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MCQs-Short Questions: Maths-I
TEXT BOOK OF ALGEBRA AND TRIGONOMETRY CLASS XI
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CHAPTER # 1
NUMBER SYSTEM

I. CHOOSE THE CORRECT ANSWERS.

1. $\sqrt{2}$ is a _____ number.

   (a) Rational (b) irrational (c) Prime (d) None

2. Circumference of any circle = …….
   Length of its diameter

   (a) Л / 2 (b) - Л (c) Л (d) 2 Л

3. Л is a …….

   (a) Whole number (b) Natural number

   (c) Rational Number (d) Irrational number

4. Modulus of complex number 3 – 4i is …….

   (a) 4 (b) - 5 (c) 5 (6) 0

5. Additive inverse of (a, b) is ……..

   (a) (a,- b) (b) (- a, b) (c) (-a, -b) (d) None

6. $Z - \overline{Z}$ = ……..

   (a) Real number (b) Complex number
   (c) 0 (d) -1

7. $Z + \overline{Z}$ = …….

(a) Real number (b) Complex number

(c) 0 (d) None

8. $Z.\overline{Z}$ = …….

(a) |Z| (b) $|Z|^2$ (c) 0 (d) None

9. The set {I, -1} posses closure property w.r.t……

(a) Addition (b) Subtraction

(c) Multiplication (d) None

10. 1in polar form can be written as……

(a) Cos0 + i sin0 (b) Cos Л + i sin Л

(c) Cos π/2 + sinЛ/2 (d) None

11. Z = 1 + í in Polar form can be written as……..

(a) $\sqrt{2}$ (Cos Л/2 + i sin Л/2) (b) $\sqrt{2}$ (Cos Л /4 + i sin Л/4)

(c) $\sqrt{2}$ (Cos Л + i sine Л) (d) None

12. í in polar form can be written as……

(a) (Cos Л/2 + i sin Л/2) (b) Cos (-Л/2) + i sin (-Л/2)

(a) Cos Л + i sin Л (d) None

13. $(-1)^{21/2}$ = …….

(a) -1 (b) +1 (c) í (d) - í

14. If x is not a perfect square then $\sqrt{x}$ =……

(a) Prime number (b) Retinol number

(c) Irrational number (d) None of these

SHORT QUESTIONS

1. Prove that $\overline{Z} + Z$ is real.
2. If $Z = a + \acute{\imath}\, b$ then prove that $Z - \overline{Z}$ is imaginary.
3. If $Z = a + \acute{\imath}\, b$ then prove that $z.\overline{z} = |Z|^2$.
4. Prove that $\overline{Z} = z$ iff Z is real.
5. Find the multiplication Inverse of $2 + 3\,\acute{\imath}$.
6. Express $(4 + \sqrt{-3})\,(3 + \sqrt{-3}$ in the form of a + bi.
7. Express $\sqrt{3} + \acute{\imath}$ in polar form.
8. Express $1 - \acute{\imath}$ in polar form.
9. Factorize $a^2 + 9\,b^2$.
10. (Factorize) $7x^2 + 7y^2$
11. Simplify (1, -2) / (3, 4).
12. Show that $\sqrt{3}$ is an irrational number.
13. Prove that $\overline{(Z1 / Z2)} = \overline{Z1} / \overline{Z2}$, For all $Z \in C$.

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CHAPTER # 2
(SETS, FUNCTION & GROUP)

1. A set has …… objects.

   (a) Identical (b) Not well-defixed

   (c) Distinct (d) None

2. $B = \{x \mid x \in N \wedge 1 \leq x \leq 10\}$

   (a) The descriptive method (b) The tabular method

   (c) Set-builder notation (d) None of these

3. The set {1, 2, 3} and {2, 1, 3} are …….

   (a) Equal (b) Equivalent

   (c) Different (d) Equal and Equalent

4. A Singleton set has…….

   (a) One element (b) No element

   (c) Two element (d) None of these

5. If every element of a set A is an element of set B then ……...

   (a) $A \subset B$ (b) $A \supset b$ (c) $B \subseteq A$ (d) None

6. If B is a super set of A then …….

   (a) $A \subset B$ (b) $B \supset A$ (c) $B \supseteq A$ (d) None

7. A is an improper subset of B when $A \subseteq B$ and…….

   (a) A = B (b) A – B = U (c) $A \cap B = \Phi$ (d) None

8. If A = { } then P (A) = ……

(a) Empty set (b) {0} (c) {Φ} (d) None

9. If n(s) = m, then nP(s) =……..

(a) 2^{m} (b) 2^{m-1} (c) 2^{m+1} (d) 3^{m}

10. A UB is defined as …….

(a) $\{x / x \in A \vee x \in B\}$ (b) $\{x / x \in A \wedge x \in B\}$

(c) $\{x / x \notin A \wedge x \notin B\}$ (d) None

11. A∩B is defined as……

(a) $\{x / x \in A \vee x \in B\}$ (b) $\{x / x \in A \wedge_X \in B\}$

(c) $\{x / x \in A \wedge_X \notin B\}$ (d) None

12. The complement of a set A is defined as ……..

(a) $A^{/} = \{x / x \in U \wedge x \notin A\}$ (b) $A^{/} = \{x/x \in Uvx \in A\}$

(c) $A^{/} = \{x / x \in U \vee x \notin A\}$ (d) None

13. A U Φ =…….

(a) A (b) Φ (c) u (d) None

14. A ∩ Φ =……

(a) A (b) Φ (c) $A^{/}$ (d) None

15. A – Φ =……..

(a) A (b) Φ (c) $A^{/}$ (d) None

16. $(AUB)^{/}$ = …….

(a) $A' \cup B'$ (b) $A' \cup B$ (c) $A' \cap B'$ (d) $A \cap B'$

17. If AxB = BxA then …….

(a) A = B (b) $A \cap B = \Phi$ (c) $A \neq B$ (d) None

18. The function f : A → B is A into B function when …….

(a) Ran f = B (b) Ran f ≠ B (c) Ran f = A (d) None

19. Which one is linear function?

(a) $\{(x, y) \mid y = mx + c\}$ (b) $\{(x, y) \mid y = mx^2 + c\}$

(c) $\{(x, y) \mid y^2 = mx + c\}$ (d) None

20. Which one is quadratic function?

(a) $\{(x, y) \mid y = mx + c\}$ (b) $\{(x, y) \mid y^2 = mx + c$

(c) $\{(x, y) \mid y = ax^2 + bx + c\}$ (d) None

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SHORT QUESTION

1. Write down the power set of A = {9, 10} possible subsets of A are Φ, {9}, {10}, {9, 10} so power set of A = {Φ}, {9}, {10}, {9, 10}

2. If A = {1, 2, 3, 4,} B = {4, 5, 6} then verify the Commutation property of union.

3. If v = {(x, y) | $x^2 + y^2 = 9$, | x | ≤ 3, | y| ≤ 3|} show that r is not a function.

4. r = {(x, y) | y = 2x + 3}then show that r and r^{-1} are functions.

5. Why (N, +) is not a group.

6. State and prove associative property of union and intersection.

7. For any sets A, B ,C Prove that

   (i) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
   (ii) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

8. Let A,B are the subsets of a universal set X then prove that

   (i) $(A \cup B)^C = A^C \cap B^C$
   (ii) $(A \cap B)^C = A^C \cup B^C$

9. Define a group. Is Z the set integer is a group under multiplication.

10. Show that set {1, w, w^2} where $w^3 = 1$ is a group under multiplication.

11. Does the set { 1, -1 } posses the closure property w.r.t

    (i) Addition (ii) multiplication

CHAPTER # 3
(MCQ's)

1. Trivial solution of homogeneous linear equation is

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

2. For non-trivial solution |A| is ……

   (a) $|A| > 0$ (b) $|A| < 0$ (c) $|A| = 0$ (d) None

3. For trivial solution |A| is……..

   (a) $|A| > 0$ (b) $|A| < 0$ (c) $|A| = 0$ (d) None

4. System o linear equations is Inconsistent if ……

   (a) System has no solution (b) System has many solution

   (c) System has unique solution (d) None

5. Minimum number of equation for any system of equations

   (a) 2 (b) 3 (c) 4 (d) 10

6. The matrix A is Hermitian when $(\overline{A})^t$ = ……

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

7. The square matrix A is skew-Hermitian when $(\overline{A})^t$ =……

   (a) A (b) - A (c) $\overline{A}$ (d) $-\overline{A}$

8. The square matrix A is skew – Symmetric when A^t = ……

   (a) 0 (b) A (c) - A (d) None

9. A squar matrix A = {aij} is upper triangular matrix when ……..

(a) aij≠ o for all i > j (b) aij = 0 for all i < j

(c) aij = 0 for all i > j (d) None

10. A square matrix A = {aij}is lower triangular matrix when ……

(a) aij = 0 for all i < j (b) aij = 0 for all i > j

(c) aij ≠ 0 for all i < j (d) aij ≠ 0 for all j < i

11. The co-effect of an element aij denoted by Aij is…….

(a) $(-1)^{i-j}$ Mij (b) $(-1)^{i+j}$ Mij

(c) $(-1)^{ij}$ Mij (d) None

12. The matrix B = $\begin{bmatrix} 1 & 4 \\ 4 & 8 \end{bmatrix}$ is ---------

(a) Singular matrix (b) Non Singular matrix

(c) Symmetric matrix (d) None of these

13. The matrix A = $[aij]_{2x3}$ and B = $[bij]_{3x2}$ are suitable for ……

(a) A + B (b) A – B (c) A B (d) None

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SHORT QUESTION

1. If $A = \begin{bmatrix} 1 & -1 \\ a & b \end{bmatrix}$ and $A^2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then find the value a & b

2. Find the matrix "x" if $\begin{bmatrix} 5 & 2 \\ -2 & 1 \end{bmatrix} x = \begin{bmatrix} 2 & 1 \\ -2 & 1 \end{bmatrix}$

3. If $A = \begin{bmatrix} 5 & 3 \\ 1 & 1 \end{bmatrix}$ verifies that $A\ A^{-1} = I_2$

4. Without expansion show that $\begin{vmatrix} bc & ac & ab \\ 1/a & 1/b & 1/c \\ a & b & c \end{vmatrix} = 0$

5. Show that $\begin{vmatrix} mn & l & l^2 \\ nl & m & m^2 \\ Lm & n & n^2 \end{vmatrix} = \begin{vmatrix} 1 & l^2 & l^3 \\ 1 & m^2 & m^3 \\ 1 & n^2 & n^3 \end{vmatrix}$

6. Show that $(A^{-1})^{-1} = A$ when A is non- singular matrix.

7. Show that $(AB)^{-1} = B^{-1}A^{-1}$ where A and B are non-singular square matrices.

8. With out expansion show that $\begin{vmatrix} \alpha & \beta+\gamma & 1 \\ \beta & \gamma+\alpha & 1 \\ \gamma & \alpha+\beta & 1 \end{vmatrix} = 0$

9. If $A = \begin{bmatrix} i & 1+i \\ 1 & -i \end{bmatrix}$ find $(\bar{A})^t$.

10. Find the rank of $\begin{bmatrix} 1 & -1 & 2 & 1 \\ 2 & -6 & 5 & 1 \\ 3 & 5 & 4 & -3 \end{bmatrix}$

11. If $A = \begin{bmatrix} 1 & 2 & 0 \\ 3 & 2 & -1 \\ -1 & 3 & 2 \end{bmatrix}$ show that

    (i) $A + A^t$ is symmetric (ii) $A - A^t$ is skew symmetric.

CHAPTER # 4
(MCQ's)

1. System of simultaneous equation involves …….. or more equations.

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

2. When discriminant = 0 then the roots are…….

   (a) Real and equal (b) Rational

   (c) Irrational and unequal (d) None

3. If roots of the equation $x^2 + Rx + 1 = 0$ are equal, the value of k will be…

   (a) 3 (2) 4 (3) - 4 (4) 0

4. When $b^2 – 4ac$ is not a perfect square then the roots f $ax^2 + bx + c = 0$ will be…

   (a) Equal (b) Real and equal
   (c) Irrational (d) Rational

5. The nature of roots depends on…….

   (a) Determinant (b) Discriminant

   (c) Synthetic division (d) None

6. Quadratic equation will be perfect square if its roots are……

   (a) Real and equal (b) Red and unequal

   (c) Complex (d) None

7. For S = sum of roots and P = product of roots the quadratic equation will be..

   (a) $x^2 + Sx + P = 0$ (b) $x^2 + Sx – P = 0$
   (c) $x^2 - Sx + P = 0$ (d) $x^2 – Sx – P = 0$

8. For what value equal of k the roots of the equation $x^2+kx+4=0$ are equal.

   (a) ±3 (b) ±4 (c) ± 2 (d) ± 1

9. For what value of k, the sum of roots of the equation x^2 _ kx + 4 = 0 is equal to product of roots.

   (a) - 3 (b) 4 (c) - 4 (d) 2

10. The sum of roots of $ax^2 + bx + c = 0$ will be ……

    (a) c / a (b) -b / a (c) -c / a (d) b / c

11. The product of the roots of $ax^2 + bx + c = 0$ is ------.

    (a) a/b (b) -b/a (c) c/a (d) -c/a

12. The divident = (divisor) (Quotient) + …….

    (a) Quotient (b) Divisor (c) Remainder (d) None

13. The degree of the polynomial $x^4 – 5x^3 + x^2 + 4$ is ……..

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

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SHORT QUESTIONS

1. Solve by factorization $9x^2 – 12x – 5 = 0$

2. Solve by completing square: $x^2 – 2x – 899 = 0$

3. Solve by Quadratic formula: $5x^2 – 13x + 6 = 0$

4. Solve $x^{-2} – 10 = 3x^{-1}$

5. Evaluate $(1 + w – w^2) (1 – w + w^2)$

6. If α, β are the roots of $3x^2 – 2x + 4 = 0$ find the value of $\alpha^3 + \beta^3$

7. For what value of k will the roots of equation $x^2 + kx + 16 = 0$ are equal.

8. Show that $x^3 – y^3 = (x-y) (x- \omega y) (x- \omega^2 y)$.

9. Evaluate $\omega^{28} + \omega^{29} +1$.

10. If ω is a cube root of unity, form an equation whose roots are 2ω and $2\omega^2$.

11. Prove that $(1+ \omega) (1+ \omega^2) (1 + \omega^4) (1 + \omega^8)$…….. 2 n factors = 1

12. Use Synthetic division to find the quotient and remainder.

    When $x^4 – 10x^2 -2x + 4$ is divided by $x + 3$.

13. If α, β are the roots of $x^2 – px – p –c = 0$ then prove that $(1+ \alpha) (1+\beta) = 1 – c$

14. If α, β are the roots of $px^2 +qx +q = 0$. prove that $\sqrt{\alpha / \beta} + \sqrt{\beta / \alpha} + \sqrt{q / p} = 0$

15. Find the condition that one root of $x^2 + px + q = 0$ is double the other.

16. The sum of a positive number and its square is 380. Find the numbers.

CHAPTER # 5
(MCQ's)

1. The conditional equation $1/x = 2$ holds If $x =$ …….

   (a) 1 (b) 2 (c) ¼ (d) ½

2. The identity $2x + 4 = 2(x + 2)$ holds for……

   (a) One value of x (b) Only –ve values of x

   (c) All real values of x (d) None

3. There are ……. Types of rational fraction

   (a) 2 (b) 3 (c) 4 (d) None

4. The rational fraction $P(x) / Q(x)$ is proper rational fraction if……..

   (a) Degree of P(x) = Degree of Q(x)
   (b) Degree of P(x) < Degree of Q(x)
   (c) Degree of Q(x) < Degree of P(x)
   (d) None

5. $(x^2 + x – 1) / Q(x)$ will be improper rational fraction if……..

   (a) Degree of Q(x) = 2 (b) Degree of Q(x) = 3

   (c) Degree of Q(x) = 4 (d) None

6. If Degree of P(x) = 4 Degree of Q(x) = 5 then $P(x) / Q(x)$ will be……

   (a) Improper rational fraction (b) Proper rational fraction

   (c) Identity (d) Conditional equation

7. The process of partial decomposition results in …….

(a) An equation (b) An identity

(c) An Inequality (d) None

8. $1 / (x^2 + 1)^2$ has partial fractions of the form…….

(a) $(Ax + B) / (x^2+1)^2$ (b) $\frac{Ax + B}{x^2+1} + \frac{Cx + D}{(x^2 + 1)^2}$

(c) $\frac{A}{x^2+1} + \frac{B}{(x^2+1)^2}$ (d) $\frac{Ax}{(x^2+1)^2} + \frac{Bx + C}{(x^2+1)^2}$

9. $(x – 1)^2 = x^2 - 2x + 1$ is…….

(a) An equation (b) An inequality

(c) An identity (d) None

10. Partial fraction of $1 / x(x+1)$ are……

(a) $\frac{1}{x} - \frac{1}{x+1}$ (b) $\frac{1}{x+1} + \frac{1}{x}$

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

SHORT QUESTIONS

1. Solve $1 / (x^2 - a^2)$.

2. Solve $x^2 / (x - 2)(x - 1)^2$

3. Solve $1 / (x+1)(x^2+1)$.

4. Resolve $1 / (x^2 - 1)$ into partial fractions.

5. Resolve $x / (x-a)(x-b)(x-c)$ into partial fractions.

6. Resolve $x^2 / (x^2+4)(x+2)$ into partial fractions.

7. Resolve $1 / (x-1)(2x-1)(3x-1)$ into partial fractions.

8. Resolve $1 / (1-ax)(1-bx)(1-cx)$ into partial fractions.

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CHAPTER # 6

1. Which of the following is an A. P?

   (a) 2, 4, 6, …….. (b) 1, 1/2, 1/3, …….

   (c) 1, 5, 11, 18, …. (d) 1, 4, 9, ……..

2. The general term of the sequenced 2, 4, 6, 8, ….. is

   (a) n (b) 2n (c) 2n – 1 (d) n^2

3. The general term of the sequenced -1, 1, -1, 1, -1, ……is

   (a) $(-1)^n$ (b) $(-1)^{n-1}$ (c) $(-1)^{n+1}$ (d) $(-1)^{n+3}$

4. The general term of G. P is

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

5. The 8^{th} term of the sequenced 5, 9, 13, …… is

   (a) 36 (b) 30 (c) 33 (d) 27

6. Which term of the sequenced 3, 9, 15, …….. is 117

   (a) 19 (b) 20 (c) 21 (d) 22

7. The Sum of the Ist n terms of an arithmetic series is ……..

   (a) $S_n = n/2\ [2a – (n-1)d]$ (b) $S_n = n/2[2a + (n-1)d]$

   (c) $S_n = n/2\ [2a + (n+1)d]$ (d) $S_n = a(r^n – 1) / r – 1$

8. The sum of the series -1+1+3+…..+21 is_____

   (a) 110 (b) 120 (c) 130 (d) 140

9. The sum of Ist n terms of an A. series is ……

(a) $S_n = n/2[a - a_n]$ (b) $S_n = n/2\ (a + a_n)$

(c) $S_n = n/2\ [2a+an]$ (d) $S_n = a(r^n - 1) / r - 1$

10. The A. M b/w a & b is …..

(a) $(a + b) / 2$ (b) $2ab / (a + b)$

(c) $(a - b) / 2$ (d) $\pm\sqrt{ab}$

11. The G.M b/w a & b is ____

(a) $2ab / a + b$ (b) $(a + b) / 2$

(c) $\pm\sqrt{ab}$ (d) None

12. G. M b/w 2 & 8 is_____

(a) 5 (b) ± 3.2 (c) - 4 (d) ± 4

13. A. M b/w 4 & 8 is……

(a) $\sqrt{32}$ (b) $-\sqrt{32}$ (c) 6 (d) $64 / 16$

14. H. M b/w a & b is…….

(a) $2ab / a + b$ (b) $(a + b) / 2$

(c) $a^2 + b^2 / 2$ (d) $\pm\sqrt{ab}$

15. H. M b/w 1/8 & 1/20 is _____

(a) $7 / 80$ (b) $1 / \sqrt{160}$

(c) $1 / 14$ (d) 14

16. If A, G & H are A.M, G.M & H.M b/w two numbers respectively then

(a) $A < G < H$ (b) $A > G < H$

(c) $A < G > H$ (d) $A > G > H$

17. A geometric series cannot contain ____ as a term.

(a) -1 (b) 1 (c) 0 (d) None

18. The sequence -1, 1, -1, 1…..is _____

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

19. If a is the Ist term & $r > 1$ is the common ratio of G.P then S_n = ……..

(a) $a(r^n - 1) / r - 1$ (b) $a(r - 1) / r + 1$

(c) ar^n (d) $a(r^n + 1) / r - 1$

20. A Geometric series is divergent if

(a) $r < 1$ (b) $r > 1$ (c) $r = 1$ (d) Both b & c

21. If $a = 3$, $r = 2/3$ then S_∞ = _____

(a) 1 / 9 (b) 9 (c) 8 (d) 1 / 18

22. For an infinite series If $|r| <$ | then S_∞

(a) a / 1-r (b) 1 / 1-r (c) a / r+1 (d) None

23. For an infinite series if $|r| > 1$ then S_∞ = _____

(a) a / 1-r (b) a / r-1 (c) ∞ (d) $a(r^n - 1) / r-1$

24. Which one is convergent series?

(a) $6 + 3 + 3/2 + \ldots\ldots\ldots$ (b) 3, 9, 27, 81,…..

(c) $6 + 12 + 24 + 48 + ...$ (d) 5, 9, 13, 17,…..

25. A sequence is a function whose domain is the set of _____

(a) Integers (b) Natural nos

(c) Rational nos (d) None

26. The arrangement of number formed according to some definite rule is called_____

(a) Sequence (b) Function (c) Series (d) None

27. The population of a town increases geometrically at the rate of 4% per year. If the present population is 200,000 what will be the population after 5 years

(a) $2000,00\ (1.04)^4$ (b) $200,000\ (1.04)$

(c) $200,000\ (1.04)^5$ (d) $200,\ 000\ (1.04)^6$

28. If four number are in A.P & a is the first terms and dis common difference then these numbers are_____

(a) a, a + d , a+ 2d, a + 3d (b) a – b, a, a + d , a + 2d

(c) a – 4d, a – 2d, a + 2d, a + 4d (d) a – 3d, a – d , a + d, a + 3d

SHORT QUESTIONWS

1. Insert two geometric means between 2 and 16.
2. Find the 9^{th} term of A.P 2, 4,6,……
3. If $a_{n-2} = 3n - 11$ find the nth term of the sequence.
4. Find the number of terms in A . P if $a_1 = 3$, $d = 7$, $an = 59$.
5. If 1 / a , 1 / b and 1 / c are in G.P. show that the common ratio is $\pm\sqrt{a / c}$.
6. For what value of n , $a^n + b^n / (a^{n-1} + b^{n-1})$ is the +ve geometric mean between a & b.
7. If $y = 2x / 3 + 4x^2 / 9 + 8x^3 / 27 + \ldots\ldots$ and if $0 < x < 3 / 2$, show that $x = 3y / 2(1+y)$.
8. Find the sum of series $1^2 + 2^2 + 3^2 + \ldots\ldots + 10^2$.
9. Find n so that $a^{n+1} + b^{n+1} / (a^n + b^n)$ may be H.M between a & b.
10. If 1 / a , 1 / b , 1 / c are in A.P, then show that the common difference is (a-c) / 2ac.
11. Find A, G, H if a = -2, b = -6 and show that $G^2 = AH$.
12. If 5 is the H.M between 2 and b , find b.

CHAPTER # 7

1. For a positive integer n n! = _____

   (a) n^2 (b) n (n-1) (n-2)……3.2.1

   (c) n.n (n-1)…2.1 (d) n. 5. 2. 1

2. 0! = ……

   (a) 1 (b) 0 (c) undefined (d) None

3. ${}^nP_r$ in factorial form is……

   (a) n!r / (n-n)! (b) n! / r! (n-r)!

   (c) n! (d) n! –r / n!

4. ${}^nP_o$ =…….

   (a) 1 (b) 0 (c) 0 (d) n!

5. ${}^nP_r$ = ……..

   (a) n (n-1)……(n-r-1) (b) n(n-1) (n-2)….. (n-r+1)

   (c) n(n-1)……(n-r) (d) None

6. ${}^nP_1$ = _____

   (a) n! (b) n! / (n – r)! (c) n (d) 1 / n!

7. ${}^{20}P_3$ = _____

   (a) 20x19x18 (b) 20x3 (c) 20! / 3! (d) 3 / 20!

8. ${}^{n}P_{n-1}$ =_____

(a) (n-1)! (b) n (n-1) (c) n! (d) 1

9. ${}^{9}P_{8}$ =_____

(a) 19 (b) 9! (c) 9x8 (d) 1/9

10. ${}^{n}P_{n}$ = _____

(a) 0 (b) (n-1)! (c) n (d) n!

11. If ${}^{n}P_{2} = 30$ then n =_____

(a) 5 (b) 6 (c) 2 (d) 28

12. ${}^{n}P_{3} = 990$ then n = _____

(a) 3 (b) 990 (c) 11 (d) 8

13. ${}^{n}P_{5} = 990$ then n = _____

(a) n! / (n-5)! (b) 20 (c) 3510 (d) None

14. How many words can be formed from the letters of the word 'ARTICLE' using all the letters

(a) 7! (b) ${}^{7}P_{6}$ (c) ${}^{n}P_{7}$ (d) None

15. The total words can be formed out of the letters of the word 'ASSASSINATION' when all the word are used each word are_____

(a) $\binom{13}{4,3,2,2}$ (b) 13! (c) $\binom{13}{4,3,2}$ (d) None

16. When a selection of objects is made without paying regard to the order of selection, it is called _____

(a) Permutation (b) Combination (c) Set (d) Subset

17. The no. of combinations of n things taken r at a time is defined as ____

(a) $\binom{n}{r} = n! / (n0\text{-}1r)!$ (b) $\binom{n}{r} = n! / r!$

(c) $\binom{n}{r} = n!/r!(n-r)^1$ (d) None

18. $\binom{n}{r} =$ _____

(a) $\binom{n}{n-r}$ (b) $\binom{n}{n+r}$ (c) $\binom{n+r}{n}$ (d) None

19. $\binom{n}{x} = \binom{n}{y}$ then either x = y or x + y = _____

(a) n-1 (b) 2n (c) n (d) None

20. If $\binom{n}{8} = \binom{n}{12}$ then n = _____

(a) 4 (b) 19 (c) 8 (d) 20

21. $\binom{n}{r} + \binom{n}{r-1} =$ _____

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

22. $\binom{n}{r} + \binom{n}{r+1} =$ _____

(a) $\binom{n}{r}$ (b) $\binom{n}{r+1}$ (c) $\binom{n+1}{r}$ (d) $\binom{n+1}{r+1}$

(23). $\binom{15}{10} + \binom{15}{11} =$ _____

(a) $\binom{16}{11}$ (b) $\binom{15}{11}$ (c) $\binom{15}{10}$ (d) $\binom{15}{12}$

24. $\binom{n-1}{r} + \binom{n-1}{r-1} =$ _____

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

25. How many different words can be made of the letters in the words 'UNIVERSITY'?

(a) $5!/2$ (b) $7!/2$ (c) $8!/2$ (d) $10!/2$

26. How many different arrangements may two persons seat them selves if there are only 8 seats in a hall

(a) 8 (b) 56 (c) 8! (d) $8!/2$

27. How many different words are possible of the letters in th word 'PULLY'.

(a) 60 (b) 120 (c) 125 (d) 720

28. If ${}^{n}P_5 = 210\ {}^{n}P_2$ then n =_____

(a) 9 (b) 13 (c) 14 (d) 15

29. In how may different ways can eight books be arranged on a shelf?

(a) 8! (b) 8 (c) 56! (d) 56

30. The number of committees of seven person formed from a group of 10 persons will be _____

(a) 71 (b) 101 (c) 100 (d) 120

31. If S is a sample space & A $\subseteq$ S is an event them P (A) =_____

(a) n(A) / n (S) (b) n (S) / n (A)

(c) n (S-A) / n (S) (d) n(A)

32. If A $\subset$ S and A = Φ then P (A) = _____

(a) 0 (b) 1 (c) 4 (d) 5

33. If A $\subset$ S & A = S then P (A) = _____

(a) 0 (b) 1 (c) 4 (d) n (S)

34. Ab dice is thrown then the probability of getting an odd number is _____

(a) 1/6 (b) ½ (c) 2/6 (d) 5/6

35. If A & B are mutually disjoint events then P (AUB) = _____

(a) P (A) + P (B) – P (P$\cap$B) (b) P (A) – P (B)

(c) P (A) + P (B) (d) None

SHORT QUESTIONS

1. Find the value of n when ${}^{n}P_4 : {}^{n-1}P_3 = 9:1$.
2. Prove from the first principle that ${}^{n}P_r = n.\ {}^{n-1}P_{r-1.}$
3. How many signals can be given by 5 flags of different colours using 3 flags at a time.
4. How many signals can be given by six flags of different colours when any number of flag can be use at a time.
5. How many words can be formed from the letters of the following words using all letters when no letter is to be repeated.

   (i) PLANE (II) OBJECT (III) FASTING.
6. How many three digit numbers can be formed by using each one of the digits 2, 3 , 5, 7, 9 only once
7. In how many ways can 8 books including 2 on English be arranged on a shelf in such a way that the English books or never together.
8. In how many ways can 5 boys and 4 girls be seated on bench that the girls and the boys occupy alternate seat.

CHEPTER # 8

1. $1 + 2 + 3 + \ldots\ldots\ldots + (n-1) =$ _____

   (a) $\frac{n(n+1)}{2}$ (b) $\frac{n(n-1)}{2}$ (c) $\frac{(n-1)(n+1)}{2}$ (d) $\left[\frac{n(n+1)}{2}\right]^2$

2. $1 + 3 + 5 + \ldots\ldots + (2n-1) =$ _____

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

3. $1^2 + 3^2 + 5^2 + \ldots\ldots =$ _____

   (a) $\frac{n(n+1)(2n-1)}{6}$ (b) 9 (c) $\left[\frac{n(n+1)}{4}\right]^2$ (d) None

4. $2^2 + 4^2 + 6^2 + \ldots\ldots =$ _____

   (a) $\frac{2n(n+1)(2n+1)}{6}$ (b) $\frac{4n(n+1)(2n+1)}{6}$

   (c) $\frac{4n(n+1)(2n+1)}{3}$ (d) None

5. Middle term in the expansion of $(a + b)^n$ if n is even is_____

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

6. Co-efficient of the term containg x^5 in the expansion of $(1-x^2)^6$ is _____

   (a) $\binom{6}{4}$ (b) $\binom{6}{5}$ (c) $-\binom{6}{5}$ (d) None

7. Coefficient of the middle term in the expansion of $(a + b)^{20}$ is ____

   (a) $\binom{20}{}$ (b) $\binom{20}{}$ (c) $\binom{20}{}$ (d) None

8. Coefficient of 8^{th} term in the expansion of $(x + y)^{16}$ is_____

(a) $\binom{8}{0}$ (b) $\binom{16}{8}$ (c) $\binom{16}{7}$ (d) $\binom{16}{9}$

9. Sum of binomial coefficients is_____

(a) 2^n (b) $\binom{16}{n}$ (c) $2n$ (d) n^2

10. Number of terms in the expansion of $(a + b)^n$ if $n \in N$ is _____

(a) n (b) n + 1 (c) n – 1 (d) 2^n

11. Sum of the coefficients in the expansion of $(a + b)^6$ is _____

(a) 7 (b) $\binom{7}{7}$ (c) 32 (d) 64

12. No. of terms in the expansion of $1 / (a + b)^4$ are _____

(a) 4 (b) 5 (c) 6 (d) None

13. $n \notin N$ then the expansion $(1 + x)\, n = 1 + nx + n\,\frac{(n-1)}{2!}\, x^2 + \ldots$ is valid if

(a) $|x| > 1$ (b) $|x| = 1$ (c) $|x| < 1$ (d) None

14. A term independent of x in the expansion of $(x + 1/x)^7$ is _____

(a) $\binom{7}{4}$ (b) $\binom{7}{5}$ (c) $\binom{7}{6}$ (d) None

15. The general term in the expansion of $(a+b)^n$ is _____

(a) $\binom{n}{r} a^r b^r$ (b) $\binom{n}{r} a^r b^{n-r}$

(c) $\binom{n}{r} a^{n-r} b^r$ (d) $\binom{n}{r} a^{n-r} b^{n-r}$

16. Last term of the expansion $(1+x)^n$ if $n \notin N$ is_____

(a) $\binom{n}{n}$ (b) n (c) n! (d) None

17. Last terms of the expansion of $(x - \sqrt{y})^{12}$ is _____

(a) x^{11} (b) x^{13} (c) y^{12} (d) y^6

18. Ist term of the expansion of $½ (4 + x)^{½}$ is_____

(a) $4 + ½ x$ (b) $½ (4 + ½ x)$ (c) $1 + x/8$ (d) None

19. The term independent of y in the expansion of $(y + 1/\sqrt{y})^9$ is _____

(a) 5 (b) 6 (c) 7 (d) 9

20. The sum of the exponents of a and b for each term in the expansion of $(x + y)^n$ is _____

(a) n (b) n+1 (c) x^n (d) $n x^n$

SHORT QUESTIONS

1. Use binomial expansion field $(1+ \sqrt{2})^3$.
2. What is the coefficient of b2 in $(a – 2b)^3$.
3. What is the middle term of (3x + 1/2x).
4. Use Binomial Expansion find the value of $\sqrt{99}$ upto 3 places of decimal.
5. Expend (1 + x)-1/3 upto three terms $5\sqrt{32}$
6. If x is so small that its square and higher power of x can be neglected then higher power of x can be neglected them show that $1 + x / \sqrt{1-x} = 1 + 3x / 2$
7. Simplify $(a+ \sqrt{2x})^4 + (a - \sqrt{2x})^4$.
8. Find the term involving a^4 in the expansion $(2 / x – a)^a$
9. If x is very nearly equal to 1. Prove that $Px^p – qx^q = (P – q) x^{p+q}$.

CHAPTER # 9

1. Trigonometry is the branch of math's in which we study……..

   (a) Rectangle (b) Square (c) Triangle (d) Quadrilateral

2. An angle is the square is the union of two…….rays having a common vertex.

   (a) Collinear (b) Non-collinear

   (c) Opposite (d) Perpendicular

3. An angle greater than 90^0 is called…..angle

   (a) Acute (b) Right (c) Alternate (d) None

4. If a circle is divided into 360 equal parts then cache part is called -----

   (a) Radian (b) Degree (c) Minute (d) Quadrant

5. The angle of an arc of a circle where arc length is equal to the radius of the circle is called…

   (a) Radian (b) Degree (c) Minute (d) Right angle

6. 'Л 'is the ratio between of the circle

   (a) Radius and angle (b) Diameter and arc length

   (c) Diameter & Circumference (d) Radius & circumference

7. 180^0 is equal to……radius

   (a) Л / 2 (b) Л (c) 2 Л (d) 3 Л / 2

8. 1 Radian is equal……..

   (a) 60^0 (b) 180^0 (c) 180^0 / Л (d) Л / 180^0

9. Relation between the lengths of a circular arc 'ℓ' & the radian measure of its central angle 'θ' is …

(a) $r = l / \theta$ (b) $l = r / \theta$ (c) $\theta = l\, r$ (d) None

10. The area 'A' of a sector of a circular region of radius 'r' & central angle θ is $A =$……

(a) $r^2 \theta$ (b) $\frac{1}{2} r^2 \theta$ (c) $\frac{1}{2} r \theta^2$ (d) $1/3 r \theta^2$

11. The length of the are cut off on a circle of radius r = 3cm, by a central angle $\theta = 5\pi / 6$ is….

(a) $\pi / 5$ cm (b) $2\pi / 5$ cm (c) $5\pi / 2$cm (d) None

12. The radius of a circular sector having area A = 200 cm^2 & central angle $\theta = 2$ rads is….

(a) $100\sqrt{2}$ cm (b) 141.4cm (c) 1.1414cm (d) 14.14 cm

13. $\theta = (20/\pi)^0$ is equal…..radians

(a) 20/11 rad (b) 1/9 rad (c) 9/11 rad (d) 1/180 rad

14. How many radians does the hear hand of a clock tern in one hour

(a) $\pi/6$ rads (b) π rads (c) 2π rads (d) $\pi/2$ rads

15. $Sec^2\theta - 1$ = …….

(a) $Cosec^2 \theta$ (b) $Cos^2 \theta$ (c) $Tan^2 \theta$ (d) $Cot^2 \theta$

16. Where will the terminal side lie for the angle $\theta = -500^0$

(a) 1st Quadrant (b) 2nd quadrant (c) 3rd Qd. (d) 4th Qd

17. Sign of Cot (-130^0) is……

(a) Negative (b) Positive (c) Both –ve & +ve (d) None

18. Sign of Cos (1000^0) is……

(a) + ve (b) - ve (c) + ve & -ve (d) None

19. $(1-\text{Cos}^2\,\theta)\,(1+\text{Cot}^2\,\theta)$ = …….

(a) $\text{Sin}^2\,\theta$ (b) $\text{Cos}^2\,\theta$ (c) $\text{Cosec}^2\,\theta$ (d) None

20. Cosx (tan x + cot x) = ……

(a) Sinx (b) Cosx (c) Cosec x (d) Sec x

21. In which quadrant does the terminal side lie of Sin $\theta < 0$ & tan $\theta > 0$

(a) 1^{st} Q (b) 2^{nd} Q (c) 3^{rd} Q (d) 4^{th} Q

22. Quadrant is a ……. Part of a revolution

(a) 1/3 (b) ¼ (c) ½ (d) 1/8

23. 1 quadrant = …….

(a) 90^0 (b) 45^0 (c) 180^0 (d) 360^0

24. Sin 37^0 = ……..

(a) Cos 37^0 (b) Sin53^0 (c) Cos53^0 (d) Cos133^0

25. Two angles $\theta + \Phi$ are called supplementary angles if $\theta + \Phi$ = ….

(a) 90^0 (b) 180^0 (c) 270^0 (d) 360^0

26. Cot (30^0) = ……..

(a) Tan 20^0 (b) Cos 60^0 (c) sin60^0 (d) tan60^0

27. Cos (120^o) = ……..

(a) - ½ (b) $\sqrt{3}/2$ (c) $-\sqrt{3}/2$ (d) ½

28. Sin (-180^0) = ….

(a) - 1 (b) + 1 (c) 0 (Zero) (d) ∞

29. Tan (-990^0) = …….

(a) - ∞ (b) ∞ (c) - 1 (d) + 1

30. Cos (-305^0) = ……..

(a) Cos 50^0 (b) Sin 35^0 (c) Cos 35^0 (d) Sin 55^0

31. Cos 30^0 Cos 60^0 + sin30^0 sin60^0 = ……

(a) ½ (b) - ½ (c) $-\sqrt{3}/2$ (d) $\sqrt{3}/2$

32. Cos90^0 – c0s30^0 = …….

(a) - 2sin60^0 sin30^0 (b) - 2sin60^0cos30^0

(c) 2sin60^0Sin30^0 (d) None

33. Cos (-15JI) = …….

(a) - 1 (b) + 1 (c) 0 (d) None

34. Sin (-1980^0) = …….

(a) - 1 (b) + 1 (c) 0 (d) ∞

SHORT QUESTION

1. What is the measure of the angle between the lands of a watch at 40' clock?
2. What is the length of the arc intercepted on a circle of radius 14cm by the arm of central angle of 45^0.
3. Find the radius of the circle in which the arms of a central angle of measure Radian cut off an arc of length 35cm.
4. A railway train is running on a circular track of radius 500 m at the rate of 30 km per hour, through what angle will it turn in 10 Sec.
5. Find the value of the remaining trigonometric function $\sin \theta = 12 / 13$ and the terminal arm of the angle is in the II quadrant.
6. Find $\cos \theta$ If $\tan \theta = -1 / 3$ and θ lies in II quadrant.
7. Prove that $\sin^2 \pi / 6 + \sin^2 \pi / 3 + \tan^2 \pi / 4 = 2$.
8. Find x if $\tan^2 45^0 - \cos^2 60^0 = x \sec 45^0 \cos 45^0 \tan 60^0$.
9. Find the values of the trigonometric function of angles

   (i) $-9 \pi / 2$ (ii) $235 \pi / 2$ (iii) 1530^0.

10. Prove the following identities

    (i) $\cos \theta + \tan \theta \sin \theta = \sec \theta$
    (ii) $\sec^2 - \operatorname{cosec}^2 \theta = \tan^2 \theta - \cot^2 \theta$

CHAPTER # 10

1. Sin (α-β) = ……

   (a) Sin α cos β + cos α sin β (b) Sin α cos β – cos α sin β

   (c) Cos α cos β – sin α sin β (d) cos α cos β + sin α sin β

2. Cos (α + β) = ……

   (a) Sin α cos β + cos α sin β (b) Sin α cos β - cos α sin β

   (c) cos α cos β - sin α sin β (d) cos α cos β + sin α sin β

3. Tan (-β) = ……..

   (a) tan β (b) - tan β (c) cot β (d) cos β

4. Cos (270^0- θ) = ……

   (a) - sin θ (b) sin θ (c) -cos θ (d) cos θ

5. Tan (270^0 + θ) = ……..

   (a) tan θ (b) -tan θ (c) cot θ (d) -cot θ

6. Sin (180^0 – θ) = ……

   (a) cos θ (b) sin θ (c) -sin θ (d) - cos θ

7. Tan (45^0 – θ) =……

   (a) $\frac{1 + \tan \theta}{1 - \tan \theta}$ (b) $\frac{\cos \theta + \sin \theta}{\cos \theta - \sin \theta}$

   (c) $\frac{1 - \tan \theta}{1 + \tan \theta}$ (d) $\frac{\sin \theta + \cos \theta}{\sin \theta - \cos \theta}$

8. Cot 15^0 = ……

(a) $\sqrt{3} - 1 / \sqrt{3} + 1$ (b) $1 - \sqrt{3} / 1 + \sqrt{3}$

(c) $1 + \sqrt{3} / 1 - \sqrt{3}$ (d) $\sqrt{3} + 1 / \sqrt{3} - 1$

9. Cos (200^0 $40^/$) = …….

(a) -sin (20^0 $40^/$) (b) sin (20^0 $40^/$)

(c) Cos (20^0 $40^/$) (d) - Cos20^0 $40^/$

10. $\frac{\sin \alpha}{\text{Sec}4\alpha} + \frac{\text{Cos } \alpha}{\text{Cosec}4\alpha} =$ .....

(a) sec 5α (b) sin 5 α (c) Cosec 5 α (d) Cos 5α

11. Sin β = ……

(a) 2sin β cos β (b) Sin β /2 cos β / 2

(c) 2sin β / 2 cos β / 2 (d) None

12. Cos 2α = ……..

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

13. Tan2 θ =…….

(a) $\frac{2\tan \theta}{1-\tan^2\theta}$ (b) $\frac{2\tan \theta}{1+\tan^2\theta}$ (c) $\frac{1-\tan \theta}{1+\tan \theta}$ (d) $\frac{1+\tan \theta}{1-\tan \theta}$

14. $\text{Cos}^2 15^0 - \sin^2 15^0$ =……..

(a) $\text{Cos}^2 15^0$ (b) $\text{Cos}^4 30^0$ (c) ½ (d) $\sqrt{3} / 2$

15. Sin θ/2 = …….

(a) $\pm\sqrt{\frac{1+\cos}{2}}$ (b) $\pm\sqrt{\frac{1-\cos\theta}{2}}$ (c) $\pm\sqrt{\frac{1-\cos\theta}{1+\text{Cos}\theta}}$ (d) None

16. $\frac{\text{Sin } \alpha}{2}$ = ……

(a) Sin α/2 cos α/2 (b) 2sinα/2 cos α/2

(c) 2sin α cos α (d) sin α / 2

17. $\text{Cos}^4\theta - \text{Sin}^4\theta$ =……..

(a) Sec2 θ (b) co2 θ (c) $\frac{\text{cos2 } \theta}{\text{Sin } \theta}$ (d) 1/sec2 θ

18. $\frac{2\tan \alpha}{1+\tan^2\alpha}$ =……

(a) Tan α (b) tan2 α (c) Sin2 α (d) tan α/2

19. $(\text{Sin } \theta / 2 - \cos \theta / 2)^2$ =……..

(a) 1 - sin θ (b) 1 + sin θ (c) 1 – sin2 θ (d) 1 + sin2 θ

20. 2cos α sin β = ……

(a) Sin (α+β) + sin (α-β) (b) Sin (α+β) – sin (α-β)

(c) Cos (α+β) + cos (α-β) (d) Cos (α+β) – cos (α-β)

21. $2\cos 65^0 \cos 15^0$ =……..

(a) $\text{Cos}80^0 - \cos 50^0$ (b) $\text{Cos } 50^0 - \cos 80^0$

(c) $\text{Cos}80^0 + \cos 50^0$ (d) None

22. 2sin 3θ cos5 θ =……..

(a) Sin (8 θ) + sin (-2 θ) (b) Sin8 θ – sin2 θ

(c) Sin2 θ – sin8 θ (d) None

23. $2\sin\theta \sin\Phi$ =……..

(a) $\cos(\theta + \Phi) - \cos(\theta - \Phi)$ (b) $\cos(\theta - \Phi) - \cos(\theta + \Phi)$

(c) $\cos2\theta - \cos2\Phi$ (d) $\cos(\Phi - \theta) + \cos(\Phi + \theta)$

24. $\cos84^0 - \cos76^0$ =……

(a) $-2\sin(80^0)\cos(4^0)$ (b) $2\sin80^0 \cos4^0$

(c) $2\cos80^0 \sin4^0$ (d) $-2\sin80^0\sin4^0$

25. $\sin\frac{5\alpha}{3} - \sin\frac{5\alpha}{6}$ =……..

(a) $2\sin\frac{5\alpha}{6}\cos\frac{5\alpha}{2}$ (b) $2\cos\frac{5\alpha}{6}\sin\frac{5\alpha}{2}$

(c) $-2\cos\frac{5\alpha}{2}\sin\frac{5\alpha}{6}$ (d) None

26. $\frac{\sin75^0 - \sin15^0}{\cos75^0 + \cos15^0}$

(a) $\sin60^0$ (b) $\cos30^0$ (c) $1 / \sqrt{3}$ (d) $\sqrt{3} / 2$

27. $\frac{\sin3\alpha - \sin\alpha}{\cos^2\alpha - \sin^2\alpha}$ =……..

(a) $2\cos\alpha$ (b) $\cos2\alpha$ (c) $2\sin\alpha$ (d) $\sin2\alpha$

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SHORT QUESTION

1. Prove that $\sin(180^0 + \alpha)\sin(90^0 - \alpha) = -\sin\alpha\cos\alpha$.

2. Prove that $\cos 306^0 + \cos 234^0 + \cos 162^0 + \cos 18^0 = 0$.

3. If α, β, γ are the angles of a triangle ABC then prove that

   (i) $\sin(\alpha + \beta) = \sin\gamma$

4. Prove that $\tan(45^0 + A)\tan(45^0 - A) = 1$.

5. Prove that $\sin(45^0 + \alpha) = 1/\sqrt{2}(\sin\alpha + \cos\alpha)$.

6. Express $2\sin 7\theta\cos 3\theta$ as sum or difference of angles.

7. Express $\sin 8\theta - \sin 4\theta$ as product.

CHAPTER # 11

1. ‘Sine’ and ‘cosine’ are periodic function whose period is …….

   (a) л / 2 (b) л (c) 2 л (d) 4 л

2. Tangent and cotangent are periodic function whose period is…….

   (a) л/2 (b) л (c) 2 л (d) 4 л

3. The period of sec and cosec function is ……..

   (a) л/2 (b) л/4 (c) 3л/4 (d) 2л

4. The domain of sine & cosine is ……..

   (a) $-\text{л}/2 \leq x \leq \text{л}/2$ (b) $-\text{л}/2 < x < \text{л}/2$

   (c) $0 \leq x \leq \text{л}$ (d) None

5. The rang of y = sin x & y = Cos x is …….

   (a) $0 \leq y \leq 1$ (b) $-1 \leq y \leq 0$ (c) $-1 \leq y \leq 1$ (d) $-1 < y < 1$

6. Tan 180^0 = ……

   (a) 0 (b) 1 (c) -1 (d) ∞

7. Sin (315^0) = ……..

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

8. In 1^{st} Quadrant the value of sine is……..

   (a) Increase from 0 to 1 (b) Increase from -1 to 0

   (c) Decrease from 1 to 0 (d) Decrease from 0 to -1

9. In 3rd Q. the value of cosines……..

(a) Increases (b) decreases (c) Constt (d) None

10. Cos (240^0) =……

(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{-\sqrt{3}}{2}$ (c) ½ (d) - ½

SHORT QUESTIONS

1. Find the period of

   (i) Cosec x / 4 (ii) tan x / 7 (iii) 3Cos 2x / 3

   (vi) Sin 10x (v) tan 4x / 3.

2. Find the domain and wrangle of the following function.

   (i) Sin x (ii) Cos x (iii) tan x

3. Find the periods of Cos πx / 2.

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CHAPTER # 12

1. A triangle which is not right angled is called.

   (a) Acute – angled (b) Obtuse – angle
   (c) Oblique (d) isosceles

2. In triangle c2 = a2 + b2 – 2ab Cos r is called

   (a) Law of Sine's (b) Law of Cosines
   (c) Law of tangents (d) None of these

3. In any triangle, with usual notations, Sin α / 2 is equal to.

   (a) $\sqrt{(s + b)(s + c)} / bc$ (b) $\sqrt{(s + b)(s - c)} / bc$

   (c) $\sqrt{(s - b)(s - c)} / bc$ (d) $\sqrt{(s - a)(s - c)} / ac$

4. In any triangle, with usual notations, Cos α / 2 is equal to.

   (a) $\sqrt{s(s - a)} / ab$ (b) $\sqrt{s(s - b)} / ac$

   (c) $\sqrt{s(s - c)} / ab$ (d) $\sqrt{s(s - a)} / ab$

5. In any triangle, with usual notations, tan α / 2 is equal to.

   (a) $\sqrt{(s - b)(s - c)} / s(s - a)$ (b) $\sqrt{(s - b)(s - c)} / s(s + a)$

   (c) $\sqrt{(s - a)(s - b)} / s(s - c)$ (d) $\sqrt{(s - a)(s - c)} / s(s - b)$

6. In any triangle, with usual notations, Sec α / 2 is equal to.

   (a) $\sqrt{bc} / s(s - a)$ (b) $\sqrt{ac} / s(s - b)$

   (c) $\sqrt{ab} / s(s - c)$ (d) $\sqrt{ac} / (s - a)(s - c)$

7. A triangle has …. Important elements.

(a) 3 (b) 4 (c) 5 (d) 6

8. In any triangle ABC, law of Sine's is

(a) $\text{Cos } A = \frac{b^2 + c^2 + a^2}{2bc}$

(b) ½ ac Sin B

(c) A / Sin A = B / Sin B = C / Sin C

(d) a / Sin A = b / Sin B = C / Sin C

9. When two sides and its included angle is give, then area of triangle is given by

(a) ½ ab Sin C (b) ½ ac Sin B

(c) ½ bc Sin C (d) All f these

10. The circle which passes through the vertices of a triangle is called

(a) In-Circle (b) e-Circle
(c) Circum Circle (d) None of these

11. The circle which touches the sides of a triangle internally is called

(a) In-Circle (b) e-Circle
(c) Circum centre (d) Centroid

12. The point of Concurrency of the right – bisectors of the sides of a triangle is called

(a) In-Centre (b) Orthocenter
(c) Circum centre (d) Centroid

13. The point of Concurrency of the medians of a triangle is called

(a) Circum centre (b) Centroid
(c) In – Centre (d) Ortho Centre

14. The point of Concurrency of the altitudes of a triangle is called

(a) Centroid (b) Ortho Centre
(c) Circum centre (d) In – Centre

15. The Circum – radius R of a triangle is given by

(a) $c / \sin \alpha$ (b) $b / \sin \beta$
(c) $abc / 4\Delta$ (d) $4abc / \Delta$

16. The In – radius r of a triangle is given by

(a) Δ / S (b) $\Delta / S - C$
(c) $\Delta / S - b$ (d) $\Delta / S - C$

17. With usual notations $r\, r_1\, r_2\, r_3 =$

(a) Δ (b) Δ^2 (c) $\frac{abc}{\Delta}$ (d) $\frac{\Delta}{abc}$

18. In usual notations, $r_1 =$

(a) $\frac{\Delta}{S}$ (b) $\Delta / S - a$ (c) $\Delta / S - b$ (d) $\Delta / S - c$

19. e – radius Corresponding to angle A is

(a) $\Delta / S - a$ (b) $\Delta / S - b$ (c) $\Delta / S - c$ (d) Δ / S

20. In any triangle ABC, $\frac{\sin A + \sin B}{\sin A - \sin B} =$

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

21. In any triangle ABC, $c \cos A + a \cos C =$

(a) a (b) b (c) c (d) a Cos B

22. In usual notation $\frac{1}{} + \frac{1}{} + \frac{1}{} =$

$\varepsilon_1 \quad \varepsilon_2 \quad \varepsilon_3$

(a) $\frac{\Delta}{\varepsilon}$ (b) $\frac{\varepsilon}{\Delta}$ (c) $\frac{1}{r}$ (d) $1 / \varepsilon r_2 r_3$

23. In any triangle ABC, a Cos B + b Cos A

(a) a (b) b (c) c (d) b Cos C

24. If the angles of a triangle are in the ratio 1 : 2 : 3, then the sides are in the ratio

(a) $1 : 2 : \sqrt{3}$ (b) $1 : \sqrt{3} : 2$ (c) $\sqrt{3} : 1 : 2$ (d) $\sqrt{3} : 2 : 1$

25. If 2 Sin A /2. Sin C / 2 = Sin B / 2 then a, b, c are in

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

26. In any triangle ABC, if $m < c = 60^0$ then (a + b + c) (a + b – c) =

(a) ab (b) 2ab (c) 3ab (d) 3bc

27. In any triangle ABC $2b \text{ Cos}^2 C/2 + 2c \text{ Cos}^2 B/2 =$

(a) (a – b + c) (b) (a + b + c)
(c) (a + b – c) (d) (a – b – c)

28. The law of Cosines states that is a general triangle $c^2 = a^2 + b^2$ …..

(a) 2bc Cos α (b) 2ab Cos α (c) 2ab Cos r (d) ab Cos r

29. The law of Cosines states that in a general triangle $a^2 = b^2 + c^2$ ….

(a) 2bc Cos α (b) 2ac Cos β (c) 2ab Cos r (d) ac Cos β

30. In usual notations r_2 =

(a) Δ / S (b) Δ / S – a (c) Δ / S – b (d) Δ / S – c

SHORT QUESTIONS

1. A vertical pole is 8 m high and the length of its shadow is 6 m. what is the angle of elevation of the Sun at that moment.

2. At the top of a cliff 80 m high, the angle of depression of a boat is 12^0. How for 13 the boat from the cliff

3. Find "C" of the right triangle ABC in which $r = 90^{0,}$ $\alpha = 37\ ^0$'20, a = 243.

4. Find a in Δ ABC when $\beta = 60^0$, $r = 15^0$, $b = \sqrt{6}$.

5. Find ∞ in Δ ABC when a = 7, b = 7, C = 9.

6. Find the measure of greatest angle if sides of the triangle are 16, 20, and 33.

7. Find the area of Δ ABC when

   (i) a = 4.33, b = 9.25, $r = 56^0\,44^{/}$
   (ii) c = 32, $\alpha = 47^0 24^{/}$, $\beta = 70^0 16^{/}$
   (iii) a = 18, b = 24, c = 30.

8. The area of triangle is 2437. If a = 79 and c = 97 then find the angle β.

9. Show that $r_1 = s \tan \alpha/2$.

10. Find r_1, r_2, r_3 of Δ ABC when a = 13, b = 14, c = 15.

11. Prove that is $r\, r^1\, r^2\, r^3 = \Delta^2$.

12. Prove that is $r^1\, r^2\, r^3 = r\, S^2$.

13. Prove that is $(r^1 + r^2) \tan r / 2 = C$.

CHAPTER # 13

1. The inverse exists only for the function which is…..

   (a) One to one (b) onto (c) into (d) All of these

2. To make a trigonometric function one to one, its …. Is restricted.

   (a) Domain (b) period (c) Range (d) None

3. The domain of $y = Sin^{-1}$ is.

   (a) $(-\pi, \pi)$ (b) $(-\pi / 2. \pi / 2)$
   (c) (-1, 2) (d) None of these

4. Inverse sine function is written as……..

   (a) $(\sin x)^{-1}$ (b) $\sin^{-}1$
   (c) arc $\sin^{-1} x$ (d) arc $\sin^{-1}$

5. The domain of $y = \sin^{-1} x$ function is…

   (a) (-1, 1) (b) $(-\infty, \infty)$ (c) $(0, \pi)$ (d) $(-\pi/2, \pi/2)$

6. The range of $y = \sin^{-1}$ function is….

   (a) (-1, 1) (b) $(-\infty, \infty)$ (c) $(0, \pi)$ (d) $(-\pi/2, \pi/2)$

7. The inverse cosine function can be written also written as

   (a) $(\text{Cos } x)^{-1}$ (b) Cos x^{-1} (c) arc Cos x (d) arc $\text{Cos}^{-1} x$

8. The domain of = $\cos^{-1} x$ function is…

   (a) (-1, 1) (b) $(-\infty, \infty)$ (c) $(0, \pi)$ (d) $(-\pi/2, \pi/2)$

9. The range of $y = \cos^{-1} x$ function is…

(a) (-1, 1) (b) $(-\infty, \infty)$ (c) $(0, \pi)$ (d) $(-\pi/2, \pi/2)$

10. Inverse tangent function can be written also written as

(a) $(\tan x)^{-1}$ (b) $\tan x^{-1}$ (c) arc tan x (d) $\text{arc tan}^{-1} x$

11. $\text{Sin}^{-1} 1/x$ = …….

(a) Sin x (b) $\text{Cosec}^{-1} 1/x$ (c) cosec x (d) $\text{cosec}^{-1} x$

12. $\text{Cos}^{-1} 1/x$ = …….

(a) $\text{Sec}^{-1} x$ (b) Cos x (c) $\text{Sec}^{-1} 1/x$ (d) Sec x

13. $\text{Tan}^{-1} 1/x$ = …….

(a) $\text{Cot}^{-1} 1/x$ (b) $\text{Cot}^{-1} x$ (c) Tan x (d) Cot x

14. $\text{Sin}^{-1} (-x)$ = ……..

(a) $-\text{Sin}^{-1} x$ (b) $\text{Sin}^{-1} x$ (c) $\pi + \text{Cos}^{-1} x$ (d) $-\text{Cos}^{-1} x$

15. $\text{Cos}^{-1} (-x)$ = ……

(a) $\pi + \text{Cos}^{-1} x$ (b) $\pi - \text{Cos}^{-1} x$
(c) $\pi + \text{Sin}^{-1} x$ (d) $\pi - \text{Sin}^{-1} x$

16. $\text{Tan}^{-1} (-x)$ = …….

(a) $\text{Tan}^{-1} x$ (b) $\text{Cot}^{-1} x$ (c) $-\text{Tan}^{-1} x$ (d) $-\text{Cot}^{-1} x$

17. If $\text{Sin}^{-1} ½ = \pi/2 - x$, then x = ……..

(a) 0 (b) $\pi / 3$ (c) $\pi / 6$ (d) $\underline{\pi} + x$

18. $\text{Sin}^{-1} A + \text{Sin}^{-1} B = \ldots..$

(a) $\text{Sin}^{-1}(A\sqrt{1 - B^2} - B\sqrt{1 - A^2})$ (b) $\text{Sin}^{-1}(A\sqrt{1 - B^2} \mp B\sqrt{1 - A^2})$

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

19. $\text{Sin}^{-1} A - \text{Sin}^{-1} B = \ldots\ldots.$

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

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

20. $\text{Cos}^{-1} A + \text{Cos}^{-1} B = \ldots\ldots..$

(a) $\text{Cos}^{-1}[AB - \sqrt{(1 - A^2)(1 - B2)}]$ (b) $\text{Cos}^{-1}[AB + (\sqrt{1 - A^2})(1 - B^2)]$

(c) $\text{Cos}^{-1}[AB - \sqrt{(1 + A^2)(1 - B^2)}]$ (d) $\text{Cos}^{-1}[AB - \sqrt{(1 - A^2)(1 + B^2)}]$

21. Cos-1 A – Cos-1 B = ……

(a) $\text{Cos}^{-1}[AB - \sqrt{(1 - A^2)(1 - B2)}]$ (b) $\text{Cos}^{-1}[AB + (\sqrt{1 - A^2})(1 - B^2)]$

(c) $\text{Cos}^{-1}[AB - \sqrt{(1 + A^2)(1 - B^2)}]$ (d) $\text{Cos}^{-1}[AB - \sqrt{(1 - A^2)(1 + B^2)}]$

SHORT QUESTION

1. With out using tables / calculators, evaluate

   (i) Sin^{-1} (ii) $\text{Sin}^{-1}(-1)$ (iii) $\text{Cos}^{-1}(\sqrt{3}/2)$

   (vi) $\text{Tan}^{-1}(-1/\sqrt{3})$ (v) Cosec-1 $(-2/\sqrt{3})$

2. Find the value of

   (i) $\text{Sin}[\text{Cos}^{-1}(\sqrt{3}/2)$ (ii) $\text{Sec}[\text{Sin}^{-1}(1/2)]$

   (iii) $\text{Sec}[\text{Cos}^{-1}(1/2)]$ (vi) $\text{Tan}[\text{Sin}^{-1}(-1/2)]$

3. Show that $\text{Cos}^{-1}\ 12/13 = \text{Sin}\ -1\ 5/13$

4. Show that Cos-1 $4/5 = \text{Cot}^{-1}\ 4/3$

5. Show that Cos (2 Sin-1 x) $1 - 2x^2$

6. Cos (Sin-1 x) = $\sqrt{1 - x^2}$

7. Cos Sin (2 Cos-1 x) = $2x\sqrt{1 - x^2}$

8. Show that $\tan^{-1}(-x) = -\tan^{-1} x$

9. Show that Sin-1 $(-x) = -\text{Sin}^{-1} x$

10. Show that tan (Sin-1) = $x/\sqrt{1 - x^2}$

CHAPTER # 14

1. Trigonometric equation contain …….. trigonometric function.

2. Trigonometric functions are …… function.

3. If Sin x -= Cos x, then the general solution is

   (a) $n\pi$, where $n \varepsilon Z$ (b) $2n\pi$, where $n \varepsilon Z$

   (c) $\pi / 4 + 2n\pi$, where $n \varepsilon Z$ (d) $\pi / 4$

4. Solution of the equation $\text{Sin } x = \sqrt{3} / 2$, $x \varepsilon(0, \pi)$ are

   (a) $\pi / 3, 2\pi / 3$ (b) $\pi / 6, \pi / 3$

   (c) $\pi / 3, 5\pi / 3$ (d) None of these

5. General solution of the equation $1 + \text{Cos } x = 0$ is

   (a) $\{ \pi/2 + 2n\pi\}$ (b) $\{- \pi/2 + 2n\pi\}$

   (c) $\{\pi + 2n\pi\}$ (d) None of these

6. Solution of the equation $1 + \text{Cos } x = 0$ is

   (a) $\pi/2$ (b) π (c) 2π (d) None of these

7. $\text{Cos } x = ½$ has solution:

   (a) $\pi/2$ (b) $\pi/3$ (c) $\pi/4$ (d) $\pi/6$

8. The solution set of $\tan 2x = 1$ in $(0, \pi)$ is:

   (a) $\{\pi/8, 5\pi/8\}$ (b) $\{ \pi/4, 5\pi/4\}$

   (c) $\{ \pi/4, 3\pi/4\}$ (d) None of these

9. The solution set of sec x = - 2 in (0, π) is:

(a) $2\pi/3, 4\pi3$ (b) $\pi/3, 2\pi/3$

(c) $\pi/3, 4\pi/3$ (d) None of these

10. The solution set of sin x = 0 is :

(a) $2n\pi, n \varepsilon Z$ (b) $n \pi, n \varepsilon Z$

(c) $2n\pi, n \varepsilon Q$ (d) None of these

11. The solution of tan2 x = 3, which lie in (o, π) is

(a) $4\pi/3, 5\pi/3$ (b) $\pi/3, 2\pi/3$

(c) $\pi/3, 4\pi/3$ (d) None of these

12. If tan (x/2) = $\sqrt{3}$, and x lies in (0, 2π), then x is equal to

(a) 0 and x (b) $\pi/3$ and $5\pi/3$

(c) $\pi/6$ and $5\pi/6$ (d) None of these

SHORT QUESTION

1. Find the solution of the following equation which lies in $(0, 2\pi)$

   (i) $\text{Sin } x = \sqrt{3} / 2$ (ii) $\text{Sec } x = -2$

2. Solve the following trigonometric equations:

3. $\text{Tan}^2\theta = 1/3$

4. $\text{Csec}^2\theta = 4/3$

5. $\text{Sec}2\ \theta = 4/3$

6. Find the value of θ from the equation

7. $2\ \text{Sin}^2\ \theta = \text{Sin}\ \theta = \theta$

8. $4\ \text{Sin}^2\ \theta - 8\ \text{Cos}\ \theta + 1 = 0$

9. $\text{Sin}\ 2x - \text{Sin}\ x = 0$

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ANSWERS

CHAPTER # 1

1.	b	6.	b	11.	b
2.	c	7.	a	12.	a
3.	d	8.	b	13.	c
4.	c	9.	c	14.	c
5.	c	10.	a		

CHAPTER # 2

1.	c	8.	c	15.	a
2.	c	9.	a	16.	c
3.	d	10.	a	17.	a
4.	a	11.	b	18.	b
5.	b	12.	a	19.	a
6.	c	13.	a	20.	c
7.	a	14.	b		

CHAPTER # 3

1.	d	6.	a	11.	b
2.	c	7.	b	12.	a
3.	d	8.	c	13.	c
4.	a	9.	c		
5.	a	10.	a		

CHAPTER # 4

1. b
2. a
3. b
4. c
5. b
6. a
7. c
8. b
9. d
10. b
11. c
12. c
13. d

CHAPTER # 5

1. d
2. c
3. a
4. b
5. a
6. b
7. b
8. b
9. c
10. a

CHAPTER # 6

1. a
2. b
3. a
4. d
5. c
6. b
7. b
8. b
9. b
10. a
11. c
12. d
13. c
14. a
15. c
16. d
17. c
18. b
19. a
20. d
21. b
22. a
23. c
24. a
25. b
26. a
27. c
28. d

CHAPTER # 7

1. b
2. a
3. a
4. a
5. b
6. c
7. a
8. c
9. b
10. d
11. b
12. c
13. d
14. a
15. a

16. b
17. c
18. a
19. c
20. d
21. c
22. d
23. a
24. d
25. d
26. b
27. a
28. a
29. a
30. d
31. a
32. a
33. b
34. b
35. c

CHAPTER # 8

1. a
2. b
3. d
4. b
5. c
6. d
7. a
8. c
9. a
10. b
11. d
12. d
13. c
14. d
15. c
16. d
17. d
18. c
19. c
20. a

CHAPTER # 9

1. c
2. b
3. d
4. b
5. a
6. c
7. b
8. c
9. a
10. b
11. c
12. d
13. b
14. a
15. c
16. c
17. b
18. a
19. d
20. c
21. c
22. b
23. a
24. c
25. b
26. d
27. a
28. c
29. b
30. b
31. d
32. a
33. a
34. d

CHAPTER # 10

1.	a	10.	b	19.	a
2.	c	11.	c	20.	b
3.	b	12.	b	21.	c
4.	a	13.	a	22.	b
5.	d	14.	d	23.	b
6.	b	15.	b	24.	d
7.	c	16.	a	25.	b
8.	d	17.	d	26.	c
9.	d	18.	c	27.	c

CHAPTER # 11

1.	c	5.	c	9.	a
2.	a	6.	a	10.	b
3.	d	7.	b		
4.	d	8.	a		

CHAPTER # 12

1.	c	11.	a	21.	b
2.	b	12.	c	22.	c
3.	c	13.	b	23.	c
4.	a	14.	b	24.	b
5.	a	15.	c	25.	a
6.	a	16.	a	26.	c
7.	d	17.	a	27.	b
8.	d	18.	b	28.	c
9.	d	19.	a	29.	a
10.	c	20.	d	30.	c

CHAPTER # 13

1.	a	8.	a	15.	b
2.	a	9.	c	16.	c
3.	b	10.	c	17.	b
4.	c	11.	d	18.	b
5.	a	12.	a	19.	b
6.	d	13.	b	20.	a
7.	c	14.	a	21.	b

CHAPTER # 14

1.	a	5.	c	9.	a
2.	c	6.	b	10.	b
3.	c	7.	d	11.	d
4.	a	8.	a	12.	b

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