqrt{3}}{\sin 80^0} =$ (1) √2 (2)√3 (3) 2 (4) 4

2. If cos28◦ + sin28 ◦ = k^3, then cos17◦ is equal to (1)k^3 /√2 (2)−k^3 /√2 (3)±k^3 /√2 (4)−k^3 /√3

3. The maximum value of 4sin2 /x + 3cos 2/ x + sinx/ 2+ cosx/ 2 is (1) 4+√2 (2) 3+√2 (3) 9 (4) 4

4. $\left(1+\cos\frac{\Pi}{8}\right)\left(1+\cos\frac{3\Pi}{8}\right)\left(1+\cos\frac{5\Pi}{8}\right)\left(1+\cos\frac{7\Pi}{8}\right) =$ (1)1/ 8 (2)1 /2 (3)1 /√3 (4)1/ √2

5. If π<2θ<3π /2, then $\sqrt{2+\sqrt{2+2\cos 4\theta}}$ equals to(1)−2cosθ (2)−2sinθ (3) 2cosθ (4) 2sinθ

6.If tan40◦ = λ, then tan140◦−tan130/1 + tan140◦tan130◦= (1)1−λ2/ λ (2)1+λ2/ λ

(3)1+λ2/ 2λ (4)1−λ2 /2λ.

7. cos1◦ + cos2 ◦ + cos3 ◦ + ...+ cos179◦ = (1)0 (2) 1 (3)−1 (4) 89

8. Let $f_k(x)=1/ k[\sin^k x + \cos^k x]$-where x ∈ R and k ≥ 1. Then $f_4(x)-f_6(x)$= (1)1/ 4 (2)1/ 12 (3)1/ 6 (4)1 /3

9. Which of the following is not true? (1) sinθ = − 3 /4 (2) cosθ = −1 (3) tanθ = 25 (4) secθ =1/ 4

10. cos2θcos2ϕ + sin 2 (θ−ϕ)−sin2 (θ + ϕ) is equal to (1) sin2(θ + ϕ) (2) cos2(θ + ϕ)
(3) sin2(θ−ϕ) (4) cos2(θ−ϕ)

11. $\frac{\sin(A-B)}{\cos A\cos B}+\frac{\sin(B-C)}{\cos B\cos C}\frac{\sin(C-A)}{\cos A\cos C}is$ (1) sin2(θ + ϕ) (2) cos2(θ + ϕ)
(3) sin2(θ−ϕ) (4) cos2(θ−ϕ)

12. If cospθ + cosqθ =0and if p ≠ q, then θ is equal to (n is any integer) (1) π(3n + 1)/ p−q
(2) π(2n + 1)/p±q (3) π(n±1) /p±q (4)π(n + 2) /p + q

13. If tanα and tanβ are the roots of $x^2 + ax + b =0$, then sin(α + β)/ sinαsinβ is equal to
(1)b/ a (2)a/ b (3)−a /b (4) −b/ a

14. In a triangle ABC, $\sin^2 A + \sin^2 B + \sin^2 C =2$, then the triangle is (1) equilateral triangle
(2) isosceles triangle (3) right triangle (4) scalene triangle

15. If f(θ)=|sinθ|+|cosθ|,θ∈ R, then f(θ) is in the interval (1) [0,2] (2) [1,√2] (3) [1,2] (4) [0,1]

16. cos6x + 6cos4x + 15cos2x + 10/ cos5x + 5cos3x + 10cosx is equal to (1) cos2x (2) cosx
(3) cos3x (4) 2cosx

17. The triangle of maximum area with constant perimeter 12m
(1) is an equilateral triangle with side 4m (2) is an isosceles triangle with sides 2m,5m,5m
(3) is a triangle with sides 3m,4m,5m (4) Does not exist.

18. A wheel is spinning at 2 radians/second. How many seconds will it take to make 10 complete rotations? (1) 10π seconds (2) 20π seconds (3) 5π seconds (4) 15π seconds

19. If sinα + cosα = b, then sin2α is equal to (1) b^2 −1, if b ≤√2 (2) b^2 −1, if b>√2
(3) b^2 −1, if b ≥ 1 (4) b^2 −1, if b ≥√2

20. In a triangle ABC, if (i) sin A/ 2 sin B /2sinC/ 2> 0 (ii) sinAsinB sinC>0 then (1) Both (i) and (ii) are true (2) Only (i) is true (3) Only (ii) is true (4) Neither (i) nor (ii) is true.

CHAPTER 4 – Combinatorics and Mathematical Induction

ONE MARKS

Choose the correct or the most suitable answer:

1. The sum of the digits at the 10th place of all numbers formed with the help of 2, 4, 5, 7 taken all at a time is (1) 432 (2) 108 (3) 36 (4) 18

2. In an examination there are three multiple choice questions and each question has 5 choices . Number of ways in which a student can fail to get all answer correct is (1) 125 (2) 124 (3) 64 (4) 63

3. The number of ways in which the following prize be given to a class of 30 boys first and second in mathematics, first and second in physics, first in chemistry and first in English is
(1) $30^4 \times 29^2$ (2) $30^3 \times 29^3$ (3) $30^2 \times 29^4$ (4) 30×29^5.

4. The number of 5 digit numbers all digits of which are odd is (1) 25 (2) 5^5 (3) 5^6 (4) 625.

5. In 3 fingers, the number of ways four rings can be worn is·····ways. (1) 4^3 −1 (2) 3^4 (3) 68 (4) 64

6. If $^{(n+5)}P_{(n+1)} = (11(n-1)/2)(^{n+3})P_n$, then the value of n are
(1) 7 and 11 (2) 6 and 7 (3) 2 and 11 (4) 2 and 6.

7. The product of r consecutive positive integers is divisible by (1) r! (2) (r−1)! (3) (r + 1)! (4) r^r.

8. The number of five digit telephone numbers having at least one of their digits repeated is
(1) 90000 (2) 10000 (3) 30240 (4) 69760.

9. If $^{a2-a}C_2 = ^{a2-a}C_4$ then the value of 'a' is (1) 2 (2) 3 (3) 4 (4) 5

10. There are 10 points in a plane and 4 of them are collinear. The number of straight lines joining any two points is (1) 45 (2) 40 (3) 39 (4) 38.

11. The number of ways in which a host lady invite 8 people for a party of 8 out of 12 people of whom two do not want to attend the party together is_____

12. The number of parallelograms that can be formed from a set of four parallel lines intersecting another set of three parallel lines. (1) 6 (2) 9 (3) 12 (4) 18

13. Everybody in a room shakes hands with everybody else. The total number of shake hands is 66. The number of persons in the room is····· (1) 11 (2) 12 (3) 10 (4) 6

14. Number of sides of a polygon having 44 diagonals is····· (1) 4 (2) 4! (3) 11 (4) 22

15. If 10 lines are drawn in a plane such that no two of them are parallel and no three are concurrent, then the total number of points of intersection are (1) 45 (2) 40 (3)10! (4) 2^{10}

16. In a plane there are 10 points are there out of which 4 points are collinear, then the number of triangles formed is (1) 110 (2) $^{10}C_3$ (3) 120 (4) 116

17. In $^{2n}C_3 : ^nC_3 = 11 : 1$then n is (1) 5 (2) 6 (3)11 (4)7

18. $^{(n-1)}C_r + ^{(n-1)}C_{(r-1)}$ is (1) $^{(n+1)}C_r$ (2) $^{(n-1)}C_r$ (3) ^nC_r (4) $^nC_{r-1}$.

19. The number of ways of choosing 5 cards out of a deck of 52 cards which inclued atleast one king is

(1) $^{52}C_5$ (2) $^{48}C_5$ (3) $^{52}C_5 + ^{48}C_5$ (4) $^{52}C_5 - ^{48}C_5$.

20. The number of rectangles that a chessboard has··· (1) 81 (2) 9^9 (3)1296 (4) 6561

21. The number of 10 digit number that can be written by using the digits 2 and 3 is (1) $^{10}C_2 + ^9C_2$
(2) 2^{10} (3) $2^{10} - 2$ (4) 10

22. If Pr stands for rPr then the sum of the series 1+P1 +2P2 +3P3 +···+ nPn is (1) P_{n+1} (2) $P_{n+1} - 1$
(3) $P_{n-1} + 1$ (4) $^{(n+1)}P_{(n-1)}$

23. The product of first n odd natural numbers equals (1) $^{2n}C_n \times ^nP_n$ (2) $(1/2)^n \times ^{2n}C_n \times ^nP_n$
(3) $(1/4)^n \times ^{2n}C_n \times ^{2n}P_n$ (4) $^nC_n \times ^nP_n$

24. If $^nC_4$, $^nC_5$, $^nC_6$ are in AP the value of n can be (1) 14 (2) 11 (3)9 (4)5

25. 1+3+5+7+···+ 17is equal to (1) 101 (2) 81 (3) 71 (4) 61

CHAPTER 5 – Binomial Th eorem, Sequences And Seriest

ONE MARKS

Choose the correct or the most suitable answer:

1. The value of 2+4+6+···+2n is (1) n(n−1) /2 (2) n(n+1)/ 2 (3) 2n(2n+1)/ 2 (4) n(n + 1)

2. The co-efficient of x^6 in $(2 + 2x)^{10}$ is (1) $^{10}C_6$ (2) 26 (3) $^{10}C_6$ 26 (4) $^{10}C_6\, 2^{10}$.

3. The coefficient of x^8y^{12} in the expansion of $(2x + 3y)^{20}$ is (1) 0 (2) 2^83^{12} (3) $2^83^{12} + 2^{12}3^8$ (4) $^{20}C_8\, 2^83^{12}$.

4. If $nC_{10} > nC_r$ for all possible r, then a value of n is (1) 10 (2) 21 (3) 19 (4) 20.

5. If a is the arithmetic mean and g is the geometric mean of two numbers, then
(1) $a \le g$ (2) $a \ge g$ (3) $a = g$ (4) $a > g$.

6. If $(1 + x^2)^2 (1 + x)n = a0 + a1x + a2x^2 + \cdots + x^{n+4}$ and if a0,a1,a2 are in AP, then n is
(1) 1 (2) 2 (3) 3 (4) 4.

7. If a,8,bare in AP, a,4,bare in GP, and if a,x,b are in HP then x is (1) 2 (2) 1 (3) 4 (4) 16.

8. The sequence $1/\sqrt{3}, 1/\sqrt{3}+\sqrt{2}, 1/\sqrt{3}+2\sqrt{2}, \cdots$ form an (1) AP (2) GP (3) HP (4) AGP.

9. The HM of two positive numbers whose AM and GM are 16, 8 respectively is (1) 10 (2) 6 (3) 5 (4) 4.

10. If Sn denotes the sum of n terms of an AP whose common difference is d, the value of $S_n - 2S_{n-1} + S_{n-2}$ is (1) 0 (2) 2d (3) 4d (4) d^2.

11. The remainder when 38^{15} is divided by 13 is (1) 12 (2) 1 (3) 11 (4) 5.

12. The n^{th} term of the sequence 1,2,4,7,11,$\cdots$is (1) $n^3 + 3n^2 + 2n$ (2) $n^3 - 3n^2 + 3n$
(3) $n(n+1)(n+2)/3$ (4) $n^2 - n + 2/2$.

13. The sum up to n terms of the series $1/\sqrt{1}+\sqrt{3} + 1/\sqrt{3}+\sqrt{5} + 1/\sqrt{5}+\sqrt{7} + \cdots$is
(1) $\sqrt{2n} + 1$ (2) $\sqrt{2n+1}/2$ (3) $\sqrt{2n} + 1 - 1$ (4) $\sqrt{2n+1} - 1$

14. The n^{th} term of the sequence 1/ 2, 3/ 4, 7/ 8, 15/ 16,$\cdots$is (1) $2^n - n - 1$ (2) $1 - 2^{-n}$
(3) $2^{-n} + n - 1$ (4) 2^{n-1}.

15. The sum up to n terms of the series$\sqrt{2}+\sqrt{8}+\sqrt{18} + \sqrt{32} + \cdots$is
(1) n(n+1)/ 2 (2) 2n(n + 1) (3) n(n+1) /2 (4) 1.

16. The value of the series 1 /2 + 7/ 4 + 13/ 8 + 19 /16 +$\cdots$is (1) 14 (2) 7 (3) 4 (4) 6.

17. The sum of an infinite GP is 18. If the first term is 6, the common ratio is
(1) 1/ 3 (2) 2/ 3 (3) 1/ 6 (4) 3/4.

18. The coefficient of x^5 in the series e^{-2x} is (1) 2/ 3 (2) 3 /2 (3) −4 /15 (4) 4 /15

19. The value of 1/ 2! + 1/ 4! + 1/ 6! +$\cdots$is (1) $e^2 + 1/2e$ (2) $(e+1)^2/2e$
(3) $(e-1)^2/2e$ (4) $e^2 + 1/2e$.

20. The value of $1 - \frac{1}{2}\left(\frac{2}{3}\right) + \frac{1}{3}\left(\frac{2}{3}\right)^2 - \frac{1}{4}\left(\frac{2}{3}\right)^3 + \cdots$ 1. $\log\left(\frac{5}{3}\right)$ 2. $\frac{3}{2}\log\left(\frac{5}{3}\right)$

3. $\frac{5}{3}\log\left(\frac{5}{3}\right)$ 4. $\frac{2}{3}\log\left(\frac{2}{3}\right)$.

CHAPTER 6 – Two Dimensional Analytical Geometry

ONE MARKS

Choose the correct or the most suitable answer:

1. Theequationofthelocusofthepointwhosedistancefromy-axisishalfthedistancefromoriginis
(1) $x^2 + 3y^2 = 0$ (2) $x^2 - 3y^2 = 0$ (3) $3x^2 + y^2 = 0$ (4) $3x^2 - y^2 = 0$

2. Which of the following equation is the locus of $(at^2, 2at)$

(1) $x^2/a^2 - y^2/b^2 = 1$ (2) $x^2 a^2 + y^2 b^2 = 1$ (3) $x^2 + y^2 = a^2$ (4) $y^2 = 4ax$

3. Which of the following point lie on the locus of $3x^2 + 3y^2 - 8x - 12y + 17 = 0$
(1) (0,0) (2) (−2,3) (3) (1,2) (4) (0,−1)

4. If the point (8,−5) lies on the locus $x^2/16 - y^2/25 = k$, then the value of k is (1) 0 (2) 1 (3) 2 (4) 3

SHRI NEHRU VIDYALAYA MHSS, COIMBATORE-02

5. Straight line joining the points (2,3) and (−1,4) passes through the point (α,β) if
(1) α +2β = 7 (2) 3α + β = 9 (3)α +3β = 11 (4) 3α + β = 11

6. The slope of the line which makes an angle 45◦ with the line 3x−y = −5 are
(1) 1,−1 (2) 1/ 2 ,−2 (3) 1, 1/ 2 (4) 2,−1/ 2

7. Equationofthestraightlinethatformsanisoscelestrianglewithcoordinateaxesintheı-quadrant with perimeter 4+2√2 is (1) x + y +2=0 (2) x + y−2=0 (3) x + y−√2=0 (4) x + y +√2=0

8. The coordinates of the four vertices of a quadrilateral are (−2,4), (−1,2), (1,2) and (2,4) taken in order.The equation of the line passing through the vertex (−1,2) and dividing the quadrilateral in the equal areas is (1) x+ 1 = 0 (2) x + y = 1 (3) x + y +3=0 (4) x−y +3=0

9. The intercepts of the perpendicular bisector of the line segment joining (1, 2) and (3,4) with coordinate axes are (1) 5,−5 (2) 5, 5 (3) 5, 3 (4) 5,−4

10. The equation of the line with slope 2 and the length of the perpendicular from the origin equal to √5 is (1) x +2y = √5 (2) 2x + y = √5 (3) 2x + y =5 (4) x +2y−5=0

11. A line perpendicular to the line 5x−y =0forms a triangle with the coordinate axes. If the area of the triangle is 5 sq. units, then its equation is
(1) x+ 5y±5√2=0 (2) x−5y±5√2=0 (3) 5x+y±5√2=0 (4) 5x−y±5√2=0

11. A line perpendicular to the line 5x−y =0forms a triangle with the coordinate axes. If the area of the triangle is 5 sq. units, then its equation is (1) x+ 5y±5√2=0 (2) x−5y±5√2=0
(3) 5x+y±5√2=0 (4) 5x−y±5√2=0

12. Equationofthestraightlineperpendiculartothelinex−y+5 = 0,throughthepointofintersection the y-axis and the given line (1) x−y−5=0 (2) x + y−5=0 (3) x + y +5=0 (4) x + y + 10 = 0

13. If the equation of the base opposite to the vertex (2, 3) of an equilateral triangle is x + y = 2, then the length of a side is (1) 3/ 2 (2) 6 (3) √6 (4) 3√2

14. The line (p +2 q)x +(p−3q)y = p−q for different values of p and q passes through the point
(1) [3/ 2,5 /2] (2) [2/ 5,2/ 5] (3) [3 /5,3/ 5] (4) [2/ 5,3/ 5]

15. The point on the line 2x−3y =5 is equidistance from (1,2) and (3,4) is
(1) (7,3) (2) (4,1) (3) (1,−1) (4) (−2,3)

16. The image of the point (2, 3) in the line y = −x is (1) (−3,−2) (2) (−3, 2) (3) (−2,−3) (4) (3, 2)

17. The length of⊥from the origin to the line x/ 3 −y/ 4=1 , is(1)11/ 5 (2)5/ 12 (3)12/ 5 (4) −5/ 12

18. The y-intercept of the straight line passing through (1,3) and perpendicular to 2x−3y +1=0is
(1) 3 /2 (2) 9/ 2 (3) 2 /3 (4) 2/ 9

19. If the two straight lines x + (2k−7)y +3=0and 3kx+9y−5=0are perpendicular then the value of k is
(1) k =3 (2) k = 1/ 3 (3) k = 2 /3 (4) k = 3 /2

20. If a vertex of a square is at the origin and its one side lies along the line 4x +3 y −20 = 0, thenthe area of the square is (1) 20 sq. units (2) 16 sq. units (3) 25 sq. units (4) 4 sq.units

21. If the lines represented by the equation $6x^2 + 41xy−7y^2$ =0make angles α and β with x- axis, then tanαtanβ = (1) – 6/ 7 (2) 6/ 7 (3)− 7/ 6 (4) 7/ 6

22. The area of the triangle formed by the lines x2 −4y2 =0and x = a is
(1) $2a^2$ (2) √3 /2 a^2 (3) 1/ 2 a^2 (4)2/ √3a^2

23. If one of the lines given by $6x^2$ −xy +4cy^2 =0 is 3x +4y =0 ,, then c equals to

(1)−3 (2)−1 (3) 3 (4) 1

24. θ is acute angle between the lines $x^2 - xy - 6y^2 = 0$, then $2\cos\theta + 3\sin\theta / 4\sin\theta + 5\cos\theta$ is
(1) 1 (2) −1/ 9 (3) 5/ 9 (4) 1/ 9

25. The equation of one the line represented by the equation $x^2 + 2xy\cot\theta - y^2 = 0$ is
(1) $x - y\cot\theta = 0$ (2) $x + y\tan\theta = 0$ (3) $x\cos\theta + y(\sin\theta + 1) = 0$ (4) $x\sin\theta + y(\cos\theta + 1) = 0$

ANSWERS

UNIT-I

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
3	2	4	1	1	4	2	2	3	2	2	3	3	2	4
(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)					
3	4	3	2	4	4	1	4	2	3					

UNIT-II

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
2	1	1	3	2	2	3	1	2	2	2	3	3	2	3
(16)	(17)	(18)	(19)	(20)										
1	3	1	1	4										

UNIT-III

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
4	1	1	1	4	4	1	2	4	2	3	2	3	3	2
(16)	(17)	(18)	(19)	(20)										
4	1	1	1	1										

UNIT-IV

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
2	2	1	2	4	2	1	4	2	2	3	4	2	3	1
(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)					
4	2	3	4	3	2	2	2	1	2					

UNIT-V

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
4	4	4	4	2	3	1	3	4	1	1	4	4	2	3
(16)	(17)	(18)	(19)	(20)										
2	2	3	3	2										

UNIT-VI

SHRI NEHRU VIDYALAYA MHSS, COIMBATORE-02

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
4	4	3	4	3	2	2	4	2	3	1	2	3	4	2
(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)					
1	3	2	1	2	1	3	1	3	4					

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