MATHEMATICS

ہر چیپٹر کے شروع میں ایک لنک دیا گیا ہے۔جس پر کلک کرنے سے آپ اس چیپٹر کے کسی بھی MCQS کو سمجھ سکتے ہیں

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UNIT # 01 Number Systems

Each question has four possible answer. Tick the correct answer.

1. For any complex number z, it is always true that $|z|$ is equal to:

(a) $|\overline{z}|$ (b) $|-z|$ (c) $|-\overline{z}|$ (d) ✔ all of these

2. The numbers which can be written in the form of $\frac{p}{q}, p, q \in Z, q \neq 0$ are :

(a) ✔Rational number (b) Irrational number (c) Complex number (d) Whole number

3. A decimal which has a finite numbers of digits in its decimal part is called_____ decimal.

(a) ✔Terminating (b) Non-Terminating (c) Recurring (d) Non recurring

4. 5.333 …. Is

(a) Rational (b) Irrational (c) an integer (d) a prime number

5. π is

(a) Rational (b) ✔ Irrational (c) Natural number (d) None

6. $\frac{22}{7}$ is

(a) ✔Rational (b) Irrational (c) an integer (d) a whole number

7. Multiplicative inverse of $'0'$ is

(a) 0 (b) any real number (c) ✔ not defined (d) 1

8. If a is any non-zero real number, then multiplicative inverse is

(a) $-a$ (b) ✔ $\frac{1}{a}$ (c) $-\frac{1}{a}$ (d) not defined

9. For all $a \in R$, $a = a$ is …. Property.

(a) ✔Reflexive (b) Symmetric (c) Transitive (d) Trichotomy

10. For all $a, b \in R$, $a = b \Rightarrow b = a$ is called….. property.

(a) Reflexive (b) ✔ Symmetric (c) Transitive (d) Trichotomy

11. Golden rule of fraction is that for $k \neq 0, \frac{a}{b} =$

(a) ✔$\frac{ka}{kb}$ (b) $\frac{ab}{l}$ (c) $\frac{ka}{b}$ (d) $\frac{kb}{b}$

12. The set $\{1, -1\}$ possesses closure property $w.r.t$

(a) $'+'$ (b) ✔ $'\times'$ (c) $'\div'$ (d) $'-'$

13. If $a < b$ then

(a) $a < b$ (b) $\frac{1}{a} < \frac{1}{b}$ (c) ✔ $\frac{1}{a} > \frac{1}{b}$ (d) $a - b > 0$

14. The additive identity in set of complex number is

(a) ✔$(0,0)$ (b) $(0,1)$ (c) $(1,0)$ (d) $(1,1)$

15. The multiplicative identity of complex number is

(a) $(0,0)$ (b) $(0,1)$ (c) ✔ $(1,0)$ (d) $(1,1)$

16. The modulus of $\overline{z} = a + ib$ is

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

17. i^{13} equals:

(a) ✔i (b) $-i$ (c) 1 (d) -1

18. The multiplicative inverse of $(4, -7)$ is:

(a) $(-\frac{4}{65}, -\frac{7}{65})$ (b) $(-\frac{4}{65}, \frac{7}{65})$ (c) $(\frac{4}{65}, -\frac{7}{65})$ (d) ✔$(\frac{4}{65}, \frac{7}{65})$

19. $(0,3)(0,5) =$

(a) 15 (b) ✔-15 (c) $-8i$ (d) $8i$

20. $(-1)^{-\frac{21}{2}} =$

(a) i (b) ✔ $-i$ (c) 1 (d) -1

21. $\sqrt{3}$ is _____

(a) Rational (b) ✔ Irrational (c) Integer (d) Prime

22. Product $\sqrt{-2} \times \sqrt{-2}$ is equal to _____

(a) -2 (b) ✔2 (c) 0 (d) 4

23. The imaginary part of the complex number (b, a) is _____

(a) ✔a (b) b (c) ia (d) None of these

24. If $z = -1 - i$ then $\overline{z} =$_____

(a) $(-1,-1)$ (b) ✔$(-1,1)$ (c) $(1,-1)$ (d) $(1,1)$

25. The property $7.8 + (-7.8) = 0$ is_____

(a) Commutative (b)'.' inverse (c) ✔ ' + ' inverse (d) Associative

26. If $x = 0$ then multiplicative inverse of x is

(a) 0 (b) 1 (c) $\frac{1}{x}$ (d) ✔ None of these

27. $(-i)^{15}$ =_____

(a) 1 (b) -1 (c) ✔ i (d) – i

28. If z_1 and z_2 are complex numbers then $|z_1+z_2|$ is _____

(a) $<|z_1+z_2|$ (b) ✔ $\leq|z_1|+|z_2|$ (c) $\geq |z_1+z_2|$ (d) None of these

29. A recurring decimal represents_____

(a) Real number (b) Natural number (c) ✔Rational number (d) None of these

30. Every recurring decimal is

(a) a rational number (b) an irrational number (c) a prime number (d) a whole number

31. Imaginary part of $(-2 + 3i^3)$ is

(a) -2 (b) 9 (c) 26 (d) ✔ -3

32. The product of two conjugate complex numbers is

(a) ✔A real number (b) an imaginary number (c) may be an irrational number (d) not defined

33. $(0, 1)^3$ is equal to:

(a) ✔1 (b) -1 (c) i (d) – i

34. If n is an even integer, then $(i)^n$ is equal to:

(a) ✔i (b) – i (c) ± 1 (d) 1

35. Factors of $3(x^2 + y^2)$ are:

(a) $3(x + y)(x - y)$ (b) ✔ $3(x + iy)(x - iy)$ (c) $\sqrt{3}(x + iy)(x - iy)$ (d) None of these

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UNIT # 02 Sets, Functions and Groups

Each question has four possible answer. Tick the correct answer.

1. If $x \in L \cup M$ then

(a) $x \notin L \; or \; x \notin M$ (b) $x \notin L \; or \; x \in M$ (c) $x \in L \; or \; x \notin M$ (d) ✔$x \in L \; or \; x \in M$

2. Total number of subsets that can be formed from the set $\{x, y, z\}$ is

(a) 1 (b) ✔ 8 (c) 5 (d)2

3. If $x \in B' = U - B$ then

(a) $x \in B \; and \; x \in U$ (b) ✔$x \notin B \; and \; x \in U$ (c) $x \notin B \; and \; x \notin U$ (d)$x \in B \; and \; x \notin U$

4. $L \cup M = L \cap M$then L is equal to

(a) ✔M (b) L (c) φ (d) M'

5. A set is a collection of objects which are

(a) Well defined (b) ✔Well defined and distinct (c) identical (d) not defined

6. The set of odd numbers between 1 and 9 are

(a) $\{1,3,5,7\}$ (b) $\{3,5,7,9\}$ (c) $\{1,3,5,7,9\}$ (d) ✔$\{3,5,7\}$

7. Every recurring non terminating decimal represents

(a) ✔Q (b) Q' (c) R (d) None

8. A diagram which represents a set is called_____

(a) ✔Venn's (b) Argand (c) Plane (d) None

9. $R - \{0\}$ is a group $w.r.t$ the binary operation

(a) + (b) ✔ × (c) ÷ (d)–

10. In a proposition if $p \rightarrow q \; then \; q \rightarrow p$ is called

(a) Inverse of $p \rightarrow q$ (b) ✔ converse of $p \rightarrow q$ (c) contrapositive of $p \rightarrow q$(d) None

11. If A and B are disjoint sets , then $A \cap B =$

(a) 0 (b) 1 (c) 2 (d) ✔ φ

12. $p \rightarrow q$ is called converse of

(a) $\sim pq$ (b) ✔ $p \rightarrow q$ (c) $q \rightarrow q$ (d) $\sim q \rightarrow p$

13. If $A \subseteq B$ then $n(A \cap B) =$
(a) ✔$n(A)$ (b) $n(B)$ (c) $n(A) + n(B)$ (d) $n(A).n(B)$

14. Inverse of any element of a group is:
(a) Not unique (b) ✔unique (c) has many inverses (d) none of these

15. Every function is:
(a) ✔Relation (b) inverse function (c) one to one (d) none of these

16. The number of all subsets of a set having three elements is:
(a) 4 (b) 6 (c) ✔ 8 (d) 10

17. The graph of linear function is :
(a) Circle (b) ✔straight line (c) parabola (d) triangle

18. Identity element in $(C, .)$ is:
(a) (0,0) (b) (0,1) (c) ✔ (1,0) (d) $(1,1)$

19. Squaring a number is a:
(a) ✔Unary operation (b) binary operation (c) relation (d) Function

20. Which of the following is true:
(a) $N \subset Z$ (b) $Z \subset Q$ (c) $Q \subset R$ (d) ✔all of these

21. Set of integers is a group $w.r.t$
(a) ✔Addition (b) multiplication (c) subtraction (d) division

22. If $A = \varphi$ then $P(A) =$
(a) Empty set (b) $\{0\}$ (c) ✔ $\{\varphi\}$ (d) none of these

23. If A and B are disjoint sets then :
(a) ✔$A \cap B = \varphi$ (b) $A \cap B \neq \varphi$ (c) $A \subset B$ (d) $A - B = \varphi$

24. The set of non-zero real numbers $w.r.t$ multiplication is:
(a) Groupied (b) Semi-group (c) Monoied (d) ✔ Group

25. Which of the following is not a binary operation :
(a) $+$ (b) $\times$ (c) ✔ $\surd$ (d) –

26. If $y = \sqrt{x}, x \geq 0$ is a function, then its inverse is:
(a) A line (b) a parabola (c) a point (d) ✔ not a function

27. An onto function is also called:
(a) Injective (b) ✔ Surjective (c) Bijective (d) Inverse

28. A $(1-1)$ function is also called:
(a) ✔Injective (b) Surjective (c) Bijective (d) Inverse

29. For the propositions p and q, $(p \wedge q) \rightarrow p$ is:
(a) ✔Tautology (b) Absurdity (c) contingency (d) None of these

30. For the propositions p and q , $p \rightarrow (p \vee q)$ is:
(a) ✔Tautology (b) Absurdity (c) Contingency (d) None of these

31. If set A has 2 elements and B has 4 elements , then number of elements in $A \times B$ is :
(a) 6 (b) ✔ 8 (c) 16 (d) None of these

32. Inverse of a line is :
(a) ✔A line (b) a parabola (c) a point (d) not defined

33. The function $f = \{(x, y), y = x\}$ is :
(a) ✔Identity function (b) Null function (c) not a function (d) similar function

34. If $y = \sqrt{x}, x \geq 0$ is a function, then its inverse is :
(a) A line (b) a parabola (c) a point (d) ✔ not defined

35. Truth set of a tautology is
(a) ✔Universal set (b) φ (c) True (d) False

36. A compound proposition which is always true is called:
(a) ✔Tautology (b) contradiction (c) absurdity (d) contingency

37. A compound proposition which is always neither true nor false is called:
(a) Tautology (b) contradiction (c) absurdity (d) ✔ contingency

38. A compound proposition which is always wrong is called:
(a) Tautology (b) ✔ contradiction (c) absurdity (d) contingency

39. If $S = \{\ \}$, then order of set S is:
(a) ✔0 (b) 1 (c) Infinite set (d) not defined

40. The symbol which is used to denote negation of a proposition is
(a) ✔$\sim$ (b) $\rightarrow$ (c) $\wedge$ (d) $\vee$

41. Which of the following is true:
(a) $\varphi - A = \varphi$ (b) $A \cup A = A$ (c) $A \cap A = A$ (d) ✔All of these

42. Which of the following is true:
(a) $A \cup \varphi = A$ (b) $A \cap \varphi = \varphi$ (c) $A - \varphi = A$ (d) ✔All of these

43. If $B \subseteq A$, then $n(B - A)$ is equal to:
(a) $n(A)$ (b) $n(B)$ (c) $n(A \cap B)$ (d) ✔ 0

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UNIT # 03 Matrices and Determinants

Each question has four possible answer. Tick the correct answer.

1. A rectangular array of numbers enclosed by a square brackets is called:
(a) ✔Matrix (b) Row (c) Column (d) Determinant

2. The horizontal lines of numbers in a matrix are called:
(a) Columns (b) ✔ Rows (c) Column matrix (d) Row matrix

3. The vertical lines of numbers in a matrix are called:
(a) ✔Columns (b) Rows (c) Column matrix (d) Row matrix

4. If a matrix A has m rows and n columns , then order of A is :
(a) ✔$m \times n$ (b) $n \times m$ (c) $m + n$ (d) m^n

5. The element a_{ij} of any matrix A is present in:
(a) ✔i^{th} row and j^{th} column (b)i^{th} column and j^{th} row
(c) $(i+j)^{th}$ row and column (d) $(i+j)^{th}$ row and column

6. A matrix A is called real if all a_{ij} are
(a) ✔Real numbers (b) complex numbers (c) 0 (d) 1

7. If a matrix A has only one row then it is called:
(a) ✔Row vector (b) Column vector (c) square matrix (d) Rectangle matrix

8. If a matrix A has only one column then it is called:
(a) Row vector (b) ✔ Column vector (c) square matrix (d) Rectangle matrix

9. If a matrix A has same number of rows and columns then A is called:
(a) Row vector (b) Column vector (c) ✔square matrix (d) Rectangular matrix

10. If a matrix A has different number of rows and columns then A is called:
(a) Row vector (b) Column vector (c) square matrix (d) ✔ Rectangular matrix

11. For the square matrix $A = [a_{ij}]_{n \times n}$ then $a_{11}, a_{22}, a_{33 \ldots} a_{nn}$ are:
(a) ✔Main diagonal (b) primary diagonal (c) proceding diagonal (d) secondary diagonal

12. For a square matrix $A = [a_{ij}]$ if all $a_{ij} = 0, i \neq j$ and all $a_{ij} = k(non - zero)$ for $i = j$ then A is called:
(a) Diagonal matrix (b) ✔ Scalar Matrix (c) Scalar Matrix (d) Null matrix

13. For a square matrix $A = [a_{ij}]$ if all $a_{ij} = 0, i \neq j$ and at least $a_{ij} \neq 0,\ i = j$ then A is called:
(a) ✔Diagonal matrix (b) Scalar Matrix (c) Scalar Matrix (d) Null matrix

14. The matrix $[7]$ is :
(a) Square matrix (b) row matrix (c) column matrix (d) ✔ all of these

15. If a matrix of order $m \times n$ then the matrix of order $n \times m$ is :
(a) ✔Transpose of A (b) Inverse of A (c) Main diagonal of A (d) Adjoint of A

16. For any two matrices A and B ,$(A + B)^t =$
(a) $B^t A^t$ (b) $A^t B^t$ (c) ✔$A^t + B^t$ (d) $B^t + A^t$

17. Let A be a matrix and n is an integer then $A + A + A + \cdots$ to n terms
(a) ✔nA (b) $n + A$ (c) $n - A$ (d) A^n

18. If order of A is $m \times n$ and order of B is $n \times q$ then order of AB is
(a) $m \times n$ (b) $n \times m$ (d) $n \times q$ (d) ✔$m \times q$

19. If $adj\ A = \begin{bmatrix} -1 & -2 \\ 3 & 4 \end{bmatrix}$ then matrix A is

(a) $\begin{bmatrix} -1 & -2 \\ 4 & 3 \end{bmatrix}$ (b) $\begin{bmatrix} 4 & 2 \\ 3 & -1 \end{bmatrix}$ (c) $\begin{bmatrix} -4 & 3 \\ -2 & -1 \end{bmatrix}$ (d) ✔ $\begin{bmatrix} 4 & 2 \\ -3 & -1 \end{bmatrix}$

20. If A is non-singular matrix then $A^{-1} =$

(a) ✔$\frac{1}{|A|} adjA$ (b) $-\frac{1}{|A|} adjA$ (c) $\frac{|A|}{adjA}$ (d) $\frac{1}{|A| adjA}$

21. If $AX = B$ then X is equal to:

(a) AB (b) ✔ $A^{-1}B$ (c) $B^{-1}A$ (d) BA

22. Inverse of a matrix exists if it is:

(a) Singular (b) Null (c) Rectangular (d) ✔ Non-singular

23. Which of the property does not hold matrix multiplication?

(a) Associative (b) ✔ Commutative (c) Closure (d) Inverse

24. For any matrix A , it is always true that

(a) $A = A^t$ (b) – $A = \bar{A}$ (c) ✔$|A| = |A^t|$ (d) $A^{-1} = \frac{1}{A}$

25. If all entries of a square matrix of order 3 is multiplied by k, then value of $|kA|$ is equal to:

(a) $k|A|$ (b) $k^2|A|$ (c) ✔$k^3|A|$ (d) $|A|$

26. For a non-singular matrix it is true that :

(a) $(A^{-1})^{-1} = A$ (b) $(A^t)^t = A$ (c) $\bar{\bar{A}} = A$ (d) ✔all of these

27. For any non-singular matrices A and B it is true that:

(a) $(AB)^{-1} = B^{-1}A^{-1}$ (b) $(AB)^t = B^tA^t$ (c) $AB \neq BA$ (d) ✔ all of these

28. A square matrix $A = [a_{ij}]$ for which $a_{ij} = 0, i > j$ then A is called:

(a) ✔Upper triangular (b) Lower triangular (c) Symmetric (d) Hermitian

29. A square matrix $A = [a_{ij}]$ for which $a_{ij} = 0, i < j$ then A is called:

(a) Upper triangular (b) ✔Lower triangular (c) Symmetric (d) Hermitian

30. Any matrix A is called singular if:

(a) ✔$|A| = 0$ (b) $|A| \neq 0$ (c) $A^t = A$ (d) $AA^{-1} = I$

31. Which of the following Sets is a field.

(a) R (b) Q (c) C (d) ✔all of these

32. Which of the following Sets is not a field.

(a) R (b) Q (c) C (d) ✔Z

33. A square matrix A is symmetric if:

(a) ✔$A^t = A$ (b) $A^t = -A$ (c) $(\overline{A})^t = A$ (d) $(\overline{A})^t = -A$

34. A square matrix A is skew symmetric if:

(a) $A^t = A$ (b) ✔ $A^t = -A$ (c) $(\overline{A})^t = A$ (d) $(\overline{A})^t = -A$

35. A square matrix A is Hermitian if:

(a) $A^t = A$ (b) $A^t = -A$ (c) ✔$(\overline{A})^t = A$ (d) $(\overline{A})^t = -A$

36. A square matrix A is skew- Hermitian if:

(a) $A^t = A$ (b) $A^t = -A$ (c) $(\overline{A})^t = A$ (d) ✔$(\overline{A})^t = -A$

37. The main diagonal elements of a skew symmetric matrix must be:

(a) 1 (b) ✔ 0 (c) any non-zero number (d) any complex number

38. The main diagonal elements of a skew hermitian matrix must be:

(a) 1 (b) ✔ 0 (c) any non-zero number (d) any complex number

39. In echelon form of matrix, the first non zero entry is called:

(a) ✔Leading entry (b) first entry (c) preceding entry (d) Diagonal entry

40. The additive inverse of a matrix exist only if it is:

(a) Singular (b) non singular (c) null matrix (d) ✔ any matrix of order $m \times n$

41. The multiplicative inverse of a matrix exist only if it is:

(a) Singular (b) ✔ non singular (c) null matrix (d) any matrix of order $m \times n$

42. The number of non zero rows in echelon form of a matrix is called:

(a) Order of matrix (b) Rank of matrix (c) leading (d) leading row

43. If A is any square matrix then $A + A^t$ is a

(a) ✔Symmetric (b) skew symmetric (c) hermitian (d) skew hermitian

44. If A is any square matrix then $A - A^t$ is a

(a) Symmetric (b) ✔skew symmetric (c) hermitian (d) skew hermitian

45. If A is any square matrix then $A + (\overline{A})^t$ is a

(a) Symmetric (b) skew symmetric (c) ✔ hermitian (d) skew hermitian

46. If A is any square matrix then $A + (\overline{A})^t$ is a

(a) Symmetric (b) skew symmetric (c) hermitian (d) ✔ skew hermitian

47. If A is symmetric (Skew symmetric), then A^2 must be

(a) Singular (b) non singular (c) ✔symmetric (d) non trivial solution

48. In a homogeneous system of linear equations , the solution (0,0,0) is:

(a) ✔Trivial solution (b) non trivial solution (c) exact solution (d) anti symmetric

49. If $AX = O$ then $X =$

(a) I (b) ✔ O (c) A^{-1} (d) Not possible

50. If the system of linear equations have no solution at all, then it is called a/an

(a) Consistent system (b)✔ Inconsistent system (c) Trivial System (d) Non Trivial System

51. The value of λ for which the system $x + 2y = 4; 2x + \lambda y = -3$ does not possess the unique solution

(a) ✔4 (b) -4 (c) ± 4 (d) any real number

52. If the system $x + 2y = 0; 2x + \lambda y = 0$ has non-trivial solution, then λ is:

(a) ✔4 (b) -4 (c) ± 4 (d) any real number

53. The inverse of unit matrix is:

(a) ✔Unit (b) Singular (c) Skew Symmetric (d) rectangular

54. Transpose of a row matrix is:

(a) Diagonal matrix (b) zero matrix (c) ✔ column matrix (d) scalar matrix

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UNIT # 04 Quadratic Equations

Each question has four possible answer. Tick the correct answer.

1. The equation $ax^2 + bx + c = 0$ will be quadratic if:

(a) $a = 0, b \neq 0$ (b) ✔ $a \neq 0$ (c) $a = b = 0$ (d) $b =$ any real number

2. Solution set of the equation $x^2 - 4x + 4 = 0$ is:

(a) $\{2, -2\}$ (b) ✔ $\{2\}$ (c) $\{-2\}$ (d) $\{4, -4\}$

3. The quadratic formula for solving the equation $ax^2 + bx + c = 0; a \neq 0$ is

(a) ✔$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ (b) $x = \frac{-b \pm \sqrt{a^2 - 4ac}}{2b}$ (c) $x = \frac{-a \pm \sqrt{b^2 - 4ac}}{2}$ (d) None of these

4. To convert $ax^{2n} + bx^n + c = 0 (a \neq 0)$ into quadratic form , the correct substitution is:

(a) ✔$y = x^n$ (b) $x = y^n$ (c) $y = x^{-n}$ (d) $y = \frac{1}{x}$

5. The equation in which variable occurs in exponent , called:

(a) Exponential function (b) Quadratic equation (c) Reciprocal equation (d) ✔Exponential equation

6. To convert $4^{1+x} + 4^{1-x} = 10$ into quadratic , the substitution is:

(a) $y = x^{1-x}$ (b) $y = 4^{1+x}$ (c) $y = 4^x$ (d) $y = 4^{-x}$

7. The equations involving redical expressions of the variable are called:

(a) Reciprocal equations(b) ✔ Redical equations (c) Quadratic functions (d) exponential equations

8. The cube roots of unity are :

(a) ✔$1, \frac{-1+\sqrt{3}i}{2}, \frac{-1+\sqrt{3}i}{2}$ (b) $1, \frac{1+\sqrt{3}i}{2}, \frac{1+\sqrt{3}i}{2}$ (c) $-1, \frac{-1+\sqrt{3}i}{2}, \frac{-1+\sqrt{3}i}{2}$ (d) $-1, \frac{1+\sqrt{3}i}{2}, \frac{1+\sqrt{3}i}{2}$

9. Sum of all cube roots of 64 is :

(a) ✔0 (b) 1 (c) 64 (d) -64

10. Product of cube roots of -1 is:

(a) 0 (b) -1 (c) ✔1 (d) None

11. $16\omega^8 + 16w^4 =$

(a) 0 (b) ✔ -16 (c) 16 (d) -1

12. The sum of all four fourth roots of unity is:

(a) Unity (b) ✔0 (c) -1 (d) None

13. The product of all four fourth roots of unity is:

(a) Unity (b) 0 (c) ✔-1 (d) None

14. The sum of all four fourth roots of 16 is:

(a) 16 (b) -16 (c) ✔ 0 (d) 1

15. The complex cube roots of unity are…….. each other.

(a) Additive inverse (b) Equal to (c) ✔Conjugate (d) None of these

16. The complex cube roots of unity are…….. each other.

(a) Multiplicative inverse (b) reciprocal (c) square (d) ✔None of these

17. The complex fourth roots of unity are ……. of each other.

(a) ✔Additive inverse (b) equal to (c) square of (d) None of these

18. If sum of all cube roots of unity is equal to $x^2 + 1$, then x is equal to:

(a) -1 (b) 0 (c) ✔$\pm i$ (d) 1

19. If product of all cube roots of unity is equal to $p^2 + 1$, then p is equal to:

(a) -1 (b) ✔ 0 (c) $\pm i$ (d) 1

20. The expression $x^2 + \frac{1}{x} - 3$ is polynomial of degree:

(a) 2 (b) 3 (c) 1 (d) ✔ not a polynomial

21. If $f(x)$ is divided by $x - a$, then dividend = (Divisor)(…….)+ Remainder.

(a) Divisor (b) Dividend (c) ✔ Quotient (d) $f(a)$

22. If $f(x)$ is divided by $x - a$ by remainder theorem then remainder is:

(a) ✔ $f(a)$ (b) $f(-a)$ (c) $f(a) + R$ (d) $x - a = R$

23. The polynomial $(x - a)$ is a factor of $f(x)$ if and only if

(a) ✔ $f(a) = 0$ (b) $f(a) = R$ (c) Quotient $= R$ (d) $x = -a$

24. $x - 2$ is a factor of $x^2 - kx + 4$, if k is:

(a) 2 (b) ✔ 4 (c) 8 (d) -4

25. If $x = -2$ is the root of $kx^4 - 13x^2 + 36 = 0$, then $k =$

(a) 2 (b) -2 (c) 1 (d) ✔ -1

26. $x + a$ is a factor of $x^n + a^n$ when n is

(a) Any integer (b) any positive integer (c) ✔ any odd integer (d) any real number

27. $x - a$ is a factor of $x^n - a^n$ when n is

(a) ✔ Any integer (b) any positive integer (c) any odd integer (d) any real number

28. Sum of roots of $ax^2 - bx - c = 0$ is $(a \neq 0)$

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

29. Sum of roots of $ax^2 - bx - c = 0$ is $(a \neq 0)$

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

30. If 2 and -5 are roots of a quadratic equation , then equation is:

(a) $x^2 - 3x - 10 = 0$ (b) $x^2 - 3x + 10 = 0$ (c) ✔ $x^2 + 3x - 10 = 0$ (d) $x^2 + 3x + 10 = 0$

31. If α and β are the roots of $3x^2 - 2x + 4 = 0$, then the value of $\alpha + \beta$ is:

(a) ✔$\frac{2}{3}$ (b) $-\frac{2}{3}$ (c) $\frac{4}{3}$ (d) $-\frac{4}{3}$

32. If roots of $ax^2 + bx + c = 0, (a \neq 0)$ are real , then

(a) Disc≥ 0 (b) Disc< 0 (c) Disc$\neq 0$ (d) Disc≤ 0

33. If roots of $ax^2 + bx + c = 0, (a \neq 0)$ are complex , then

(a) ✔Disc≥ 0 (b) ✔ Disc< 0 (c) Disc$\neq 0$ (d) Disc≤ 0

34. If roots of $ax^2 + bx + c = 0, (a \neq 0)$ are equal , then

(a) ✔Disc$= 0$ (b) Disc< 0 (c) Disc$\neq 0$ (d) None of these

35. Graph of quadratic equation is:

(a) Straight line (b) Circle (c) square (d) ✔Parabola

36. $\omega^{28} + \omega^{29} + 1 =$

(a) ✔0 (b) 1 (c) -1 (d) ω

37. Synthetic division is a process of:

(a) Addition (b) multiplication (c) subtraction (d) ✔ division

38. Degree of quadratic equation is:

(a) 0 (b)1 (c) ✔2 (d) 3

39. Basic techniques for solving quadratic equations are

(a) 1 (b) 2 (c) ✔3 (d) 4

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UNIT # 05 Partial Fractions

Each question has four possible answer. Tick the correct answer.

1. An open sentence formed by using sign of " $=$ " is called a/an

(a) ✔Equation (b) Formula (c) Rational fraction (d) Theorem

2. If an equation is true for all values of the variable, then it is called:

(a) a conditional equation (b) ✔ an identity (c) proper rational fraction (d) All of these

3. $(x+3)(x+4)=x^2+7x+12$ is a/an:

(a) Conditional equation (b) ✔an identity (c) proper rational fraction (d) a formula

4. The quotient of two polynomials $\frac{P(x)}{Q(x)}, Q(x)\neq 0$ is called :

(a) ✔Rational fraction (b) Irrational fraction (c) Partial fraction (d) Proper fraction

5. A fraction $\frac{P(x)}{Q(x)}, Q(x)\neq 0$ is called proper fraction if :

(a) ✔Degree of $P(x)<$ Degree of $Q(x)$ (b) Degree of $P(x)=$ Degree of $Q(x)$

(c) Degree of $P(x)>$ Degree of $Q(x)$ (d) Degree of $P(x)\geq$ Degree of $Q(x)$

6. A fraction $\frac{P(x)}{Q(x)}, Q(x)\neq 0$ is called proper fraction if :

(a) Degree of $P(x)<$ Degree of $Q(x)$ (b) Degree of $P(x)=$ Degree of $Q(x)$

(c) Degree of $P(x)>$ Degree of $Q(x)$ (d) ✔ Degree of $P(x)\geq$ Degree of $Q(x)$

7. A mixed form of fraction is :

(a) An integer+ improper fraction (b) a polynomial+improper fraction

(c) ✔a polynomial+proper fraction (d) a polynomial+rational fraction

8. When a rational fraction is separated into partial fractions, then result is always :

(a) A conditional equations (b) ✔an identity (c) a partial fraction (d) an improper fraction

9. The number of Partial fraction of $\frac{x^3}{x(x+1)(x^2-1)}$ are:

(a) 2 (b) 3 (c) ✔4 (d) None of these

10. The number of Partial fraction of $\frac{x^5}{x(x+1)(x^2-4)}$ are:

(a) 2 (b) 3 (c) 4 (d) ✔ 6

11. Partial fractions of $\frac{1}{x^2-1}$ are:

(a) $\frac{1}{2(x-1)}+\frac{1}{2(x+1)}$ (b) ✔ $\frac{1}{2(x-1)}-\frac{1}{2(x+1)}$ (c) $-\frac{1}{2(x-1)}+\frac{1}{2(x+1)}$ (d) $-\frac{1}{2(x-1)}-\frac{1}{2(x+1)}$

12. Conditional equation $2x+3=0$ holds when x is equal to:

(a) ✔$-\frac{3}{2}$ (b) $\frac{3}{2}$ (c) $\frac{1}{3}$ (d) 1

13. Which is a reducible factor:

(a) x^3-6x^2+8x (b) x^2+16x (c) x^2+5x-6 (d) ✔all of these

14. A quadratic factor which cannot written as a product of linear factors with real coefficients is called:

(a) ✔An irreducible factor (b) reducible factor (c) an irrational factor (d) an improper factor

15. $\frac{9x^2}{x^3-1}$ is an

(a) Improper fraction (b) ✔ Proper fraction (c) Polynomial (d) equation

UNIT # 06 Sequence and Series

Each question has four possible answer. Tick the correct answer.

1. An arrangement of numbers according to some definite rule is called:

(a) ✔Sequence (b) Combination (c) Series (d) Permutation

2. A sequence is also known as:

(a) Real sequence (b) ✔Progression (c) Arrangement (d) Complex sequence

3. A sequence is function whose domain is

(a) Z (b) N (c) Q (d) ✔ R

4. As sequence whose range is R $i.e.$, set of real numbers is called:

(a) ✔Real sequence (b) Imaginary sequence (c) Natural sequence (d) Complex sequence

5. If $a_n = \{n + (-1)^n\}$, then $a_{10} =$

(a) 10 (b) ✔ 11 (c) 12 (d) 13

6. The last term of an infinite sequence is called :

(a) nth term (b) a_n (c) last term (d) ✔ does not exist

7. The next term of the sequence $1, 2, 12, 40, \ldots$ is

(a) ✔112 (b) 120 (c) 124 (d) None of these

8. A sequence $\{a_n\}$ in which $a_n - a_{n-1}$ is the same number for all $n \in N, n > 1$ is called:

(a) ✔A.P (b) G.P (c) H.P (d) None of these

9. nth term of an A.P is $3n - 1$ then 10^{th} term is :

(a) 9 (b) ✔ 29 (c) 12 (d) cannot determined

10. nth term of the series $\left(\frac{1}{3}\right)^2 + \left(\frac{5}{2}\right)^2 + \left(\frac{7}{3}\right)^2 + \cdots$

(a) ✔ $\left(\frac{2n-1}{3}\right)^2$ (b) $\left(\frac{2n-1}{3}\right)^2$ (c) $\left(\frac{2n}{3}\right)^2$ (d) cannot determined

11. If a_{n-1}, a_n, a_{n+1} are in A.P, then a_n is

(a) ✔A.M (b) G.M (c) H.M (d) Mid point

12. Arithmetic mean between c and d is:

(a) ✔$\frac{c+d}{2}$ (b) $\frac{c+d}{2cd}$ (c) $\frac{2cd}{c+d}$ (d) $\frac{2}{c+d}$

13. The arithmetic mean between $\sqrt{2}$ and $3\sqrt{2}$ is:

(a) $4\sqrt{2}$ (b) ✔ $\frac{4}{\sqrt{2}}$ (c) $\sqrt{2}$ (d) none of these

14. The sum of terms of a sequence is called:

(a) Partial sum (b) ✔ Series (c) Finite sum (d) none of these

15. Forth partial sum of the sequence $\{n^2\}$ is called:

(a) 16 (b) ✔ 1+4+9+16 (c) 8 (d) 1+2+3+4

16. Sum of n −term of an Arithmetic series S_n is equal to:

(a) ✔$\frac{n}{2}[2a + (n-1)d]$ (b) $\frac{n}{2}[a + (n-1)d]$ (c) $\frac{n}{2}[2a + (n+1)d]$ (d) $\frac{n}{2}[2a + l]$

17. For any $G.P.$, the common ratio r is equal to:

(a) $\frac{a_n}{a_{n+1}}$ (b) $\frac{a_{n-1}}{a_n}$ (c) ✔ $\frac{a_n}{a_{n-1}}$ (d) $a_{n+1} - a_n, n \in N, n > 1$

18. No term of a $G.P.$, is:

(a) ✔0 (b) 1 (c) negative (d) imaginary number

19. The general term of a $G.P.$, is :

(a) ✔$a_n = ar^{n-1}$ (b) $a_n = ar^n$ (c) $a_n = ar^{n+1}$ (d) None of these

20. The sum of infinite geometric series is valid if

(a) $|r| > 1$ (b) $|r| = 1$ (c) $|r| \geq 1$ (d) ✔ $|r| < 1$

21. For the series $1 + 5 + 25 + 125 + \cdots + \infty$, the sum is

(a) -4 (b) 4 (c) $\frac{1-5^n}{-4}$ (d) ✔ not defined

22. An infinite geometric series is convergent if

(a) $|r| > 1$ (b) $|r| = 1$ (c) $|r| \geq 1$ (d) ✔ $|r| < 1$

23. An infinite geometric series is divergent if

(a) $|r| < 1$ (b) $|r| \neq 1$ (c) $r = 0$ (d✔) $|r| > 1$

24. If sum of series is defined then it is called:

(a) ✔Convergent series (b) Divergent series (c) finite series (d) Geometric series

25. If sum of series is not defined then it is called:

(a) Convergent series (b) ✔ Divergent series (c) finite series (d) Geometric series

26. The interval in which series $1 + 2x + 4x^2 + 8x^3 + \cdots$ is convergent if :

(a) $-2 < x < 2$ (b) ✔ $-\frac{1}{2} < x < \frac{1}{2}$ (c) $|2x| > 1$ (d) $|x| < 1$

27. If the reciprocal of the terms a sequence form an $A.P.$, then it is called:

(a) ✔$H.P$ (b) $G.P$ (c) $A.P$ (d) sequence

28. The nth term of $\frac{1}{2}, \frac{1}{5}, \frac{1}{8}, \ldots$ is

(a) ✔$\frac{1}{3n-1}$ (b) $3n-1$ (c) $2n+1$ (d) $\frac{1}{3n+1}$

29. Harmonic mean between 2 and 8 is:

(a) ✔5 (b) $\frac{16}{5}$ (c) ± 4 (d) $\frac{5}{16}$

30. If A, G and H are Arithmetic , Geometric and Harmonic means between two positive numbers then

(a) $G^2 = AH$ (b) ✔$A, G, H \; are \; in \; G.P$ (c) $A > G > H$ (d) all of these

31. If A, G and H are Arithmetic , Geometric and Harmonic means between two negative numbers then

(a) $G^2 = AH$ (b) $A, G, H \; are \; in \; G.P$ (c) $A < G < H$ (d) ✔all of these

32. If a and b are two positive number then

(a) $A < G < H$ (b) ✔ $A > G > H$ (c) $A = G = H$ (d) $A \geq G \geq H$

33. If a and b are two negative number then

(a) ✔$A < G < H$ (b) $A > G > H$ (c) $A = G = H$ (d) $A \geq G \geq H$

34. If $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ is A.M between a and b then n is equal to:

(a) ✔0 (b) -1 (c) 1 (d) $\frac{1}{2}$

35. If $\frac{a^n+b^n}{a^{n-1}+b^{n-1}}$ is G.M between a and b then n is equal to:

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

36. If $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ is H.M between a and b then n is equal to:

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

37. If $S_n = (n+1)^2$, then S_{2n} is equal to:

(a) $2n+1$ (b) ✔ $4n^2 + 4n + 1$ (c) $(2n-1)^2$ (d) cannot be determined

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UNIT # 07 Permutation, Combination and Probability

Each question has four possible answer. Tick the correct answer.

1. $20_{P_3} =$

(a) 6890 (b) 6810 (c) ✔6840 (d) 6880

2. If $n_{P_2} = 30$ then $n =$

(a) 4 (b) 5 (c) ✔6 (d) 10

3. The number of diagonals in 10-sided figure is

(a) 10 (b) 10_{C_2} (c) ✔$10_{C_2} - 10$ (d) 45

4. $n_{C_0} =$

(a) 0 (b) ✔ 1 (c) n (d) $n!$

5. How many arrangement of the word "MATHEMATICS" can be made

(a) 11! (b) $\binom{11}{3,2,1,1,1,1,1}$ (c) ✔ $\binom{11}{2,2,2,1,1,1,1,1}$ (d) None

6. If n is negative then $n!$ is

(a) 1 (b) 0 (c) unique (d) ✔Not defined

7. $n-1_{C_r}+n-1_{C_{r-1}}$ equals
   (a) ✔n_{C_r} (b) $n_{C_{r-1}}$ (c) $n-1_{C_r}$ (d) $n+1_{C_r}$
8. How many signals can be given by 5 flags of different colors , using 3 at a time
   (a) 120 (b) ✔60 (c) 24 (d) 15
9. n_{P_n}=
   (a) 1 (b) n (c) ✔ $n!$ (d) None
10. $\frac{8!}{7!}=$
   (a) ✔8 (b) 7 (c) 56 (d) $\frac{8}{7}$
11. If an event A can occur in p ways and B can occur q ways , then number of ways that both events occur is:
   (a) $p+q$ (b) ✔ $p.q$ (c) $(pq)!$ (d) $(p+q)!$
12. If $\binom{n}{12}=\binom{n}{8}$ then the value of n,
   (a) 15 (b) 16 (c) 18 (d) ✔20
13. Probability of non-occurrence of an event E is equal to :
   (a) ✔$1-P(E)$ (b) $P(E)+\frac{n(S)}{n(E)}$ (c) $\frac{n(S)}{n(E)}$ (d) $1+P(E)$
14. For independent events $P(A\cap B)=$
   (a) $P(A)+P(B)$ (b) $P(A)-P(B)$ (c) ✔ $P(A).P(B)$ (d) $\frac{P(A)}{P(B)}$
15. A card is drawn from a deck of 52 playing cards. The probability of card that it is an ace card is:
   (a) $\frac{2}{13}$ (b) $\frac{4}{13}$ (c) ✔ $\frac{1}{13}$ (d) $\frac{17}{13}$
16. Four persons wants to sit in a circular sofa, the total ways are:
   (a) 24 (b) ✔6 (c) 4 (d) None of these
17. Two teams A and B are playing a match, the probability that team A does not lose is:
   (a) $\frac{1}{3}$ (b) $\frac{2}{3}$ (c) 1 (d) 0
18. Let $S=\{1,2,3,\dots,10\}$ the probability that a number is divided by 4 is :
   (a) $\frac{2}{5}$ (b) ✔ $\frac{1}{5}$ (c) $\frac{1}{10}$ (d) $\frac{1}{2}$
19. A die is rolled , the probability of getting 3 or 5 is:
   (a) $\frac{2}{3}$ (b) ✔ $\frac{15}{36}$ (c) $\frac{15}{36}$ (d) $\frac{1}{36}$
20. A coin is tossed 5 times , then $n(S)$ is equal to:
   (a) ✔32 (b) 25 (c) 10 (d) 20
21. The number of ways for sitting 4 persons in a train on a straight sofa is:
   (a) ✔24 (b) 6 (c) 4 (d) None of these
22. Sample space for tossing a coin is:
   (a) $\{H\}$ (b) $\{T\}$ (c) $\{H,H\}$ (d) ✔ $\{H,T\}$
23. If $P(E)=\frac{7}{12}, n(S)=8400, n(E)=$
   (a) 108 (b) ✔4900 (c) 144 (d) 14400
24. In a permutation n_{P_r} or $P(n,r)$, it is always true that
   (a) ✔$n\geq r$ (b) $n<r$ (c) $n\leq r$ (d) $n<0, r<0$
25. If an event always occurs , then it is called:
   (a) Null Event (b) Possible Event (c) ✔Certain event (d) Independent Event
26. If E is a certain event , then
   (a) $P(E)=0$ (b) ✔$P(E)=1$ (c) $0<P(E)<1$ (d) $P(E)>1$
27. If E is an impossible event ,then
   (a) ✔$P(E)=0$ (b) $P(E)=1$ (c) $P(E)\neq 0$ (d) $0<P(E)<1$
28. Non occurrence of an event E is denoted by:
   (a) $\sim E$ (b) ✔ $\overline{E}$ (c) E^c (d) All of these

UNIT # 08 Mathematical Induction and Binomial Theorem

Each question has four possible answer. Tick the correct answer.

1. **The statement $4^n + 3^n + 4$ is true when :**

(a) $n = 0$ (b) $n = 1$ (c) ✔ $n \geq 2$ (d) n is any +iv integer

2. **The number of terms in the expansion of $(a + b)^n$ are:**

(a) n (b) ✔ $n + 1$ (c) 2^n (d) 2^{n-1}

3. **Middle term/s in the expansion of $(a - 3x)^{14}$ is/are :**

(a) T_7 (b) ✔ T_8 (c) $T_6 \& T_7$ (d) $T_7 \& T_8$

4. **The coefficient of the last term in the expansion of $(2 - x)^7$ is :**

(a) 1 (b) ✔ -1 (c) 7 (d) -7

5. **$\binom{2n}{0} + \binom{2n}{1} + \binom{2n}{2} + \cdots + \binom{2n}{2n}$ is equal to:**

(a) 2^n (b) ✔2^{2n} (c) 2^{2n-1} (d) 2^{2n+1}

6. **$1 + x + x^2 + x^3 + \cdots$**

(a) $(1 + x)^{-1}$ (b) ✔$(1 - x)^{-1}$ (c) $(1 + x)^{-2}$ (d) $(1 - x)^{-2}$

7. **The middle term in the expansion of $(a + b)^n$ is $\left(\frac{n}{2} + 1\right)$; then n is**

(a) Odd (b) ✔ even (c) prime (d) none of these

8. **The number of terms in the expansion of $(a + b)^{20}$ is:**

(a) 18 (b) 20 (c) ✔ 21 (d) 19

9. **The expansion $(1 - 4x)^{-2}$ is valid if:**

(a) ✔$|x| < \frac{1}{4}$ (b) $|x| > \frac{1}{4}$ (c) $-1 < x < 1$ (d) $|x| < -1$

10. **The statement $3^n < n!$ is true, when**

(a) $n = 2$ (b) $n = 4$ (c) $n = 6$ (d) ✔$n > 6$

11. **General term in the expansion of $(a + b)^n$ is:**

(a) $\binom{n+1}{r} a^{n-r} x\text{^}r$ (b)✔$\binom{n}{r-1} a^{n-r} x^r$ (c) $\binom{n}{r+1} a^{n-r} x^r$ (d) $\binom{n}{r} a^{n-r} x^r$

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UNIT # 09 Fundamentals of Trigonometry

Each question has four possible answer. Tick the correct answer.

1. **Two rays with a common starting point form:**

(a) Triangle (b) ✔ Angle (c) Radian (d) Minute

2. **The common starting point of two rays is called:**

(a) Origin (b) Initial Point (c) ✔ Vertex (d)All of these

3. **If the rotation of the angle is counter clock wise, then angle is:**

(a) Negative (b) ✔ Positive (c) Non-Negative (d) None of these

4. **If the initial ray $\overrightarrow{OA}$ rates in anti-clockwise direction in such a way that it coincides with itself, the angle then formed is:**

(a) $180°$ (b) $270°$ (c) $300°$ (d) ✔ $360°$

5. **One rotation in anti-clock wise direction is equal to:**

(a) $180°$ (b) $270°$ (c) ✔$360°$ (d) $90°$

6. **Straight line angle is equal to**

(a) $\frac{1}{2} rotation$ (b) π radian (c) $180°$ (d) ✔ All of these

7. **One right angle is equal to**

(a) $\frac{\pi}{2} radian$ (b) $90°$ (c) $\frac{1}{4} rotation$ (d) ✔ All of these

8. **$1°$ is equal to**

(a) 30 minutes (b) ✔ 60 minutes (c) $\frac{1}{60}$ minutes (d) $\frac{1}{2}$ minutes

9. $1°$ is equal to

(a) $360''$ (b) ✔ $3600''$ (c) $(\frac{1}{360})'$ (d) $60''$

10. 60^{th} part of $1°$ is equal to

(a) One second (b) ✔ One minute (c) 1 Radian (d) π radian

11. 60^{th} part of $1'$ is equal to

(a) 1' (b) ✔ 1'' (c) 60'' (d) 3600''

12. 3600^{th} part of $1°$ is equal to

(a) 1' (b) ✔ 1'' (c) 60'' (d) 3600''

13. Sexagesimal system is also called

(a) German System (b) ✔ English System (c) C.G.S System (d) SI System

14. $16°30'$ equal to

(a) ✔16.5° (b) $\frac{32°}{2}$ (c) 16.05° (d) 16.2°

15. Conversion of $21.256°$ to $D°M'S''$ form is:

(a) 21°25'6'' (b) 21°40'27'' (c) ✔ 21°15'22'' (d) 21°30'2''

16. The angle subtended at the center of a circle by an arc whose length is equal to the radius of the circle is called:

(a) 1 Degree (b) 1' (c) ✔ 1 Radian (d) 1''

17. The system of angular measurement in which the angle is measured in radian is called:

(a) Sexagesimal System (b) ✔ Circular System (c) English System (d) Gradient System

18. Relation between the length of arc of a circle and the circular measure of it central angle is:

(a) $l = \frac{r}{\theta}$ (b) $\theta = lr$ (c) ✔ $\theta = \frac{l}{r}$ (d) $l = \frac{1}{2}r^2\theta$

19. With usual notation , if $l = 6cm, r = 2cm$, then unit of θ is:

(a) cm (b) cm^2 (c) ✔ No unit (d) cm^3

20. $1°$ is equal to:

(a) $\left(\frac{\pi}{180}\right)°$ (b) $\frac{180}{\pi}\ rad$ (c) $\left(\frac{180}{\pi}\right)rad$ (d) ✔ $\frac{\pi}{180}rad$

21. $1°$ is equal to:

(a) 0.175 rad (b) ✔0.0175rad (c) 1.75 rad (d) $0.00175rad$

22. 1 radian is equal to

(a) $\left(\frac{\pi}{180}\right)°$ (b) $\frac{180}{\pi}\ rad$ (c) ✔ $\left(\frac{180}{\pi}\right)^{\circ}$ (d) $\frac{\pi}{180}rad$

23. 1 radian is equal to:

(a) ✔57.296° (b) 5.7296° (c) 175.27° (d) 17.5276

24. 3 radian is:

(a) ✔171.888° (b) 120° (c) 300° (d) 270°

25. $105° =$ _____$radian$

(a) ✔$\frac{7\pi}{12}$ (b) $\frac{2\pi}{3}$ (c) $\frac{5\pi}{12}$ (d) $\frac{5\pi}{6}$

26. $3'' =$ _____ $radian$

(a) $\frac{53\pi}{270}$ (b) ✔ $\frac{\pi}{216000}$ (c) $\frac{41\pi}{720}$ (d) $\frac{27721\pi}{32400}$

27. $\frac{\pi}{4}radian =$ _____$degree$

(a) ✔45° (b) 30° (c) 60° (d) 75°

28. Circular measure of angle between the hands of a watch at $4'O\ clock$ is

(a) 45° (b) ✔ 120° (c) $\frac{3\pi}{2}$ (d) 270°

29. If $l = 1.5\ cm$ & $r = 2.5\ cm$ then θ is equal to:

(a) ✔$\frac{3}{5}$ (b) $\frac{5}{3}$ (c) 3.75 (d) $None$

30. If $\theta = 45°$, $r = 18mm$, then $l =$

(a) ✔$\frac{9}{2}\pi$ (b) $\frac{2}{9}\pi$ (c) 812mm (d) 810mm

31. Area of sector of circle of radius r is:

(a) ✔$\frac{1}{2}r^2\theta$ (b) $\frac{1}{2}r\theta^2$ (c) $\frac{1}{2}(r\theta)^2$ (d) $\frac{1}{2r^2\theta}$

32. Angles with same initial and terminal sides are called:

(a) Acute angles (b) Allied Angles (c) ✔Coterminal angles (d) Quadrentel angles

33. If angle θ is in degree, then the angle coterminal with θ is:

(a) $\theta + 180°k, k \in Z$ (b) ✔ $\theta + 360°k, k \in Z$ (c) $\theta + 90°k, k \in Z$ (d) $\theta + 60°k, k \in Z$

34. If angle θ is in degree, then the angle coterminal with θ is:

(a) ✔$\theta + 2\pi k, k \in Z$ (b) $\theta + \pi k, k \in Z$ (c) $\theta + \frac{\pi}{2}k, k \in Z$ (d) $\theta + \frac{\pi}{3}k, k \in Z$

35. An angle is in standard position , if its vertex is

(a) ✔At origin (b) at $x - axis$ (c) $aty - axis$ (d) in 1st Quad Only

36. If initial and the terminal side of an angle falls on $x - axis\ or\ y - axis$ then it is called:

(a) Coterminal angle (b) ✔ Quadrantal angl (c) Allied angle (d) None of these

37. $0°, 90°, 180°, 270°$ and $360°$ are called

(a) Coterminal angle (b) ✔ Quadrantal angl (c) Allied angle (d) None of these

38. $sin^2\theta + cos^2\theta$ is equal to:

(a) 0 (b) -1 (c) 2 (d) ✔ 1

39. $1 + tan^2\theta$ is equal to:

(a) $\csc^2\theta$ (b) $\sin^2\theta$ (c) ✔$\sec^2\theta$ (d) $\tan^2\theta$

40. $\csc^2\theta - \cot^2\theta$ is equal to:

(a) 0 (b) ✔ 1 (c) -1 (d) 2

41. If $sin\theta < 0$ and $cos\theta > 0$ then the terminal arm of angle lies in ……. Quad.

(a) I (b) II (c) III (d) ✔ IV

42. If $cot\theta > 0$ and $cosec\theta > 0$ then the terminal arm of angle lies in ……. Quad.

(a) ✔I (b) II (c) III (d) IV

43. If $tan\theta < 0$ and $cosec\theta > 0$ then the terminal arm of angle lies in ……. Quad.

(a) I (b) ✔ II (c) III (d) IV

44. If $sec\theta < 0$ and $sin\theta < 0$ then the terminal arm of angle lies in ……. Quad.

(a) I (b) II (c) ✔ III (d) IV

45. In right angle triangle, the measure of the side opposite to $30°$ is:

(a) ✔Half of Hypotenuse (b) Half of Base (c) Double of base (d) None of these

46. The point $(0, 1)$ lies on the terminal side of angle:

(a) $0°$ (b) ✔ $90°$ (c) $180°$ (d) $270°$

47. The point $(-1, 0)$ lies on the terminal side of angle:

(a) $0°$ (b) $90°$ (c) ✔ $180°$ (d) $270°$

48. The point $(0, -1)$ lies on the terminal side of angle:

(a) $0°$ (b) $90°$ (c) $180°$ (d) ✔ $270°$

49. $2Sin45° + \frac{1}{2}Cosec45° =$

(a) $\sqrt{\frac{2}{3}}$ (b) ✔$\frac{3}{\sqrt{2}}$ (c) -1 (d) 1

50. Domain of $sin\theta$ is:

(a) ✔R (b) $\theta \in R\ but\ \theta \neq n\pi, n \in Z$ (c) $\theta \in R\ but\ \theta \neq \frac{(2n+1)\pi}{2}, n \in Z$ (d) None of these

51. Domain of $cos\theta$ is:

(a) ✔R (b) $\theta \in R\ but\ \theta \neq n\pi, n \in Z$ (c) $\theta \in R\ but\ \theta \neq \frac{(2n+1)\pi}{2}, n \in Z$ (d) None of these

52. Domain of $tan\theta$ is:

(a) R (b) $\theta \in R\ but\ \theta \neq n\pi, n \in Z$ (c) ✔ $\theta \in R\ but\ \theta \neq \frac{(2n+1)\pi}{2}, n \in Z$ (d) None of these

53. Domain of $sec\theta$ is:

(a) R (b) $\theta \in R\ but\ \theta \neq n\pi, n \in Z$ (c) ✔ $\theta \in R\ but\ \theta \neq \frac{(2n+1)\pi}{2}, n \in Z$ (d) None of these

54. $cosec\theta sec\theta sin\theta cos\theta =$

(a) ✔1 (b) 0 (c) $sin\theta$ (d) $cos\theta$

55. $(sec\theta + tan\theta)(sec\theta - tan\theta) =$

(a) ✔1 (b) 0 $sec\theta$ (d) $tan\theta$

56. $\frac{1-sin\theta}{cos\theta} =$

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

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UNIT # 10 Trigonometric Identities

Each question has four possible answer. Tick the correct answer.

1. **Distance between the points $A(3,8)$ & $B(5,6)$ is:**

(a) ✔$2\sqrt{2}$ (b) 3 (c) 4 (d) $\sqrt{2}$

2. **Fundamental law of trigonometry is , $cos(\alpha-\beta)$**

(a) ✔$cos\alpha cos\beta+sin\alpha sin\beta$ (b) $cos\alpha cos\beta-sin\alpha sin\beta$
(c) $sin\alpha cos\beta+cos\alpha sin\beta$ (d) $sin\alpha cos\beta-cos\alpha sin\beta$

3. **$cos(\alpha+\beta)$ is equal to:**

(a) $cos\alpha cos\beta+sin\alpha sin\beta$ (b) ✔ $cos\alpha cos\beta-sin\alpha sin\beta$
(c) $sin\alpha cos\beta+cos\alpha sin\beta$ (d) $sin\alpha cos\beta-cos\alpha sin\beta$

4. **$sin(\alpha+\beta)$ is equal to:**

(a) $cos\alpha cos\beta+sin\alpha sin\beta$ (b) $cos\alpha cos\beta-sin\alpha sin\beta$
(c) ✔ $sin\alpha cos\beta+cos\alpha sin\beta$ (d) $sin\alpha cos\beta-cos\alpha sin\beta$

5. **$sin(\alpha-\beta)$ is equal to:**

(a) $cos\alpha cos\beta+sin\alpha sin\beta$ (b) $cos\alpha cos\beta-sin\alpha sin\beta$
(c) $sin\alpha cos\beta+cos\alpha sin\beta$ (d) ✔ $sin\alpha cos\beta-cos\alpha sin\beta$

6. $cos\left(\frac{\pi}{2}-\beta\right)=$

(a) $cos\beta$ (b) $-cos\beta$ (c) ✔ $sin\beta$ (d) $-sin\beta$

7. $cos\left(\beta+\frac{\pi}{2}\right)=$

(a) $cos\beta$ (b) $-cos\beta$ (c) $sin\beta$ (d) ✔ $-sin\beta$

8. $sin\left(\frac{\pi}{2}-\beta\right)=$

(a) ✔$cos\beta$ (b) $-cos\beta$ (c) $sin\beta$ (d) $-sin\beta$

9. $cos(2\pi-\theta)=$

(a) ✔$cos\theta$ (b) $-cos\theta$ (c) $sin\theta$ (d) $-sin\theta$

10. $sin(2\pi-\theta)=$

(a) $cos\theta$ (b) $-cos\theta$ (c) $sin\theta$ (d) ✔ $-sin\theta$

11. $tan(\alpha+\beta)=$

(a) $\frac{tan\alpha-tan\beta}{1+tan\alpha tan\beta}$ (b) ✔$\frac{tan\alpha+tan\beta}{1-tan\alpha tan\beta}$ (c) $\frac{tan\alpha-tan\beta}{1-tan\alpha tan\beta}$ (d) $\frac{tan\alpha+tan\beta}{1-tan\alpha tan\beta}$

12. $tan(\alpha-\beta)=$

(a) ✔$\frac{tan\alpha-tan\beta}{1+tan\alpha tan\beta}$ (b) $\frac{tan\alpha+tan\beta}{1-tan\alpha tan\beta}$ (c) $\frac{tan\alpha-tan\beta}{1-tan\alpha tan\beta}$ (d) $\frac{tan\alpha+tan\beta}{1-tan\alpha tan\beta}$

13. **Angles associated with basic angles of measure θ to a right angle or its multiple are called:**

(a) Coterminal angle (b) angle in standard position (c) ✔ Allied angle (d) obtuse angle

14. $tan\left(\frac{\pi}{2}-\theta\right)=$

(a) ✔$cot\theta$ (b) $tan\theta$ (c) $-cot\theta$ (d) $-tan\theta$

15. $tan\left(\frac{\pi}{2}+\theta\right)=$

(a) $cot\theta$ (b) $tan\theta$ (c) ✔$-cot\theta$ (d) $-tan\theta$

16. $sin\left(\frac{3\pi}{2}+\theta\right)=$

(a) $sin\theta$ (b) $cos\theta$ (c) $-sin\theta$ (d) ✔ $-cos\theta$

17. **$cos\ 315°$ is equal to:**

(a) 1 (b) 0 (c) ✔ $\frac{1}{\sqrt{2}}$ (d) $\frac{\sqrt{3}}{2}$

18. **$tan(-135°)$ is equal to:**

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

19. $sec(-300°)=$

(a) 1 (b) 0 (c) ✔ 2 (d) -1

20. $sin(180°+\alpha)sin(90°-\alpha)=$

(a) ✔ $sin\alpha cos\alpha$ (b) $-sin\alpha cos\alpha$ (c) $cos\gamma$ (d) $-cos\gamma$

21. **If α,β and γ are the angles of a triangle ABC then $sin(\alpha+\beta)=$**

(a) ✔ $sin\gamma$ (b) $-sin\gamma$ (c) $cos\gamma$ (d) $-cos\gamma$

22. If α, β and γ are the angles of a triangle ABC then $cos\left(\frac{\alpha+\beta}{2}\right) =$

(a) ✔ $\sin\frac{\gamma}{2}$ (b) $-\sin\frac{\gamma}{2}$ (c) $\cos\frac{\gamma}{2}$ (d) $-\cos\frac{\gamma}{2}$

23. If α, β and γ are the angles of a triangle ABC then $cos(\alpha+\beta) =$

(a) $sin\gamma$ (b) $-sin\gamma$ (c) $cos\gamma$ (d) ✔ $-cos\gamma$

24. $\frac{cos11°+sin11°}{cos11°-sin11°} =$

(a) ✔ $tan56°$ (b) $tan34°$ (c) $cot56°$ (d) $cot34°$

25. $sin2\alpha$ **is equal to:**

(a) $\cos^2\alpha - \sin^2\alpha$ (b) $1 + cos2\alpha$ (c) ✔ $2sin\alpha cos\alpha$ (d) $2sin2\alpha cos2\alpha$

26. $cos2\alpha =$

(a) $\cos^2\alpha - \sin^2\alpha$ (b) $1 - 2\sin^2\alpha$ (c) $2\cos^2\alpha - 1$ (d) ✔ All of these

27. $tan2\alpha =$

(a) $\frac{2tan\alpha}{1+tan2\,\alpha}$ (b) ✔ $\frac{2tan\alpha}{1-\tan^2\alpha}$ (c) $\frac{2\tan^2\alpha}{1-\tan^2\alpha}$ (d) $\frac{\tan^2\alpha}{1-\tan^2\alpha}$

28. $sin\alpha + sin\beta$ **is equal to:**

(a) ✔ $2\sin\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$ (b) $2\cos\left(\frac{\alpha+\beta}{2}\right)\sin\left(\frac{\alpha-\beta}{2}\right)$

(c) $-2\sin\left(\frac{\alpha+\beta}{2}\right)\sin\left(\frac{\alpha-\beta}{2}\right)$ (d) $2\cos\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$

29. $sin\alpha - sin\beta$ **is equal to:**

(b) $2\sin\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$ (b) ✔ $2\cos\left(\frac{\alpha+\beta}{2}\right)\sin\left(\frac{\alpha-\beta}{2}\right)$

(c) $-2\sin\left(\frac{\alpha+\beta}{2}\right)\sin\left(\frac{\alpha-\beta}{2}\right)$ (d) $2\cos\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$

30. $cos\alpha + cos\beta$ **is equal to:**

(c) $2\sin\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$ (b) $2\cos\left(\frac{\alpha+\beta}{2}\right)\sin\left(\frac{\alpha-\beta}{2}\right)$

(c) $-2\sin\left(\frac{\alpha+\beta}{2}\right)\sin\left(\frac{\alpha-\beta}{2}\right)$ (d) ✔ $2\cos\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$

31. $cos\alpha - cos\beta$ **is equal to:**

(d) $2\sin\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$ (b) $2\cos\left(\frac{\alpha+\beta}{2}\right)\sin\left(\frac{\alpha-\beta}{2}\right)$

(c) ✔ $-2\sin\left(\frac{\alpha+\beta}{2}\right)\sin\left(\frac{\alpha-\beta}{2}\right)$ (d) $2\cos\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$

32. Which is the allied angle

(a) ✔ $90° + \theta$ (b) $60° + \theta$ (c) $45° + \theta$ (d) $30° + \theta$

33. $2sin7\theta cos3\theta =$

(a) ✔ $sin10\theta + sin4\theta$ (b) $sin5\theta - sin2\theta$ (c) $cos10\theta + cos4\theta$ (d) $cos5\theta - cos2\theta$

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UNIT # 11 Trigonometric Functions and their Graphs

Each question has four possible answer. Tick the correct answer.

1. Domain of $y = sinx$ **is**

(a) ✔R (b) $-1 \le x \le 1$ (c) $-\infty < x < \infty, x \ne n\pi, n \in Z$ (d) $x \ge 1, x \le -1$

2. Domain of $y = cosx$ **is**

(a) ✔R (b) $-1 \le x \le 1$ (c) $-\infty < x < \infty, x \ne n\pi, n \in Z$ (d) $x \ge 1, x \le -1$

3. Domain of $y = tanx$ **is**

(a) $(-\infty, \infty)$ (b) $-1 \le x \le 1$ (c)✔$R - \left\{(2n+1)\frac{\pi}{2}\right\}, n \in Z$ (d) $x \ge 1, x \le -1$

4. Domain of $y = secx$ **is**

(a) $(-\infty, \infty)$ (b) $-1 \le x \le 1$ (c) ✔ $R - \left\{(2n+1)\frac{\pi}{2}\right\}, n \in Z$ (d) $x \ge 1, x \le -1$

5. Domain of $y = cscx$ **is**

(a) $(-\infty, \infty)$ (b)✔ $R - n\pi, n \in Z$ (c) $-\infty < x < \infty, x \ne \frac{2n+1}{2}\pi, n \in Z$ (d) $x \ge 1, x \le -1$

6. Domain of $y = cotx$ is

(a) $(-\infty, \infty)$ (b)✔ $R - n\pi, n \in Z$ (c) $-\infty < x < \infty, x \neq \frac{2n+1}{2}\pi, n \in Z$ (d) $x \geq 1, x \leq -1$

7. Range of $y = sinx$ is

(a) R (b) ✔$[-1,1]$ (c) $(-\infty, 1) \cup (1, \infty)$ (d) $-1 < y < 1$

8. Range of $y = cosx$ is

(a) R (b) ✔ $[-1,1]$ (c) $(-\infty, 1) \cup (1, \infty)$ (d) $-1 < y < 1$

9. Range of $y = tanx$ is

(a) ✔R (b) $-1 \leq y \leq 1$ (c) Q (d) $R - \{0\}$

10. Range of $y = cotx$ is

(a) ✔R (b) $R - [-1,1]$ (c) $R - \{0\}$ (d) Z

11. Range of $y = secx$ is

(a) R (b) ✔ $R - (-1,1)$ (c) $-1 \leq y \leq 1$ (d) $R - [-1,1]$

12. Range of $y = cosecx$ is

(a) R (b) ✔ $R - (-1,1)$ (c) $-1 \leq y \leq 1$ (d) $R - [-1,1]$

13. Smallest $+ive$ number which when added to the original circular measure of the angle gives the same value of the function is called:

(a) Domain (b) Range (c) Co domain (d) ✔Period

14. Period of $sin\theta$ is

(a) π (b) ✔ 2π (c) -2π (d) $\frac{\pi}{2}$

15. Period of $cosec\theta$ is

(a) π (b) ✔2π (c) -2π (d) $\frac{\pi}{2}$

16. Period of $cos\theta$ is

(a) π (b) ✔2π (c) -2π (d) $\frac{\pi}{2}$

17. Period of $tan\theta$ is

(a) ✔π (b) 2π (c) -2π (d) $\frac{\pi}{2}$

18. Period of $cot\theta$ is

(a) ✔π (b) 2π (c) -2π (d) $\frac{\pi}{2}$

19. Period of $sec\theta$ is

(a) π (b) ✔2π (c) -2π (d) $\frac{\pi}{2}$

20. Period of $tan4x$ is

(a) π (b) 2π (c) -2π (d) ✔ $\frac{\pi}{4}$

21. Period of $cot3x$ is

(a) π (b) ✔ $\frac{\pi}{3}$ (c) -2π (d) $\frac{\pi}{4}$

22. Period of $3cos\frac{x}{5}$ is

(a) 2π (b) $\frac{\pi}{2}$ (c) π (d) ✔ 10π

23. The graph of trigonometric functions have:

(a) Break segments (b) Sharp corners (c) Straight line segments (d) ✔ smooth curves

24. Curves of the trigonometric functions repeat after fixed intervals because trigonometric functions are

(a) Simple (b) linear (c) quadratic (d) ✔ periodic

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UNIT # 12 Application of Trigonometry

Each question has four possible answer. Tick the correct answer.

1. A "Triangle" has :

(a) Two elements (b) 3 elements (c) 4 elements (d) ✔ 6 elmen

2. When we look an object above the horizontal ray, the angle formed is called angle of:

(a) ✔Elevation (b) depression (c) incidence (d) reflects

3. When we look an object below the horizontal ray, the angle formed is called angle of:

(a) Elevation (b) ✔ depression (c) incidence (d) reflects

4. A triangle which is not right is called:

(a) ✔Oblique triangle (b) Isosceles triangle (c) Scalene triangle (d) Right isosceles triangle

5. To solve an oblique triangle we use:

(a) ✔Law of Sine (b) Law of Cosine (c) Law of Tangents (d) All of these

6. In any triangle ABC, $\frac{b^2+c^2-a^2}{2bc} =$

(a) ✔$cos\alpha$ (b) $sin\alpha$ (c) $cos\beta$ (d) $cos\gamma$

7. Which can be reduced to Pythagoras theorem,

(a) Law of sine (b) ✔ law of cosine (c) law of tangents (d) Half angle formulas

8. In any triangle ABC, if $\beta = 90°$, then $b^2 = a^2 + c^2 - 2accos\beta$ becomes:

(a) Law of sine (b) Law of tangents (c) ✔Law of cosine (d) None of these

9. In any triangle ABC, law of tangent is :

(a) $\frac{a-b}{a+b} = \frac{\tan(\alpha-\beta)}{\tan(\alpha+\beta)}$ (b) $\frac{a+b}{a-b} = \frac{\tan(\alpha+\beta)}{\tan(\alpha-\beta)}$ (c) ✔ $\frac{a-b}{a+b} = \frac{\tan\frac{\alpha-\beta}{2}}{\tan\frac{\alpha+\beta}{2}}$ (d) $\frac{a-b}{a+b} = \frac{\tan\frac{\alpha+\beta}{2}}{\tan\frac{\alpha-\beta}{2}}$

10. In any triangle ABC, $\sqrt{\frac{(s-a)(s-b)}{ab}} =$

(a) $\sin\frac{\alpha}{2}$ (b) $\sin\frac{\beta}{2}$ (c) ✔ $\sin\frac{\gamma}{2}$ (d) $\cos\frac{\alpha}{2}$

11. In any triangle ABC, $\sqrt{\frac{(s-b)(s-c)}{bc}} =$

(a) ✔ $\sin\frac{\alpha}{2}$ (b) $\sin\frac{\beta}{2}$ (c) $\sin\frac{\gamma}{2}$ (d) $\cos\frac{\alpha}{2}$

12. In any triangle ABC, $\sqrt{\frac{(s-a)(s-c)}{ac}} =$

(a) $\sin\frac{\alpha}{2}$ (b) ✔ $\sin\frac{\beta}{2}$ (c) $\sin\frac{\gamma}{2}$ (d) $\cos\frac{\alpha}{2}$

13. In any triangle ABC, $cos\frac{\alpha}{2} =$

(a) $\sqrt{\frac{s(s-a)}{ab}}$ (b) $\sqrt{\frac{s(s-b)}{ac}}$ (c) ✔ $\sqrt{\frac{s(s-a)}{bc}}$ (d) $\sqrt{\frac{s(s-c)}{ab}}$

14. In any triangle ABC, $cos\frac{\beta}{2} =$

(a) $\sqrt{\frac{s(s-a)}{ab}}$ (b) ✔ $\sqrt{\frac{s(s-b)}{ac}}$ (c) $\sqrt{\frac{s(s-a)}{bc}}$ (d) $\sqrt{\frac{s(s-c)}{ab}}$

15. In any triangle ABC, $cos\frac{\gamma}{2} =$

(a) $\sqrt{\frac{s(s-a)}{ab}}$ (b) $\sqrt{\frac{s(s-b)}{ac}}$ (c) $\sqrt{\frac{s(s-a)}{bc}}$ (d) ✔ $\sqrt{\frac{s(s-c)}{ab}}$

16. In any triangle ABC, with usual notations , s is equal to

(a) $a+b+c$ (b) $\frac{a+b+c}{3}$ (c) ✔ $\frac{a+b+c}{2}$ (d) $\frac{abc}{2}$

17. In any triangle ABC, $\sqrt{\frac{s(s-c)}{(s-a)(s-b)}} =$

(a) $\sin\frac{\gamma}{2}$ (b) $\cos\frac{\gamma}{2}$ (c) $\tan\frac{\gamma}{2}$ (d) ✔ $\cot\frac{\gamma}{2}$

18. In any triangle ABC, $\sqrt{\frac{(s-a)(s-b)}{s(s-c)}} =$

(a) $\sin\frac{\gamma}{2}$ (b) $\cos\frac{\gamma}{2}$ (c) ✔ $\tan\frac{\gamma}{2}$ (d) $\cot\frac{\gamma}{2}$

19. To solve an oblique triangles when measure of three sides are given , we can use:

(a) ✔Hero's formula (b) Law of cosine (c) Law of sine (d) Law of tangents

20. The smallest angle of ΔABC, when $a = 37.34$, $b = 3.24$, $c = 35.06$ is

(a) α (b) ✔β (c) γ (d) cannot be determined

21. In any triangle ABC Area if triangle is :

(a) $bc\sin\alpha$ (b) $\frac{1}{2}ca\ sin\alpha$ (c) $\frac{1}{2}ab\ sin\beta$ (d) ✔ $\frac{1}{2}absin\gamma$

22. The circle passing through the thee vertices of a triangle is called:

(a) ✔Circum circle (b) in-circle (c) ex-centre (d) escribed circle

23. The point of intersection of the right bisectors of the sides of the triangle is :

(a) ✔Circum centre (b) In-centre (c) Escribed center (d) Diameter

24. In any triangle ABC, with usual notations, $\frac{a}{2sin\alpha} =$

(a) r (b) r_1 (c) ✔ R (d) Δ

25. In any triangle ABC, with usual notations, $\frac{a}{sin\beta} =$

(a) $2r$ (b) $2\,r_1$ (c) ✔ $2R$ (d) 2Δ

26. In any triangle ABC, with usual notations, $sin\,\gamma =$

(a) R (b) ✔ $\frac{c}{2R}$ (c) $\frac{2R}{c}$ (d) $\frac{R}{2}$

27. In any triangle ABC, with usual notations, $abc =$

(a) R (b) Rs (c) ✔ $4R\Delta$ (d) $\frac{\Delta}{s}$

28. In any triangle ABC, with usual notations, $\frac{\Delta}{s-a} =$

(a) r (b) R (c) ✔ r_1 (d) r_2

29. In any triangle ABC, with usual notations, $\frac{\Delta}{s-b} =$

(a) r (b) R (c) r_1 (d) ✔ r_2

30. In any triangle ABC, with usual notations, $\frac{\Delta}{s-c} =$

(a) ✔r_3 (b) R (c) r_1 (d) r_2

31. In any triangle ABC, with usual notation , $r:R:r_1 =$

(a) 3:2:1 (b) 1:2:2 (c) ✔ 1:2:3 (d) 1:1:1

32. In any triangle ABC, with usual notation , $r:R:r_1:r_2:r_3 =$

(a) 3:3:3:2:1 (b) 1:2:2:3:3 (c) ✔ 1:2:3:3:3 (d) 1:1:1:1:1

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UNIT # 13 Inverse trigonometric functions

Each question has four possible answer. Tick the correct answer.

1. If $y = Sinx$, then Domain is :

(a) ✔R (b) $0 \le x \le \pi$ (c) $[0,\pi], x \ne \frac{\pi}{2}$ (d) $\left[-\frac{\pi}{2},\frac{\pi}{2}\right], x \ne 0$

2. If $y = Cosx$, then Domain is :

(a) $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$ (b) ✔ R (c) $[0,\pi], x \ne \frac{\pi}{2}$ (d) $\left[-\frac{\pi}{2},\frac{\pi}{2}\right], x \ne 0$

3. If $y = Secx$, then Domain is :

(a) $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$ (b) $0 \le x \le \pi$ (c)✔ $R - \left\{(2n+1)\frac{\pi}{2}\right\}, n \in Z$ (d) $\left[-\frac{\pi}{2},\frac{\pi}{2}\right], x \ne 0$

4. If $y = Cosecx$, then Domain is :

(a) $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$ (b) $0 \le x \le \pi$ (c) $[0,\pi], x \ne \frac{\pi}{2}$ (d)✔ $R - n\pi, n \in Z$

5. If $y = Tanx$, then Domain is :

(a) $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$ (b) ✔$R - \left\{(2n+1)\frac{\pi}{2}\right\}, n \in Z$ (c) $[0,\pi], x \ne \frac{\pi}{2}$ (d) $\left[-\frac{\pi}{2},\frac{\pi}{2}\right], x \ne 0$

6. If $y = Cotx$, then Domain is :

(a) $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$ (b) $0 \le x \le \pi$ (c) ✔ $R - n\pi, n \in Z$ (d) $\left[-\frac{\pi}{2},\frac{\pi}{2}\right], x \ne 0$

7. If $y = Sinx$, then range is :

(a) ✔$[-1,1]$ (b) $(-\infty,+\infty) or\ R$ (c) $y \le -1\ or\ y \ge 1$ (d) $y < -1 or\ y > 1$

8. If $y = Cosx$, then range is :

(a) ✔$[-1,1]$ (b) $(-\infty,+\infty) or\ R$ (c) $y \le -1\ or\ y \ge 1$ (d) $y < -1 or\ y > 1$

9. If $y = Tanx$, then range is :

(a) $-1 \le x \le 1$ (b) ✔ $(-\infty,+\infty) or\ R$ (c) $y \le -1\ or\ y \ge 1$ (d) $y < -1 or\ y > 1$

10. If $y = Cotx$, then range is :

(a) $-1 \le x \le 1$ (b) ✔ $(-\infty,+\infty) or\ R$ (c) $y \le -1\ or\ y \ge 1$ (d) $y < -1 or\ y > 1$

11. If $y = Cosecx$, then range is :

(a) $-1 \le x \le 1$ (b) $(-\infty,+\infty) or\ R$ (c) ✔$(-\infty,-1] \cup [1,\infty)$ (d) $y < -1 or\ y > 1$

12. If $y = Secx$, then range is :

(a) $-1 \le x \le 1$ (b) $(-\infty,+\infty) or\ R$ (c) ✔$(-\infty,-1] \cup [1,\infty)$ (d) $y < -1 or\ y > 1$

13. If $y = Sin^{-1}x$, then domain is:

(a) ✔$[-1,1]$ (b) $(-\infty,+\infty) or\ R$ (c) $x \ge -1\ or\ x \le 1$ (d) $x \le -1\ or\ x \ge 1$

14. If $y = Cos^{-1}x$, then domain is:

(a) ✔$[-1,1]$ (b) $(-\infty, +\infty) or\ R$ (c) $x \geq -1\ or\ x \leq 1$ (d) $x \leq -1\ or\ x \geq 1$

15. If $y = Tan^{-1}x$, then domain is:

(a) $-1 \leq x \leq 1$ (b) ✔ $(-\infty, +\infty) or\ R$ (c) $x \geq -1\ or\ x \leq 1$ (d) $x \leq -1\ or\ x \geq 1$

16. If $y = Cot^{-1}x$, then domain is:

(a) $-1 \leq x \leq 1$ (b) ✔ $(-\infty, +\infty) or\ R$ (c) $x \geq -1\ or\ x \leq 1$ (d) $x \leq -1\ or\ x \geq 1$

17. If $y = Sec^{-1}x$, then domain is:

(a) $-1 \leq x \leq 1$ (b) $(-\infty, +\infty) or\ R$ (c) ✔ $(-\infty, -1] \cup [1, \infty)$ (d) $x \leq -1\ or\ x \geq 1$

18. If $y = Cosec^{-1}x$, then domain is:

(a) $-1 \leq x \leq 1$ (b) $(-\infty, +\infty) or\ R$ (c) ✔ $(-\infty, -1] \cup [1, \infty)$ (d) $x \leq -1\ or\ x \geq 1$

19. If $y = Sin^{-1}x$, then range is:

(a) ✔ $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ (b) $0 \leq x \leq \pi$ (c) $-\frac{\pi}{2} < x < \frac{\pi}{2}$ (d) $0 < x < \pi$

20. If $y = Cos^{-1}x$, then range is:

(a) $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$ (b) ✔ $[0, \pi]$ (c) $-\frac{\pi}{2} < x < \frac{\pi}{2}$ (d) $0 < x < \pi$

21. If $y = Tan^{-1}x$, then range is:

(a) $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$ (b) $0 \leq x \leq \pi$ (c) ✔ $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ (d) $0 < x < \pi$

22. If $y = Cot^{-1}x$, then range is:

(a) $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$ (b) $0 \leq x \leq \pi$ (c) $-\frac{\pi}{2} < x < \frac{\pi}{2}$ (d) ✔ $(0, \pi)$

23. If $y = sec^{-1}x$, then range is:

(a) $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$ (b) ✔ $[0, \pi] - \{\frac{\pi}{2}\}$ (c) $-\frac{\pi}{2} < x < \frac{\pi}{2}$ (d) $0 < x < \pi$

24. If $y = Cosec^{-1}x$, then range is:

(a) $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$ (b) ✔ $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right] - \{0\}$ (c) $-\frac{\pi}{2} < x < \frac{\pi}{2}$ (d) $0 < x < \pi$

25. Inverse of a function exist only if it is:

(a) Trigonometric function (b) ✔$(1-1)$ function (c) onto function (d) an into function

26. $Sin^{-1}x =$

(a) ✔ $\frac{\pi}{2} - \cos^{-1} x$ (b) $\frac{\pi}{2} - \sin^{-1} x$ (c) $\frac{\pi}{2} + \cos^{-1} x$ (d) $\frac{\pi}{2} - cosec^{-1}x$

27. $Cos^{-1}x =$

(a) $\frac{\pi}{2} - \cos^{-1} x$ (b) ✔ $\frac{\pi}{2} - \sin^{-1} x$ (c) $\frac{\pi}{2} + \cos^{-1} x$ (d) $\frac{\pi}{2} - cosec^{-1}x$

28. $Cos^{-1}x =$

(a) ✔ $\frac{\pi}{2} - \sec^{-1} x$ (b) $\frac{\pi}{2} - \sin^{-1} x$ (c) $\frac{\pi}{2} + \sec^{-1} x$ (d) $\frac{\pi}{2} - cosec^{-1}x$

29. $Sec^{-1}x =$

(a) $\frac{\pi}{2} - \sec^{-1} x$ (b) $\frac{\pi}{2} - \sin^{-1} x$ (c) $\frac{\pi}{2} + \sec^{-1} x$ (d) ✔ $\frac{\pi}{2} - cosec^{-1}x$

30. $Tan^{-1}x =$

(a) $\frac{\pi}{2} - \sec^{-1} x$ (b) $\frac{\pi}{2} - \sin^{-1} x$ (c) ✔ $\frac{\pi}{2} - \cot^{-1} x$ (d) $\frac{\pi}{2} - cosec^{-1}x$

31. $Cot^{-1}x =$

(a) $\frac{\pi}{2} - \sec^{-1} x$ (b)✔ $\frac{\pi}{2} - \tan^{-1} x$ (c) $\frac{\pi}{2} + \sec^{-1} x$ (d) $\frac{\pi}{2} - cosec^{-1}x$

32. $Sin\left(Cos^{-1}\frac{\sqrt{3}}{2}\right) =$

(a) $\frac{\pi}{6}$ (b) ✔ $\frac{1}{2}$ (c) $-\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$

33. $Tan^{-1}(\sqrt{3}) =$

(a) $\frac{\pi}{6}$ (b) $-\frac{\pi}{6}$ (c) $-\frac{\pi}{3}$ (d) ✔ $\frac{\pi}{3}$

34. $Sin\left(Sin^{-1}\frac{1}{2}\right) =$

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

35. $Sin^{-1}A + Sin^{-1}B =$

(a) ✔$Sin^{-1}\left(A\sqrt{1-B^2} + B\sqrt{1-A^2}\right)$ (b) $Sin^{-1}\left(A\sqrt{1-A^2} - B\sqrt{1-B^2}\right)$

(c) $Sin^{-1}\left(B\sqrt{1-A^2} + A\sqrt{1-B^2}\right)$ (d) $Sin^{-1}\left(AB\sqrt{(1-A^2)(1-B^2)}\right)$

36. $Sin^{-1}A - Sin^{-1}B =$

(a) $Sin^{-1}\left(A\sqrt{1-B^2} + B\sqrt{1-A^2}\right)$ (b) ✔ $Sin^{-1}\left(A\sqrt{1-A^2} - B\sqrt{1-B^2}\right)$

(c) $Sin^{-1}\left(B\sqrt{1-A^2} + A\sqrt{1-B^2}\right)$ (d) $Sin^{-1}\left(AB\sqrt{(1-A^2)(1-B^2)}\right)$

37. $\boldsymbol{Cos^{-1}A - Cos^{-1}B =}$

(a) $Cos^{-1}\left(AB - \sqrt{(1-A^2)(1-B^2)}\right)$ (b) $Cos^{-1}\left(AB + \sqrt{(1-A^2)(1-B^2)}\right)$

(c) ✔$Cos^{-1}\left(AB - \sqrt{(1+A^2)(1+B^2)}\right)$ (d) $Cos^{-1}\left(AB + \sqrt{(1+A^2)(1+B^2)}\right)$

38. $\boldsymbol{Cos^{-1}A + Cos^{-1}B =}$

(a) $Cos^{-1}\left(AB - \sqrt{(1-A^2)(1-B^2)}\right)$ (b) ✔ $Cos^{-1}\left(AB + \sqrt{(1-A^2)(1-B^2)}\right)$

(c) $Cos^{-1}\left(AB - \sqrt{(1+A^2)(1+B^2)}\right)$ (d) $Cos^{-1}\left(AB + \sqrt{(1+A^2)(1+B^2)}\right)$

39. $\boldsymbol{Tan^{-1}A - Tan^{-1}B =}$

(a) ✔$Tan^{-1}\left(\frac{A-B}{1+AB}\right)$ (b) $Tan^{-1}\left(\frac{A+B}{1+AB}\right)$ (c) $Tan^{-1}\left(\frac{A-B}{1-AB}\right)$ (d) $Tan^{-1}\left(\frac{A+B}{1+AB}\right)$

40. $\boldsymbol{Tan^{-1}A + Tan^{-1}B =}$

(a) $Tan^{-1}\left(\frac{A-B}{1+AB}\right)$ (b) ✔ $Tan^{-1}\left(\frac{A+B}{1-AB}\right)$ (c) $Tan^{-1}\left(\frac{A-B}{1-AB}\right)$ (d) $Tan^{-1}\left(\frac{A+B}{1+AB}\right)$

41. $\boldsymbol{Sin^{-1}(-x) =}$

(a) ✔$-Sin^{-1}x$ (b) $Sin^{-1}x$ (c) $\pi - Sin^{-1}x$ (d) $\pi - Sinx$

42. $\boldsymbol{Cos^{-1}(-x) =}$

(a) $-Cos^{-1}x$ (b) $Cos^{-1}x$ (c) ✔ $\pi - Cos^{-1}x$ (d) $\pi - Cosx$

43. $\boldsymbol{Tan^{-1}(-x) =}$

(a) ✔$-Tan^{-1}x$ (b) $Tan^{-1}x$ (c) $\pi - Tan^{-1}x$ (d) $\pi - Tanx$

44. $\boldsymbol{Cosec^{-1}(-x) =}$

(a) ✔$-Cosec^{-1}x$ (b) $Cosec^{-1}x$ (c) $\pi - Cosec^{-1}x$ (d) $\pi - Cosecx$

45. $\boldsymbol{Sec^{-1}(-x) =}$

(a) $-Sec^{-1}x$ (b) $Sec^{-1}x$ (c) ✔ $\pi - Sec^{-1}x$ (d) $\pi - Secx$

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UNIT # 14 Solution of Trigonometric Equations

Each question has four possible answer. Tick the correct answer.

1. An equation containing at least one trigonometric function is called:

(a) Trigonometric function (b) ✔Trigonometric equation (c) Trigonometric value (d) None

2. If $\boldsymbol{sinx = \frac{1}{2}}$, then solution in the interval $\boldsymbol{[0, 2\pi]}$ is:

(a) ✔$\{\frac{\pi}{6}, \frac{5\pi}{6}\}$ (b) $\{\frac{\pi}{6}, \frac{7\pi}{6}\}$ (c) $\{\frac{\pi}{3}, \frac{4\pi}{6}\}$ (d) $\{\frac{\pi}{3}, \frac{2\pi}{6}\}$

3. If $\boldsymbol{cosx = \frac{1}{2}}$, then the reference angle is:

(a) ✔$\frac{\pi}{3}$ (b) $-\frac{\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $-\frac{\pi}{6}$

4. If $\boldsymbol{sinx = \frac{1}{2}}$, then the reference angle is:

(a) $\frac{\pi}{3}$ (b) $-\frac{\pi}{3}$ (c) ✔ $\frac{\pi}{6}$ (d) $-\frac{\pi}{6}$

5. General solution of $\boldsymbol{tanx = 1}$ is:

(a) ✔$\{\frac{\pi}{4} + n\pi, \frac{5\pi}{4} + n\pi\}$ (b)$\{\frac{\pi}{4} + 2n\pi, \frac{5\pi}{4} + 2n\pi\}$ (c)$\{\frac{\pi}{4} + n\pi, \frac{3\pi}{4} + n\pi\}$ (d)$\{\frac{\pi}{4} + 2n\pi, \frac{3\pi}{4} + 2n\pi\}$

6. If $\boldsymbol{tan2x = -1}$, then solution in the interval $\boldsymbol{[0, \pi]}$is:

(a) ✔$\frac{\pi}{8}$ (b) $\frac{\pi}{4}$ (c) $\frac{3\pi}{8}$ (d) $\frac{3\pi}{4}$

7. If $\boldsymbol{sinx + cosx = 0}$ then value of $\boldsymbol{x \in [0, 2\pi]}$

(a) $\{\frac{\pi}{4}, \frac{3\pi}{4}\}$ (b) $\{\frac{\pi}{4}, \frac{7\pi}{4}\}$ (c) ✔ $\{\frac{3\pi}{4}, \frac{7\pi}{4}\}$ (d) $\{\frac{\pi}{4}, \frac{-\pi}{4}\}$

8. General solution of $\boldsymbol{4sinx - 8 = 0}$ is:

(a) $\{\pi + 2n\pi\}$ (b) $\{\pi + n\pi\}$ (c) $\{-\pi + n\pi\}$ (d) ✔not possible

9. General solution of $\boldsymbol{1 + cosx = 0}$ is:

(a) ✔$\{\pi + 2n\pi\}$ (b) $\{\pi + n\pi\}$ (c) $\{-\pi + n\pi\}$ (d) not possible

10. For the general solution , we first find the solution in the interval whose length is equal to its:

(a) Range (b) domain (c) co-domain (d) ✔ period

11. All trigonometric functions are ……. functions.

(a) ✔Periodic (b) continues (c) injective (d) bijective

12. General solution of every trigonometric equation consists of :

(a) One solution only (b) two solutions (c) ✔ infinitely many solutions (d) no real solution

13. Solution of the equation $2sinx + \sqrt{3} = 0$ in the 4th quadrant is:

(a) $\frac{\pi}{2}$ (b) ✔ $\frac{-\pi}{3}$ (c) $\frac{-\pi}{6}$ (d) $\frac{11\pi}{6}$

14. If $sinx = cosx$, then general solution is:

(a) $\{\frac{\pi}{4} + n\pi, n \in Z\}$ (b) $\{\frac{\pi}{4} + 2n\pi, n \in Z\}$

(c) ✔ $\{\frac{\pi}{4} + n\pi, \frac{5\pi}{4} + n\pi\}$ (d)$\{\frac{\pi}{4} + n\pi, \frac{5\pi}{4} + n\pi\}$

15. In which quadrant is the solution of the equation $sinx + 1 = 0$

(a) 1st and 2nd (b) 2nd and 3rd (c) ✔ 3rd and 4th (d) Only 1st

16. If $sinx = 0$ then $x =$

(a) ✔$n\pi, n \in Z$ (b) $\frac{n\pi}{2}, n \in Z$ (c) 0 (d) $\frac{\pi}{2}$

17. If $tanx = 0$ then $x =$

(a) ✔$n\pi, n \in Z$ (b) $\frac{n\pi}{2}, n \in Z$ (c) 0 (d) $\frac{\pi}{2}$

18. The solution of the $cotx = \frac{1}{\sqrt{3}}$ in $[0, \pi]$ is

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{4}$ (c) $\frac{2\pi}{3}$ (d) ✔ $\frac{\pi}{3}$

19. One solution of $secx = -2$ is :

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{4}$ (c) ✔ $\frac{2\pi}{3}$ (d) $\frac{\pi}{3}$

20. $Sin2x = \frac{\sqrt{3}}{2}$ has two values of x in the interval:

(a) $[0, \frac{\pi}{2}]$ (b) ✔$[0, 2\pi]$ (c) $[-\pi, \frac{\pi}{2}]$ (d) $[-\frac{\pi}{2}, 0]$

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