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X - STD	2019 - 2020	Marks : 50	Time : 1.00 : Hr.
ONE MARK	MATHEMATICS		
TEST NO : 1	1. Relations and Functions, 2. Numbers and Sequences		

I. Choose the correct answers from given alternatives : **50 x 1 = 50**

1. $f(x) = (x+1)^3 - (x-1)^3$ represents a function which is .....
(a) Linear (b) Cubic (c) Reciprocal (d) Quadratic

2. If the sequence t_1, t_2, t_3 ..... are in A.P. then the sequence t_6, t_{12}, t_{18}, ... is ..... (a) a Geometric Progression (b) an Arithmetic Progression
(c) Neither an Arithmetic Progression nor a Geometric Progression
(d) a constant sequence

3. If $n(A \times B) = 6$ and $A = \{1, 3\}$ then n (B) is .... (a) 1 (b) 2 (c) 3 (d) 6

4. If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + \ + \ 2^0$ 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

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

6. 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

7. $A = \{a, b, p\}$, $B = \{2, 3\}$, $C = \{p, q, r, s\}$ then $n[(A \cup C) \times B]$ is .....
(a) 8 (b) 20 (c) 12 (d) 16

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. Let $f(x) = \sqrt{1+x^2}$ then .....
(a) $f(xy) = f(x).f(y)$ (b) $f(xy) \geq f(x).f(y)$ (c) $f(xy) < f(x).f(y)$ (d) none of these

10. $7^{4k} \equiv$ ..... (mod 100) ..... (a) 1 (b) 2 (c) 3 (d) 4

11. 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) $(D \times A) \subset (B \times A)$

12. The sum of the exponents of the prime factors in the factorization of 1729 is ..... (a) 1 (b) 2 (c) 3 (d) 4

13. 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 $f_o g$ is .....
(a) $\{0, 2, 3, 4, 5\}$ (b) $\{-4, 1, 0, 2, 7\}$ (c) $\{1, 2, 3, 4, 5\}$ (d) $\{0, 1, 2\}$

14. 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

15. 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

16. 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) $0 < r \leq b$

17. 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

18. 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

19. ..... $R = \{(x, x^2) \mid x$ 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) $\{1, 4, 9, 25, 49, 121\}$

20. The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is ..... (a) 2025 (b) 5220 (c) 5025 (d) 2520

21. 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) $\frac{1}{6x^2}$

22. 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

23. 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) $(3, -2)$

24. 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

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25. 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

26. 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

27. 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}

28. The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}$ ... is ..... (a) $\frac{1}{24}$ (b) $\frac{1}{27}$ (c) $\frac{2}{3}$ (d) $\frac{1}{81}$

29. 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)

30. The value of $(1^3 + 2^3 + 3^3 + ... + 15^3) - (1 + 2 + 3 + ... + 15)$ is .....
(a) 14400 (b) 14200 (c) 14280 (d) 14520

31. Let A = {1, 3, 4, 7, 11}, B = {– 1, 1, 2, 5, 7, 9} and $f: A \to B$ be given by $f = \{(1, -1), (3, 2), (4, 1), (7, 5), (11, 9)\}$. Then 'f' is .....
(a) one-one (b) onto (c) bijective (d) not a function

32. The 8th term of the sequence 1, 1, 2, 3, 5, 8, ... is .....
(a) 25 (b) 24 (c) 23 (d) 21

33. If $\{(7, 11), (5, a)\}$ represents a constant function, then the value of 'a' is ..... (a) 7 (b) 11 (c) 5 (d) 9

34. If $a_1, a_2, a_3, a_4, a_5, a_6, a_7$ are in A.P. and if $a_4 = 10$, then $a_1 + a_7$ is equal to ..... (a) 5 (b) 10 (c) 15 (d) 20

35. If $A = \{5, 6, 7\}$, $B = \{1, 2, 3, 4, 5\}$ and $f: A \to B$ is defined by $f(x) = x - 2$, then the range of 'f' is .....
(a) {1, 4, 5} (b) {1, 2, 3, 4, 5} (c) {2, 3, 4} (d) {3, 4, 5}

36. If the n^{th} term of a sequence is $100n + 10$, then the sequence is .....
(a) an A.P. (b) a G.P. (c) a constant sequence (d) neither A.P. nor G.P.

37. Given $f(x) = (-1)^x$ is a function from $\mathbf{N}$ to $\mathbf{Z}$. Then the range of 'f' is ..... (a) {1} (b) $\mathbf{N}$ (c) {1, – 1} (d) $\mathbf{Z}$

38. The common difference of an A.P. whose 4th term is 19 and 7th term is 28 is ..... (a) 2 (b) 3 (c) 4 (d) 5

39. If $f(x) = x^2 + 5$, then $f(-4)$ = ... (a) 26 (b) 21 (c) 20 (d) – 20

40. If a, b, c, l, m, n are in A.P., then $3a + 7, 3b + 7, 3c + 7, 3l + 7, 3m + 7, 3n + 7$ form .....
(a) a G.P. (b) an A.P. (c) a constant sequence (d) neither A.P. nor G.P.

41. If $f = \{(6, 3), (8, 9), (5, 3), (-1, 6)\}$, then the pre-images of 3 are .....
(a) 5 and – 1 (b) 6 and 8 (c) 8 and – 1 (d) 6 and 5

42. When $x = 2$ the value of $1 + x + x^2 + ... + x^9$ is .....
(a) 511 (b) 1023 (c) 513 (d) 1025

43. If the range of a function is a singleton set, then it is .....
(a) a constant function (b) an identity function
(d) a bijective function (d) an one-one function

44. The sequence – 3, – 3, – 3, ... is .....
(a) an A.P. only (b) a G.P. only (c) neither A.P. nor G.P. (d) both A.P. and G.P.

45. If $n(A) = 20$, $n(B) = 30$ and $n(A \cup B) = 40$, then $n(A \cap B)$ is equal to .....
(a) 50 (b) 10 (c) 40 (d) 70

46. The value of 3 + 6 + 9 + ... + 60 is equal to .....
(a) 510 (b) 570 (c) 600 (d) 630

47. If $f: A \to B$ is a bijective function and if $n(A) = 5$, then $n(B)$ is equal to ..... (a) 10 (b) 4 (c) 5 (d) 25

48. If the n^{th} term of an A.P. is $t_n = 3 - 5n$, then the sum of the first n terms is ..... (a) $\frac{n}{2}[1 - 5n]$ (b) $n(1 - 5n)$ (c) $\frac{n}{2}(1 - 5n)$ (d) $\frac{n}{2}(1 + n)$

49. If $\{(x, 2), (4, y)\}$ represents an identity function, then (x, y) is .....
(a) (2, 4) (b) (4, 2) (c) (2, 2) (d) (4, 4)

50. If $2 + 4 + 6 + ... + 2k = 90$, then the value of 'k' is .....
(a) 8 (b) 9 (c) 10 (d) 11

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X - STD	2019 - 2020	Marks : 50	1.00 : Hr.
ONE MARK	MATHEMATICS		
TEST NO : 2	3. Algebra		

I. Choose the correct answers from given alternatives : **50 x 1 = 50**

1. Find the matrix X if $2X+\begin{bmatrix}1&3\\5&7\end{bmatrix}=\begin{bmatrix}5&7\\9&5\end{bmatrix}$
(a) $\begin{bmatrix}-2&-2\\2&-1\end{bmatrix}$ (b) $\begin{bmatrix}2&2\\2&-1\end{bmatrix}$ (c) $\begin{bmatrix}1&2\\2&2\end{bmatrix}$ (d) $\begin{bmatrix}2&1\\2&2\end{bmatrix}$

2. The values 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

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

4. Graph of a linear polynomial is a .....
(a) Straight line (b) Circle (c) Parabola (d) Hyperbola

5. 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

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

7. For the given matrix $A=\begin{bmatrix}1&3&5&7\\2&4&6&8\\9&11&13&15\end{bmatrix}$ the order of the matrix A^T is .....
(a) 2 × 3 (b) 3 × 2 (c) 3 × 4 (d) 4 × 3

8. $\frac{3y-3}{y}\div\frac{7y-7}{3y^2}$ is ..... (a) $\frac{9y}{7}$ (b) $\frac{9y^3}{(21y-21)}$ (c) $\frac{21y^2-42y+21}{3y^3}$ (d) $\frac{7(y^2-2y+1)}{y^2}$

9. If $\begin{pmatrix}8&4\\x&8\end{pmatrix}=4\begin{pmatrix}2&1\\1&2\end{pmatrix}$ then the value of 'x' is ..... (a) 1 (b) 2 (c) $\frac{1}{4}$ (d) 4

10. 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

11. The square root of $121x^4y^8z^6\ (l-m)^2$ is .....
(a) $11x^2y^4z^4|l-m|$ (b) $11x^4y^4|z^3\ (l-m)|$ (c) $11x^2y^4z^6\ |l-m|$ (d) $11x^2y^4|z^3\ (l-m)|$

12. $\frac{x}{x^2-25}-\frac{8}{x^2+6x+5}$ 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) $\frac{x^2+10}{(x^2-25)(x+1)}$

13. If $A\times\begin{pmatrix}1&1\\0&2\end{pmatrix}=(1\quad 2)$ then the order of 'A' is .....
(a) 2 X 1 (b) 2 X 2 (c) 1 X 2 (d) 3 X 2

14. If $\begin{pmatrix}1&2\\2&1\end{pmatrix}\begin{pmatrix}x\\y\end{pmatrix}=\begin{pmatrix}2\\4\end{pmatrix}$, then the values of '$x$' and '$y$' respectively, are .....
(a) 2, 0 (b) 0, 2 (c) 0, – 2 (d) 1, 1

15. 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) $-8x^2$

16. The square root of $x^2 + y^2 + z^2 - 2xy + 2yz - 2zx$ .....
(a) $|x+y-z|$ (b) $|x-y+z$ (c) $x+y+z|$ (d) $|x-y-z|$

17. The equation $x^2 + 2x + k = 0$ and $x^2 + 4x - k = 0$ have a common root α. Then the value of 'k' is .....
(a) α (b) $-\alpha$ (c) 3α (d) -3α

18. If $b = a + c$, then the equation $ax^2 + bx + c = 0$ has .....
(a) Real roots (b) No roots (c) Equal roots (d) No real roots

19. If α and α^2 are roots of the equation $x^2 - bx + 8 = 0$ then the value of 'b' is ..... (a) 2 (b) 4 (c) 6 (d) 8

20. The square root of $49\ (x^2 - 2xy + y^2)^2$ is .....
(a) $7\ |x-y|$ (b) $7\ (x+y)\ (x-y)$ (c) $7\ (x+y)^2$ (d) $7\ (x-y)^2$

21. If $x = 1$ is a zero of the polynomial $p(x) = x^4 - 2x^3 + 3x^2 - 4x + \lambda$, then the value of '$\lambda$' is ..... (a) 2 (b) – 2 (c) 3 (d) – 3

22. If α and β are the roots of $ax^2 + bx + c = 0$, then one of the quadratic equations whose roots are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$, is .....
(a) $ax^2 + bx + c = 0$ (b) $bx^2 + ax + c = 0$ (c) $cx^2 + bx + a = 0$ (d) $cx^2 + ax + b = 0$

23. If $\frac{1}{\alpha}$ is a root of the equation $2x^2 - 5x + 7 = 0$, then the value of $7a^2 - 5a$ is ..... (a) 2 (b) – 2 (c) 5 (d) – 5

24. The sum of two zeros of the polynomial $f(x) = 2x^2 + (p + 3)x + 5$ is zero, then the value of 'p' is ..... (a) 3 (b) 4 (c) – 3 (d) – 4

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25. If $(0, -1)$ is the unique solution of the equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$, then ..... (a) $\frac{a_1}{a_2} = \frac{b_1}{b_2}$ (b) $\frac{a_1}{a_2} \neq \frac{c_1}{c_2}$ (c) $\frac{b_1}{b_2} = \frac{c_1}{c_2}$ (d) $\frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

26. If α, β are the roots of $ax^2 + bx + c = 0$ $a \neq 0$, then the wrong statement is ..... (a) $\alpha^2 + \beta^2 = \frac{b^2 - 2ac}{a^2}$ (b) $\alpha\beta = \frac{c}{a}$ (c) $\alpha + \beta = \frac{b}{a}$ (d) $\alpha - \beta = \frac{b^2 - 4ac}{a}$

27. Transpose of a column matrix is .....
(a) Unit matrix (b) Diagonal matrix (c) Column matrix (d) Row matrix

28. If one zero of the polynomial $p(x) = (k + 4)x^2 + 13x + 3k$ is reciprocal of the other, then 'k' is equal to ..... (a) 2 (b) 3 (c) 4 (d) 5

29. 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

30. The common root of the equations $x^2 - bx + c = 0$ and $x^2 + bx - a = 0$ is ..... (a) $\frac{c+a}{2b}$ (b) $\frac{c-a}{2b}$ (c) $\frac{c+b}{2a}$ (d) $\frac{a+b}{2c}$

31. 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

32. The system of equations $x - 4y = 8$, $3x - 12y = 24$ .....
(a) has infinitely many solutions (b) has no solution
(c) has a unique solution (d) may or may not have a solution

33. 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

34. A quadratic equation whose one root is 3 is .....
(a) $x^2 - 6x - 5 = 0$ (b) $x^2 + 6x - 5 = 0$ (c) $x^2 - 5x - 6 = 0$ (d) $x^2 - 5x + 6 = 0$

35. The solution of $(2x - 1)^2 = 9$ is equal to .....
(a) -1 (b) 2 (c) $-1, 2$ (d) None of these

36. If $\alpha + \beta = 14$ and $\alpha - \beta = 2\sqrt{3}$, then $\alpha\beta$ = ...
(a) 42 (b) 44 (c) 46 (d) 48

37. 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) $\frac{16}{5}\left|\frac{xz^2}{y}\right|$

38. If $x^2 + \frac{1}{x^2} = 23$, $x > 0$, then $x + \frac{1}{x}$ is ..... (a) 2 (b) 3 (c) 4 (d) 5

39. $y^2 + \frac{1}{y^2}$ 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) $\left(y + \frac{1}{y}\right)^2 - 2$

40. The value of 'a' for which the roots α, β of the equation $x^2 - 2x + a = 0$ satisfy the condition $\alpha - \beta = 6$ is .....
(a) 4 (b) -4 (c) 8 (d) -8

41. A system of two linear equations in two variables is inconsistent, if their graphs ..... (a) Coincide (b) Intersect only at a point
(c) Do not intersect at any point (d) Cut the x-axis

42. If $\frac{9}{y} + \frac{4}{x} = \frac{12}{\sqrt{xy}}$, where $x > 0$, $y > 0$, then $3\sqrt{x} - 2\sqrt{y}$ .....
(a) 5 (b) 1 (c) 2 (d) 0

43. If $x^2 + 5kx + 16 = 0$ has no real roots, then .....
(a) $k > \frac{8}{5}$ (b) $k > -\frac{8}{5}$ (c) $-\frac{8}{5} < k < \frac{8}{5}$ (d) $0 < k < \frac{8}{5}$

44. 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

45. The number of zeros (real numbers) of the polynomial $p(x) = x^2 + 1$ is ..... (a) 0 (b) 1 (c) 2 (d) 3

46. 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) $x = 1, y = 2, z = 3$

47. The value of 'a' for which the system $ax - 6y = 12$, $2x - 6y = 15$ has no solutions is .....
(a) 1 (b) 2 (c) 3 (d) 4

48. 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

49. The roots of the equation $(x + 3)^2 - 9 = 0$ are .....
(a) $(0, -6)$ (b) $(-3, -6)$ (c) $(0, -3)$ (d) $(3, -3)$

50. If the system $6x - 2y = 3$, $kx - y = 2$ has a unique solution, then .....
(a) $k = 3$ (b) $k \neq 3$ (c) $k = 4$ (d) $k \neq 4$

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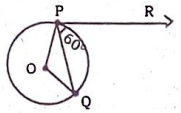
ONE MARK	MATHEMATICS		
TEST NO : 3	4. Geometry 5. Co-ordinate Geometry		

I. Choose the correct answers from given alternatives : **50 x 1 = 50**

1. 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° (b) 100° (c) 110° (d) 90°

2. 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

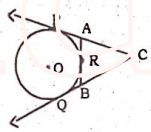
(c) l_2 and l_4 are perpendicular (d) l_2 and l_3 are parallel

3. The perimeter of two similar triangles ΔABC and ΔDEF are 36 cm and 24 cm respectively. If DE = 10 cm, then AB is .....

(a) 12 cm (b) 20 cm (c) 15 cm (d) 18 cm

4. Slope of the line joining the points (3, - 2) and (– 1, a) is $-\frac{3}{2}$, then the value of 'a' is equal to ..... (a) 1 (b) 2 (c) 3 (d) 4

5. 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) 5 cm (c) 8 cm (d) 4 cm

6. 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) $y = 5$

7. In ΔABC, AB = 6 cm and AD is the angle bisector of $\angle A$. If $BD : DC = 3 : 2$, then AC = ... (a) 4 cm (b) 6 cm (c) 3 cm (d) 8 cm

8. The point $\left(0, \frac{-7}{3}\right)$ divides a line segment joining two points A and B internally in the ratio 2 : 1. If A is (2, – 3), then the point B is .....

(a) (2, 1) (b) (– 2, – 1) (c) (2, – 1) (d) (– 1, – 2)

9. 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° (b) 110° (c) 120° (d) 130°

10. The area of the triangle formed by the points (0, 0), $\left(\frac{46}{7}, 0\right)$ and $\left(0, \frac{21}{23}\right)$ is ..... (a) 1 (b) 2 (c) 3 (d) 4

11. The perimeter of two similar triangles are 24 cm and 18 cm respectively. If one side of the first triangle is 8 cm, then the corresponding side of the other triangle is .....

(a) 4 cm (b) 3 cm (c) 9 cm (d) 6 cm

12. The slope of the line which is perpendicular to line joining the points (0, 0) and (– 8, 8) is ..... (a) – 1 (b) 1 (c) $\frac{1}{3}$ (d) – 8

13. How many tangents can be drawn to the circle from an exterior point ? ..... (a) One (b) Two (c) Infinite (d) Zero

14. If (1, 2), (4, 6), (x, 6) and (3, 2) are the vertices of a parallelogram taken in order, then the value of 'x' is ..... (a) 6 (b) 2 (c) 1 (d) 3

15. The distance between the tops of two vertical poles of height 6 m and 11 m standing on the same plane at a distance of 12 m is .....

(a) 7 m (b) 13 m (c) 9 m (d) 10 m

16. 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)

17. A tangent is perpendicular to the radius at the .....

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

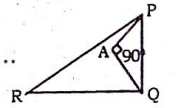
18. The y-intercept of the line $5x = 3y$ is ..... (a) $\frac{5}{3}$ (b) $\frac{3}{5}$ (c) 0 (d) $-\frac{5}{3}$

19. If $\Delta ABC \sim \Delta PQR$ and area (ΔPQR) = 4 area (ΔABC), then $AB : PQ$ is .....

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

20. The point of intersection of the straight lines $9x - y - 2 = 0$ and $2x + y - 9 = 0$ is ..... (a) (– 1, 7) (b) (7, 1) (c) (1, 7) (d) (– 1, – 7)

21. 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° (b) 85° (c) 75° (d) 90°

22. 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)

23. Triangles ABC and DEF are similar. If their areas are 100 cm^2 and 49 cm^2 respectively and BC is 8.2 cm then EF = ...

(a) 5.47 cm (b) 5.74 cm (c) 6.47 cm (d) 6.74 cm

24. The angle of inclination of the straight line $5y = 5x + 10$ is .....

(a) 0° (b) 30° (c) 60° (d) 45°

25. 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

26. 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

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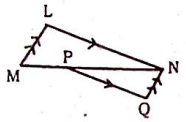
27. In the figure, $LM \parallel NQ$ and $LN \parallel PQ$. Which one of the following is true ? .....

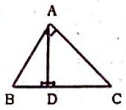


(a) $\Delta LMN \sim \Delta NQP$ (b) $\Delta QNP \sim \Delta MNL$
(c) $\Delta LNM \sim \Delta QNP$ (d) $\Delta LMN \sim \Delta QNP$

28. 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

29. In the adjacent figure $\angle BAC = 90^0$ and $AD \perp BC$ then ..... (a) $BD.CD = BC^2$ (b) $AB.AC = BC^2$ (c) $BD.CD = AD^2$ (d) $AB.AC = AD^2$



30. (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) $x + 3y - 3 = 0$; $x - y - 7 = 0$

31. 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

32. 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) $y = 0$

33. If in ΔABC, $DE \parallel BC$. $AB = 3.6$ 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

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

(a) 3 (b) 6 (c) 9 (d) 12

35. The areas of two similar triangles are 16 cm^2 and 36 cm^2 respectively. If the altitude of the first triangle is 3 cm, then the corresponding altitude of the other triangle is .....

(a) 6.5 cm (b) 6 cm (c) 4 cm (d) 4.5 cm

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

(a) 1 (b) 4 (c) – 5 (d) 2

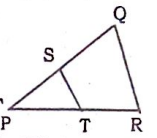
37. The perimeters of two similar triangles ΔABC and ΔPQR are 36 cm and 24 cm respectively. If $PQ = 10$ cm, then the length of AB is .....

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

38. The slope of a straight line parallel to the line $2x + 4y + 5 = 0$ is .....

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

39. 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



40. If slope of the line PQ is $\frac{1}{\sqrt{3}}$ then the slope of the perpendicular bisector of PQ is ..... (a) $\sqrt{3}$ (b) $-\sqrt{3}$ (c) $\frac{1}{\sqrt{3}}$ (d) 0

41. If ABC is an isosceles, right triangle, right angled at C, then .....

(a) $AB^2 = 2AC^2$ (b) $AC^2 = 2AB^2$ (c) $BC^2 = 2CA^2$ (d) $AC^2 = 2BC^2$

42. The equation of a straight line passing through the point (2, – 7) and parallel to x-axis is ..... (a) $x = 2$ (b) $x = -7$ (c) $y = -7$ (d) $y = 2$

43. If ΔABC is an isosceles triangle with $\angle C = 90^0$ and AC = 5 cm, then AB is ..... (a) 2.5 cm (b) 5 cm (c) 10 cm (d) $5\sqrt{2}$ cm

44. 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) $7x - 3y = 0$

45. In ΔLMN, $\angle L = 60^0$, M = 50^0. If $\Delta LMN \sim \Delta PQR$ then the value of $\angle R$ is ..... (a) 40^0 (b) 70^0 (c) 30^0 (d) 110^0

46. If a straight line $y = 2x + k$ passes through the point (1, 2), then the value of 'k' is equal to ..... (a) 0 (b) 4 (c) 5 (d) – 3

47. The sides of two similar triangles are in the ratio 2 : 3, then their areas are in the ratio ..... (a) 9 : 4 (b) 4 : 9 (c) 2 : 3 (d) 3 : 2

48 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

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

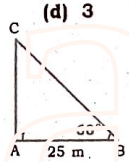
(a) $\angle B = \angle E$ (b) $\angle A = \angle D$ (c) $\angle B = \angle D$ (d) $\angle A = \angle F$

50. 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

X - STD	2019 - 2020	Marks : 50	1.00 : Hr.
ONE MARK	MATHEMATICS		
TEST NO : 4	6. Trigonometry		

I. Choose the correct answers from given alternatives : 50 x 1 = 50

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. $(1 + \tan^2\theta)(1 - \sin\theta)(1 + \sin\theta)$ = ...
   (a) $\cos^2\theta - \sin^2\theta$ (b) $\sin^2\theta - \cos^2\theta$ (c) $\sin^2\theta + \cos^2\theta$ (d) 0
3. $\tan\theta\operatorname{cosec}^2\theta - \tan\theta$ is equal to .....
   (a) $\sec\theta$ (b) $\cot^2\theta$ (c) $\sin\theta$ (d) $\cot\theta$
4. $9\tan^2\theta - 9\sec^2\theta$ = ... (a) 1 (b) 0 (c) 9 (d) – 9
5. If $(\sin\alpha + \operatorname{cosec}\alpha)^2 + (\cos\alpha + \sec\alpha)^2 = k + \tan^2\alpha + \cot^2\alpha$, then the value of '$k$' is equal to ..... (a) 9 (b) 7 (c) 5 (d) 3
6. In the adjoining figure, AC = ...
   (a) 25 m (b) $25\sqrt{3}$ m (c) $\frac{25}{\sqrt{3}}$ m (d) $25\sqrt{2}$ m
   

7. If $\sin\theta + \cos\theta = a$ and $\sec\theta + \operatorname{cosec}\theta = b$, then the value of $b(a^2 - 1)$ is equal to ..... (a) $2a$ (b) $3a$ (c) 0 (d) $2ab$
8. $(\cos^2\theta - 1)(\cot^2\theta + 1) + 1$ = ... (a) 1 (b) – 1 (c) 2 (d) 0
9. If $5x = \sec\theta$ and $\frac{5}{x} = \tan\theta$, then x^2 is equal to .....
   (a) 25 (b) $\frac{1}{25}$ (c) 5 (d) 1
10. $\frac{\sin^3\theta+\cos^3\theta}{\sin\theta+\cos\theta}$ = ... (a) 1 (b) $1 - \sin\theta\cos\theta$ (c) $\sin\theta + \cos\theta$ (d) $\tan\theta$
11. $\sin^21^0 + \sin^22^0 + \ldots + \sin^290^0$ = ... (a) 90 (b) 45 (c) 46 (d) 45.5
12. If $\sin\theta = \cos\theta$, then $2\tan^2\theta + \sin^2\theta - 1$ is equal to .....
    (a) $\frac{-3}{2}$ (b) $\frac{3}{2}$ (c) $\frac{2}{3}$ (d) $\frac{-2}{3}$
13. $\frac{\sqrt{1-\sin^2\theta}}{\sin\theta}$ = ... (a) $\cot\theta$ (b) $\frac{\sin\theta}{2}$ (c) $\tan\theta$ (d) $\frac{1+\sin\theta}{\sin^2\theta}$
14. $\sec\theta\sqrt{1-\sin^2\theta}$ = ... (a) $\cos\theta$ (b) 1 (c) 0 (d) $\sec\theta$
15. If $x = a\tan\theta$ and $y = b\sec\theta$ then .....
    (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) $\frac{x^2}{a^2}-\frac{y^2}{b^2}=0$
16. $\frac{\sin 60^0}{\sin 30^0}(1 + \cos 60^0)$ = ... (a) $\sqrt{3}+\frac{\sqrt{3}}{2}$ (b) $\frac{1}{\sqrt{3}}+\frac{1}{2}$ (c) $\frac{5}{\sqrt{2}}+\frac{1}{2}$ (d) $1+\frac{1}{\sqrt{2}}$
17. $2(\sin^260^0 + \cos^230^0) - (\sin^245^0 + \cos^245^0)$ is .....
    (a) 3 (b) 2 (c) 1 (d) 0
18. $\frac{\operatorname{cosec}^2150-1}{\operatorname{cosec}15^0}$ = ... (a) $\sin 15^0$ (b) $\cos 15^0$ (c) $2+\sqrt{3}$ (d) $\frac{-1-\sqrt{2}}{2}$
19. $(\tan^2\theta - \sin^2\theta)(\cot^2\theta - \cos^2\theta)$ = ...
    (a) 1 (b) $\sin^2\theta\cos^2\theta$ (c) 0 (d) $\tan^2\theta - \cot^2\theta$
20. $\cos\theta\sqrt{1+\tan^2\theta}\sin+\theta\sqrt{1+\cot^2\theta}$ = ...
    (a) 2 (b) 1 (c) $\operatorname{cosec}\theta$ (d) $\sec\theta$
21. $\cos(90^0 - \theta)\operatorname{cosec}\theta + \sin(90^0 - \theta)\sec\theta$ = ... (a) 1 (b) 0 (c) 2 (d) – 1
22. $\tan(90^0 - \theta)\tan\theta + \cot(90^0 - \theta)\cot\theta$ = ...
    (a) $\tan 45^0$ (b) $\operatorname{cosec} 60^0$ (c) $\sec 60^0$ (d) $\cot 30^0$
23. $\sin^2A\cos^2B - \cos^2A\sin^2B$ is .....
    (a) $\sin^2A$ (b) $\sin^2B$ (c) $\sin^2A - \sin^2B$ (d) $\sin^2A - \cos^2B$
24. $(\tan 7^0)(\tan 23^0)(\tan 60^0)(\tan 67^0)(\tan 83^0)$ is .....
    (a) 0 (b) 7 (c) 1 (d) $\sqrt{3}$
25. $\cos(90^0 - \theta)\cos\theta - \sin(90^0 - \theta)\sin\theta$ = ...
    (a) $\sin 90^0$ (b) $\cot 45^0$ (c) $\operatorname{cosec} 45^0$ (d) $\cos 90^0$
26. If $A + B = 90^0$, then $\cos A\sin B + \sin A\cos B$ is equal to .....
    (a) 2 (b) 1 (c) 0 (d) 45^0
27. $\operatorname{cosec}^267^0 - \tan^223^0$ = ... (a) 0 (b) 1 (c) – 1 (d) 2
28. $\frac{\sin^3\theta}{\cos\theta} + \sin\theta\cos\theta$ = ... (a) $\sin\theta$ (b) $\cos\theta$ (c) $\tan\theta$ (d) $\cot\theta$
29. If the length of the shadow of a tower is $\frac{1}{\sqrt{3}}$ times that of its height then the angle of elevation of the sun is .....
    (a) 30^0 (b) 45^0 (c) 60^0 (d) 90^0
30. $\frac{1+\sin\theta}{\cos\theta}$ = ... (a) $\frac{\cos\theta}{1-\sin\theta}$ (b) $\frac{\sin\theta}{1+\cos\theta}$ (c) $\frac{1+\sin\theta}{1-\sin\theta}$ (d) $\frac{1-\sin\theta}{1+\sin\theta}$
31. $\frac{\sec^4\theta-\tan^4\theta}{\sec^2\theta+\tan^2\theta}$ = ... (a) 1 (b) $\sec^2\theta\tan^2\theta$ (c) 2 (d) $\sin^2\theta\cos^2\theta$

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32. $\frac{1}{\tan\theta+\cot\theta}$ = ... (a) $\sin\theta+\cos\theta$ (b) $\sin\theta\cos\theta$ (c) $\sin\theta-\cos\theta$ (d) $\operatorname{cosec}\theta+\cot\theta$

33. $(1+\tan\theta+\sec\theta)(1+\cot\theta-\operatorname{cosec}\theta)$ is equal to .....

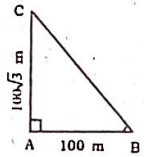
(a) 0 (b) 1 (c) 2 (d) – 1

34. $a\cot\theta+b\operatorname{cosec}\theta=p$ and $b\cot\theta+a\operatorname{cosec}\theta=q$ then p^2-q^2 is equal to ..... (a) a^2-b^2 (b) b^2-a^2 (c) a^2+b^2 (d) $b-a$

35. $\sin^2 20^0+\sin^2 70^0-\tan 45^0$ ..... (a) 1 (b) 0 (c) 2 (d) – 1

36. In the adjoining figure $\angle ABC$ = ...

(a) 45° (b) 30° (c) 60° (d) 50°



37. 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° (b) 30° (c) 90° (d) 60°

38. If a right triangle ABC, $\angle B = 90^0$, $\sin A=\frac{1}{3}$ and $BC = 11$, then AC = ...

(a) $\frac{11}{3}$ (b) $\sqrt{120}$ (c) 33 (d) $\sqrt{118}$

39. 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 tower is 60°. The height of the tower (in metres) is equal to ..... (a) $\sqrt{3}\,b$ (b) $\frac{b}{3}$ (c) $\frac{b}{2}$ (d) $\frac{b}{\sqrt{3}}$

40. A man is 28.5 m away from a tower. His eye level above the ground is 1.5 m. The angle of elevation of the tower from his eyes is 45°. Then the height of the tower is .....

(a) 30 m (b) 27.5 m (c) 28.5 m (d) 27 m

41. $\frac{\sin\theta-\sin^3\theta}{\cos\theta-\cos^3\theta}$ = ... (a) $\tan^2\theta$ (b) $\cot^2\theta$ (c) $\tan\theta$ (d) $\cot\theta$

42. A tower is 60 m height. Its shadow is 'x' metres shorter when the sun's altitude is 45° than when it has been 30°, then 'x' is equal to .....

(a) 41.92 m (b) 43.92 m (c) 43 m (d) 45.6 m

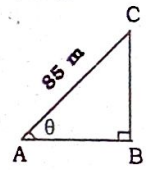
43. $\frac{1+\tan^2\theta}{1+\cot^2\theta}$ = ... (a) $\cos^2\theta$ (b) $\tan^2\theta$ (c) $\sin^2\theta$ (d) $\cot^2\theta$

44. 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 buildings (in metres) is .....

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

45. In the adjoining figure, $\sin\theta=\frac{15}{17}$. Then BC = ...

(a) 85 m (b) 65 m (c) 95 m (d) 75 m



46. $\sin^2\theta+\frac{1}{1+\tan^2\theta}$ = ...

(a) $\operatorname{cosec}^2\theta+\cot^2\theta$ (b) $\operatorname{cosec}^2\theta-\cot^2\theta$ (c) $\cot^2\theta-\operatorname{cosec}^2\theta$ (d) $\sin^2\theta-\cos^2\theta$

47. 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 persons (in metres) is .....

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

48. $(1-\cos^2\theta)(1+\cot^2\theta)$ = ...

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

49. $(1+\cot^2\theta)(1-\cos\theta)(1+\cos\theta)$ = ...

(a) $\tan^2\theta-\sec^2\theta$ (b) $\sin^2\theta-\cos^2\theta$ (c) $\sec^2\theta-\tan^2\theta$ (d) $\cos^2\theta-\sin^2\theta$

50. 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) $\frac{h(1+\tan\beta)}{1-\tan\beta}$ (b) $\frac{h(1-\tan\beta)}{1+\tan\beta}$ (c) $h\tan(45^0-\beta)$ (d) none of these

X - STD	2019 - 2020	Marks : 50	1.00 : Hr.
ONE MARK	MATHEMATICS		
TEST NO : 5	7. Mensuration 8. Statistics & Probability		

I. Choose the correct answers from given alternatives : **50 x 1 = 50**

1. 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

2. 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) $\frac{4}{5}$

3. The total surface area of a solid right circular cylinder whose radius is half of its height 'h' is equal to .....
(a) $\frac{3}{2}\pi h$ sq.units (b) $\frac{2}{3}\pi h^2$ sq.units (c) $\frac{3}{2}\pi h^2$ sq.units (d) $\frac{2}{3}\pi h$ sq.units

4. Which of the following is not a measure of dispersion ? .....
(a) Range (b) Standard deviation (c) Arithmetic mean (d) Variance

5. 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 (b) $6\pi r^2$ sq.units (c) $3\pi r^2$ sq.units (d) $8\pi r^2$ sq.units

6. 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) $\frac{3}{26}$

7. Two right circular cones have equal radii. If their slant heights are in the ratio 4 : 3, then their respectively curved surface areas are in the ratio ..... (a) 16 : 9 (b) 8 : 6 (c) 4 : 3 (d) 3 : 4

8. The range of the data 8, 8, 8, 8, 8, ... 8 is .....
(a) 0 (b) 1 (c) 8 (d) 3

9. 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) $\frac{20}{3}\pi$

10. Kamalam went to play a lucky draw contest. 135 tickets of the lucky draw were sold. If the probability of Kamalam winning is $\frac{1}{9}$, then the number of tickets bought by Kamalam is .....
(a) 5 (b) 10 (c) 15 (d) 20

11. If the surface area of a sphere is 36 π cm^2, then the volume of the sphere is equal to .....
(a) 12 π cm^3 (b) 36 π cm^3 (c) 72 π cm^3 (d) 108 π cm^3

12. The sum of all deviations of the data from its mean is .....
(a) Always positive (b) Always negative (c) Zero (d) Non-zero integer

13. The total surface area of a solid hemisphere whose radius is a units, is equal to .....
(a) $2\pi a^2$ sq.units (b) $3\pi a^2$ sq.units (c) $3\pi a$ sq.units (d) $3a^2$ sq.units

14. 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

15. 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 (b) 1 : 4 (c) 1 : 6 (d) 1 : 8

16. The mean of 100 observations is 40 and their standard deviation is 3. The sum of squares of all deviations is .....
(a) 40000 (b) 160900 (c) 160000 (d) 30000

17. If the total surface area a solid right circular cylinder is 200 π cm^2 and its radius is 5 cm, then the sum of its height and radius is .....
(a) 20 cm (b) 25 cm (c) 30 cm (d) 15 cm

18. 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) $\frac{7}{9}$

19. A frustum of a right circular cone is of height 16 cm with radii of its ends as 8 cm and 20 cm. Then, the volume of the frustum is .....
(a) 3328 π cm^3 (b) 3228 π cm^3 (c) 3240π cm^3 (d) 33[illegible] cm^3

20. Variance of first 20 natural numbers is .....
(a) 32.25 (b) 44.25 (c) 33.25 (d) 30

21. The total surface area of a solid hemisphere of diameter [illegible]m is equal to ..... (a) 12 cm^2 (b) 12 π cm^2 (c) 4π cm^2 (d) 3π cm^2

22. The probability a red marble selected at random from a j[illegible] 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) $\frac{p+r}{p+q+r}$

[PTO

23. 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 π cm³ (b) 11200 π cm³ (c) 56 π cm³ (d) 3600 π cm³

24. 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

25. 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

26. Which of the following is incorrect ? .....
(a) $P(A) > 1$ (b) $0 \le P(A) \le 1$ (c) $P(\phi) = 0$ (d) $P(A) + P(\bar{A}) = 1$

27. The curved surface area of a right circular cylinder whose radius is 'a' units and height is 'b' units, is equal to .....
(a) $\pi a^2 b$ sq.cm (b) $2\pi ab$ sq.cm (c) 2π sq.cm (d) 2 sq.cm

28. 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) $9p + 15$

29. The total surface area of a hemi-sphere is how much times the square of its radius ..... (a) π (b) 4 π (c) 3 π (d) 2 π

30. 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) 3.5

31. 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) frustum of a cone and a hemisphere

32. The least value in a collection of data is 14.1. The range of the collection is 28.4. Then the greatest value of the collection is .....
(a) 42.5 (b) 43.5 (c) 42.4 (d) 42.1

33. A solid sphere of radius 'x' cm is melted and cast into a shape of solid cone of same radius. The height of the cone is .....
(a) $3x$ cm (b) x cm (c) $4x$ cm (d) $2x$ cm

34. If ϕ is an impossible event, then $P(\phi)$ = ...
(a) 1 (b) $\frac{1}{4}$ (c) 0 (d) $\frac{1}{2}$

35. If the height and the base area of a right circular cone are 5 cm and 48 sq.cm respectively, then the volume of the cone is equal to .....
(a) 240 cm³ (b) 120 cm³ (c) 80 cm³ (d) 480 cm³

36. The probabilities of three mutually exclusive events A, B and C are given by $\frac{1}{3}, \frac{1}{4}$ and $\frac{5}{12}$. Then $P(A \cup B \cup C)$ is .....
(a) $\frac{19}{12}$ (b) $\frac{11}{12}$ (c) $\frac{7}{12}$ (d) 1

37. 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

38. For a collection of 11 items, $\Sigma x = 132$, then the arithmetic mean is ....
(a) 11 (b) 12 (c) 14 (d) 13

39. The surface areas of two spheres are in the ratio of 9 : 25. Then their volumes are in the ratio .....
(a) 81 : 625 (b) 729 : 15625 (c) 27 : 75 (d) 27 : 125

40. Variance of the first 11 natural numbers is .....
(a) $\sqrt{5}$ (b) $\sqrt{10}$ (c) $5\sqrt{2}$ (d) 10

41. 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

42. The probability that a student will score centum in mathematics is $\frac{4}{5}$. The probability that he will not score centum is .....
(a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) $\frac{3}{5}$ (d) $\frac{4}{5}$

43. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be .....
(a) 12 cm (b) 10 cm (c) 13 cm (d) 5 cm

44. For any collection of n items, $(\Sigma x) - \bar{x}$ = ...
(a) $n\bar{x}$ (b) $(n-2)\bar{x}$ (c) $(n-1)\bar{x}$ (d) 0

45. If the radius of a sphere is half of the radius of another sphere, then their respective volumes are in the ratio .....
(a) 1 : 8 (b) 2 : 1 (c) 1 : 2 (d) 8 : 1

46. A fair die is thrown once. The probability of getting a prime or composite number is .....
(a) 1 (b) 0 (c) $\frac{5}{6}$ (d) $\frac{1}{6}$

47. The height and radius of the cone of which the frustum is a part are h_1 units and r_1 units respectively. Height of the frustum 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

48. There are 6 defective items in a sample of 20 items. One item is drawn at random. The probability that it is a non-defective item is ....
(a) $\frac{7}{10}$ (b) 0 (c) $\frac{3}{10}$ (d) $\frac{2}{5}$

49. The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is .....
(a) 60 π cm² (b) 68 π cm² (c) 120 π cm² (d) 136 π cm²

50. If the standard deviation of a set of data is 1.6, then the variance is ....
(a) 0.4 (b) 2.56 (c) 1.96 (d) 0.04

X - SAMACHEER - ONE MARK TEST - KEYS, 2019 - 2020

MATHEMATICS

Mathematics - One Mark Test No : 1

I.	1. (d)	2. (b)	3. (c)	4. (d)	5. (b)	6. (c)	7. (c)	8. (c)	9. (c)	10. (a)
	11. (a)	12. (c)	13. (d)	14. (a)	15. (b)	16. (c)	17. (a)	18. (b)	19. (c)	20. (d)
	21. (c)	22. (d)	23. (d)	24. (a)	25. (c)	26. (c)	27. (c)	28. (b)	29. (a)	30. (c)
	31. (a)	32. (d)	33. (b)	34. (d)	35. (d)	36. (a)	37. (c)	38. (b)	39. (b)	40. (b)
	41. (d)	42. (b)	43. (a)	44. (d)	45. (b)	46. (d)	47. (c)	48. (a)	49. (a)	50. (b)

Mathematics - One Mark Test No : 2

I.	1. (b)	2. (c)	3. (b)	4. (a)	5. (a)	6. (b)	7. (d)	8. (a)	9. (d)	10. (b)
	11. (d)	12. (c)	13. (c)	14. (a)	15. (b)	16. (d)	17. (a)	18. (a)	19. (c)	20. (d)
	21. (a)	22. (c)	23. (b)	24. (c)	25. (c)	26. (c)	27. (d)	28. (a)	29. (b)	30. (a)
	31. (b)	32. (a)	33. (b)	34. (d)	35. (c)	36. (c)	37. (d)	38. (d)	39. (b)	40. (d)
	41. (c)	42. (d)	43. (c)	44. (b)	45. (a)	46. (a)	47. (b)	48. (d)	49. (a)	50. (b)

Mathematics - One Mark Test No : 3

I.	1. (a)	2. (c)	3. (c)	4. (d)	5. (d)	6. (a)	7. (a)	8. (d)	9. (b)	10. (c)
	11. (d)	12. (b)	13. (b)	14. (a)	15. (b)	16. (c)	17. (b)	18. (c)	19. (c)	20. (c)
	21. (d)	22. (b)	23. (b)	24. (d)	25. (a)	26. (b)	27. (c)	28. (c)	29. (c)	30. (b)
	31. (b)	32. (a)	33. (a)	34. (c)	35. (d)	36. (d)	37. (d)	38. (c)	39. (a)	40. (b)
	41. (a)	42. (c)	43. (d)	44. (c)	45. (b)	46. (a)	47. (b)	48. (a)	49. (c)	50. (a)

Mathematics - One Mark Test No : 4

I.	1. (b)	2. (c)	3. (d)	4. (d)	5. (b)	6. (b)	7. (a)	8. (d)	9. (b)	10. (b)
	11. (d)	12. (b)	13. (a)	14. (b)	15. (a)	16. (a)	17. (b)	18. (b)	19. (b)	20. (a)
	21. (b)	22. (c)	23. (c)	24. (d)	25. (d)	26. (b)	27. (b)	28. (c)	29. (c)	30. (a)
	31. (a)	32. (b)	33. (c)	34. (b)	35. (b)	36. (c)	37. (d)	38. (c)	39. (b)	40. (a)
	41. (d)	42. (b)	43. (b)	44. (d)	45. (d)	46. (b)	47. (b)	48. (c)	49. (c)	50. (a)

Mathematics - One Mark Test No : 5

I.	1. (d)	2. (d)	3. (c)	4. (c)	5. (a)	6. (c)	7. (c)	8. (a)	9. (a)	10. (c)
	11. (b)	12. (c)	13. (b)	14. (b)	15. (b)	16. (b)	17. (a)	18. (b)	19. (a)	20. (c)
	21. (d)	22. (b)	23. (b)	24. (d)	25. (b)	26. (a)	27. (b)	28. (b)	29. (c)	30. (a)
	31. (d)	32. (a)	33. (c)	34. (c)	35. (c)	36. (d)	37. (c)	38. (b)	39. (d)	40. (b)
	41. (a)	42. (a)	43. (a)	44. (c)	45. (a)	46. (c)	47. (b)	48. (a)	49. (d)	50. (b)

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