MATHEMATICS 11th

(OBJECTIVE PART)

It is challenge that you can get 85+ Marks in Annual 2024

Tick (✔) the correct answer.

1. $5.333 \ldots$ is
(a) ✔ Rational (b) Irrational (c) an integer (d) a prime number

2. π is
(a) Rational (b) ✔ Irrational (c) Natural number (d) None

3. Multiplicative inverse of $'0'$ is
(a) 0 (b) any real number (c) ✔ not defined (d) 1

4. 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) $\frac{kb}{b}$

5. The set $\{1, -1\}$ possesses closure property $w.r.t$
(a) $'+'$ (b) ✔ $'\times'$ (c) $'\div'$ (d) $'-'$

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

7. The multiplicative identity of complex number is
(a) (0,0) (b) (0,1) (c) ✔ (1,0) (d) (1,1)

8. 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) ✔ $(\frac{4}{65}, \frac{7}{65})$

9. $(0,3)(0,5) =$
(a) 15 (b) ✔ -15 (c) $-8i$ (d) $8i$

10. $(-1)^{-\frac{21}{2}} =$
(a) i (b) ✔ $-i$ (c) 1 (d) -1

11. Factorization of $3x^2 + 3y^2$ is:
(a) $(3x + 3yi)(3x - 3yi)$ (b) ✔ $3(x + iy)(x - iy)$ (c) $(x - iy)(x + iy)$ (d) None of these

12. The product of any two conjugate complex numbers is
(a) ✔ Real number (b) complex number (c) zero (d) 1

13. Identity element of complex number is
(0,1) (b) (0,1) (c) (0,0) (d) ✔ (1,0)

14. If $z1$ and $z2$ are complex numbers then $|z1+z2|$ is ____.
(a) $<|z_1+z_2|$ (b) ✔ $\leq|z_1|+|z_2|$ (c) $\geq |z_1+z_2|$ (d) None of these

15. The figure representing one or more complex numbers on the complex plane is called:
(a) Cartesian plane (b) Z-Plane (c) Complex plane (d) ✔ Argand diagram

16. $y - axis$ represents
(a) Real numbers (b) ✔ Imaginary numbers (c) natural numbers (d) Rational numbers

17. If $z = x + iy$ then $|z| =$
(a) $x^2 + y^2$ (b) $x^2 - y^2$ (c) ✔ $\sqrt{x^2 + y^2}$ (d) $\sqrt{x^2 - y^2}$

18. $z\bar{z} =$

(a) z^2 (b) z (c) $\bar{z}$ (d) ✔ $|z|^2$

19. $(\boldsymbol{z}-\bar{\boldsymbol{z}})^2$ **is**

(a) Complex number (b) ✔ Real number (c) both (a) and (b) (d) None of these

20. $\boldsymbol{i}^{101} =$

(a) 1 (b) -1 (c) ✔ i (d) $-i$

21. 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) ✔ $\{3,5,7\}$

22. The sets N and O are sets

(a) Equal (b) ✔ Equivalent (c) Not equal (d) None of these

23. Which of the following is true?

(a) $N \subset R \subset Q \subset Z$ (b) $R \subset Z \subset Q \subset N$ (c) $Z \subset N \subset Q \subset R$ (d) ✔ $N \subset Z \subset Q \subset R$

24. The empty set is a subset of

(a) Empty set (b) ✔ Every set (c) Natural set (d) Whole set

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

(a) 1 (b) ✔ 8 (c) 5 (d) 2

26. A set having only one element is called

(a) Empty set (b) ✔ Singleton set (c) Power set (d) Subset

27. The set of odd integers between 2 and 4 is

(a) Null set (b) Power set (c) ✔ Singleton set (d) Subset

28. A diagram which represents a set is called______

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

29. $\boldsymbol{A} \cup \boldsymbol{\varphi} =$

(a) φ (b) U (c) ✔ A (d) $U - A$

30. $\boldsymbol{A} - \boldsymbol{U} =$

(a) ✔ φ (b) A (c) U (d) $U - A$

31. $\boldsymbol{n}(\boldsymbol{AUB}) =$

(a) ✔ $n(A) + n(B)$ (b) $n(A) - n(B)$ (c) $n(B) - n(A)$ (d) $n(A)n(B)$

32. If $A \subseteq B$ then $A \cup B =$

(a) A (b) ✔ B (c) A^c (d) B^c

33. If A and B are disjoint sets then :

(a) ✔ $A \cap B = \varphi$ (b) $A \cap B \neq \varphi$ (c) $A \subset B$ (d) $A - B = \varphi$

34. If $U = N$ then

(a) $E' = E, O' = O$ (b) $E' = U, O' = U$ (c) ✔ $E' = O, O' = E$ (d) None of these

35. If the intersection of two sets is the empty then sets are called

(a) ✔ Disjoint sets (b) Overlapping Sets (c) Subsets (d) Power sets

36. $(\boldsymbol{A} \cup \boldsymbol{B})' =$

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

37. Take any set, say $A = \{1, 2, 3, 4, 5\}$ then $A \cup \emptyset =$

(a) ✔ A (b) $\emptyset$ (c) U (d) None of these

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

(a) ✔ M (b) L (c) φ (d) M'

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

(a) $x \notin L \text{ or } x \notin M$ (b) $x \notin L \text{ or } x \in M$ (c) $x \in L \text{ or } x \notin M$ (d) ✔ $x \in L \text{ or } x \in M$

40. For the propositions p and q , $p \rightarrow (p \vee q)$ is:

(a) ✔Tautology (b) Absurdity (c) Contingency (d) None of these

41. The symbol which is used to denote negation of a proposition is

(a) ✔$\sim$ (b) $\rightarrow$ (c) $\wedge$ (d) $\vee$

42. Truth set of a tautology is

(a) ✔Universal set (b) φ (c) True (d) False

43. A statement which is always falls is called

(a) Tautology (b) ✔ Absurdity (c) Contingency (d) Contra positive

44. $p \rightarrow \sim p$ is

(a) Tautology (b) ✔ Absurdity (c) Contingency (d) Contra positive

45. 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

46. Contra positive of $\sim p \rightarrow \sim q$ is

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

47. The symbol "∃" is called

(a) Universal quantifier (b) ✔ Existential quantifier (c) Converse (d) Inverse

48. The symbol "∀" is called

(a) ✔Universal quantifier (b) Existential quantifier (c) Converse (d) Inverse

49. Truth set of $p \wedge q$ is

(a) ✔$P \cap Q$ (b) $P \cup Q$ (c) $P - Q$ (d) $P + Q$

50. $P = Q$ is the truth set of

(a) $p = q$ (b) $p \rightarrow q$ (c) ✔$p \leftrightarrow q$ (d) $p \Rightarrow q$

51. Truth set of a tautology is the

52. Power set (b) Subset (c) ✔Universal set (d) Super set **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

53. A $(1-1)$ function is also called:

(a) ✔Injective (b) Surjective (c) Bijective (d) Inverse

54. 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

55. Inverse of a line is :

(a) ✔A line (b) a parabola (c) a point (d) not defined

56. The function $f = \{(x, y), y = x\}$ is :

(a) ✔Identity function (b) Null function (c) not a function (d) similar function

57. The range of $\{(2,1), (3,2), (4,3), (5,4), (6,5)\}$

(a) $\{2,3,4,5,6\}$ (b) ✔ $\{1,2,3,4,5\}$ (c) $\{2,1,3,2,4\}$ (d) $\{1,2,3,5\}$

58. $O + E =$

(a) ✔O (b) E (c) W (d) C

59. The set $\{1, -1, i, -i\}$ where $i = \sqrt{-1}$ is closed $w.r.t$

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

60. The set $\{1, \omega, \omega^2\}$ where $i = \sqrt{-1}$ is closed $w.r.t$

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

61. N is closed $w.r.t$

(a) $+$ (b) $\times$ (c) ✔ both (a) and (b) (d) $\div$

62. Inverse and identity of a set S under binary operation $*$ is

63. ✔Unique (b) Two (c) Three (d) Four **The set of natural number is not closed under binary operation**

(a) $+$ (b) $\times$ (c) both (a) and (b) (d) ✔ $-$

64. **The set $\{1,-1,i,-i\}$ is not closed $w.r.t$**

(a) ✔ $+$ (b) $\times$ (c) both (a) and (b) (d) None of these

65. **$(Z,.)$ is**

(a) Group (b) ✔Semi-group (c) closed (d) Not closed

66. **Subtraction is non-commutative and non-associative on**

(a) ✔N (b) R (c) Z (d) Q

67. **A semi-group having an identity is called**

68. Group (b) ✔ monoid (c) Closed (d) Not closed **For every $a,b \in G$, $a*b=b*a$ then G is called**

(a) Group (b) Monoid (c) Closed (d) ✔ Abelian group

69. **In group $(Z,+)$ inverse of 1 is**

(a) 1 (b) ✔ -1 (c) 0 (d) 2

70. **In group $(R-\{0\},\times)$ inverse of 3 is**

(a) ✔$\frac{1}{3}$ (b) -3 (d) 0 (d) 2

71. **In a group the inverse is**

(a) ✔Unique (b) two (d) three (d) four

72. **A rectangular array of numbers enclosed by a square brackets is called:**

(a) ✔Matrix (b) Row (c) Column (d) Determinant

73. **The horizontal lines of numbers in a matrix are called:**

(a) Columns (b) ✔ Rows (c) Column matrix (d) Row matrix

74. **The vertical lines of numbers in a matrix are called:**

(a) ✔Columns (b) Rows (c) Column matrix (d) Row matrix

75. **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

76. **$[1 \quad -1 \quad 3 \quad 4]$ is an example of**

(a) ✔Row vector (b) column vector (c) Rectangular matrix (d) Square matrix

77. **The matrix A is said to be real if its all entries are**

(a) Rational (b) ✔ real (c) natural (d) complex

78. **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

79. **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) proceeding diagonal (d) secondary diagonal

80. **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) Unit matrix (d) Null matrix

81. **A square matrix A is singular if**

(a) ✔$|A|=0$ (b) $|A|\neq 0$ (c) $A=0$ (d) $A\neq 0$

82. **If order of matrix A is $m\times n$ and order of matrix B is $n\times p$ then order of matrix AB is**

(a) $m\times n$ (b) $n\times m$ (c) $n\times p$ (d) ✔ $m\times p$

83. **In general matrix multiplication is not**

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

84. **$(A^t)^t=$**

(a) A^t (b) ✔ A (c) $-A$ (d) $(A^t)^t$

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

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

86. 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) $|A|$

87. 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

88. 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

89. If a square matrix A has two identical rows or two identical columns then

(a) $A = 0$ (b) ✔ $|A| = 0$ (c) $A^t = 0$ (d) $A = 1$

90. If a matrix is in triangular form, then its determinant is product of the entries of its

(a) Lower triangular matrix (b) Upper triangular matrix (c) ✔main diagonal (d) none of these

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

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

92. $\begin{vmatrix} r\cos\varphi & 1 & -\sin\varphi \\ 0 & 1 & 0 \\ r\sin\varphi & 1 & \cos\varphi \end{vmatrix} =$

(a) 1 (b) 2 (c) ✔ r (d) r^2

93. $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix} =$

(a) 1 (b) 2 (c) ✔ 0 (d) -1

94. $(A^{-1})^t =$

95. A^{-1} (b) $(A^{-1})^t$ (c) ✔ $(A^t)^{-1}$ (d) A^t

96. A square matrix A is skew symmetric if:

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

97. A square matrix A is Hermitian if:

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

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

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

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

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

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

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

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

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

102. 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

103. 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

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

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

105. 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

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

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

107. 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

108. $bx + c = 0$ will be quadratic if:

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

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

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

110. 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

111. How many techniques to solve quadratic equations.

(a) 1 (b) 2 (c) ✔ 3 (d) 4

112. The solution of a quadratic equation are called

113. (a) ✔ Roots (b) identity (c) quadratic equation (d) solution **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) $y = \frac{1}{x}$

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

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

115. 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) $y = 4^{-x}$

116. The equation $x^4 - 3x^3 + 4x^2 - 3x + 1 = 0$ is example of

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

117. 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) $-1, \frac{1+\sqrt{3}i}{2}, \frac{1+\sqrt{3}i}{2}$

118. Sum of all cube roots of 64 is :

(a) ✔ 0 (b) 1 (c) 64 (d) -64

119. Product of cube roots of -1 is:

(a) 0 (b) -1 (c) ✔ 1 (d) None

120. $16\omega^8 + 16w^4 =$

(a) 0 (b) ✔ -16 (c) 16 (d) -1

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

(a) Unity (b) ✔ 0 (c) -1 (d) None

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

(a) Unity (b) 0 (c) ✔ -1 (d) None

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

(a) 16 (b) -16 (c) ✔ 0 (d) 1

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

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

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

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

126. The cube roots of -1 are

127. (a) $\{1, \omega, \omega^2\}$ (b) $\{1, -\omega, \omega^2\}$ (c) ✔ $\{-1, -\omega, -\omega^2\}$ (d) $\{-1, \omega, \omega^2\}$

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

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

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

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

129. **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) $x - a = R$

130. **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) $x = -a$

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

(a) 2 (b) ✔ 4 (c) 8 (d) -4

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

(a) 2 (b) -2 (c) 1 (d) ✔ -1

133. **$x + a$ 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

134. **$x - a$ is a factor of $x^n - a^n$ when n is**

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

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) ✔ $-\frac{c}{a}$

135. **Product 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) $-\frac{c}{a}$

136. **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) $x^2 + 3x + 10 = 0$

137. **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) $-\frac{4}{3}$

138. **The equation whose roots are given is**

139. $x^2 + Sx + P = 0$ (b) $x^2 - Sx - P = 0$ (c) $x^2 + Sx - P = 0$ (d) ✔ $x^2 - Sx + P = 0$

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

140. **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

141. **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

142. **The expression $b^2 - 4ac$ is called:**

(a) ✔ Discriminant (b) Quadratic equation (c) Linear equation (d) roots

143. **Disc of $x^2 + 2x + 3 = 0$ *is***

(a) 16 (b) -16 (c) ✔ -8 (d) -16

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

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

145. **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

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

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

147. **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

148. **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 $Q(x)$

149. **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 $Q(x)$

150. 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

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

(a) 2 (b) 3 (c) 4 (d) ✔ 5

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

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

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

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

154. A *sequence* is also known as:

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

155. A sequence is function whose *domain* is

(a) Z (b) ✔ N (c) Q (d) R

156. 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

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

(a) 10 (b) 11 (c) 12 (d) 13

157. The last term of an infinite *sequence* is called :

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

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

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

159. For $a_n = (-1)^{n+1}$, $a_{26} =$

(a) 1 (b) ✔ -1 (c) 0 (d) 2

160. The next two terms of the *sequence* $1, -3, 5, -7, 9, -11, \ldots$ are

(a) 13,15 (b) $-13, -15$ (c) ✔ $13, -15$ (d) $-13,15$

161. For $a_n = \frac{1}{2^n}$, $a_1 =$

(a) 2 (b) ✔ $\frac{1}{2}$ (c) 4 (d) 8

162. 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

163. nth term of an A.P is $3n - 1$ then 10th term is :

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

1. For $a_n - a_{n-1} = d$

(a) $n = 0$ (b) $n = 1$ (c) ✔ $n > 1$ (d) $n < 1$

164. 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

165. Arithmetic mean *between* c and d is:

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

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

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

167. $\frac{a^n+b^n}{a^{n-1}+b^{n-1}}$ may be the A.M between a and b if

(a) ✔ $n = 1$ (b) $n = 0$ (c) $n > 1$ (d) $n < 1$

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

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

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

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

170. 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) $\frac{n}{2}[2a+\;]$

171. 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) $a_{n+1}-a_n, n\in N, n>1$

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

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

173. 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

174. *Geometric* mean between 4 and 16 is

(a) ± 2 (b) ± 4 (c) ± 6 (d) ✔ ± 8

175. For *what* value of n, $\frac{a^n+b^n}{a^{n-1}+b^{n-1}}$ is the positive geometric mean between a and b?

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

176. The *sum* of infinite geometric series is valid if

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

177. 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

178. An *infinite* geometric series is convergent if

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

179. An *infinite* geometric series is divergent if

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

180. If sum *of* series is defined then it is called:

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

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

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

182. *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) $|x|<1$

183. 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

184. *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) $\frac{1}{3n+1}$

185. *Harmonic* mean between 2 and 8 is:

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

186. 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

187. 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

188. , then S_{2n} is equal to:

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

189. $\sum_{k=1}^{n} k^3 =$

(a) $\frac{n(n+1)}{2}$ (b) $\frac{n(n+1)(n+2)}{6}$ (c) ✔ $\frac{n^2(n+1)^2}{4}$ (d) $\frac{n(n+1)^2}{2}$

190. $\sum_{k=1}^{n} 1 =$

(a) 1 (b) 0 (c) k (d) ✔ n

191. $\frac{8!}{7!} =$

(a) ✔8 (b) 7 (c) 56 (d) $\frac{8}{7}$

192. $0! =$

(a) 0 (b) ✔ 1 (c) 2 (d) cannot be defined

193. $n! =$

(a) $n(n-1)$ (b) $(n-1)!$ (c) $(n-2)!$ (d) ✔ $n(n-1)!$

194. $\frac{9!}{6!3!} =$

(a) 80 (b) ✔ 84 (c) 90 (d) 94

195. **Factorial form of $\frac{8.7.6}{3.2.1}$ is**

(a) $\frac{8!}{3!4!}$ (b) $\frac{8!}{3!3!}$ (c) ✔ $\frac{8!}{3!5!}$ (d) $\frac{8!}{3!6!}$

196. $20_{P_3} =$

(a) 6890 (b) 6810 (c) ✔ 6840 (d) 6880

197. **If $n_{P_2} = 30$ then $n =$**

(a) 4 (b) 5 (c) 6 (d) 10

198. $n_{P_n} =$

(a) n (b) $p!$ (c) ✔ $n!$ (d) $(n-1)!$

199. $n_{P_r} =$

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

200. **___________ of n different objects is called permutation.**

(a) Combination (b) ✔ Permutation (c) Probability (d) Arrangements

201. **In haw many ways the letters of the "$WORD$" can be write?**

(a) 2! ways (b) 3! ways (c) ✔ 4! ways (d) 5! ways

202. **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

203. $n_{C_n} =$

(a) $n!$ (b) 0! (c) ✔ 1 (d) 0

204. $n_{C_r} \times r! =$

(a) n_{C_r} (b) ✔ n_{P_r} (c) n_{C_n} (d) $r!$

205. $n_{C_0} =$

(a) 0 (b) ✔ 1 (c) 2 (d) n

206. **For complementary combination $n_{C_r} =$**

(a) n_{C_n} (b) ✔ $n_{C_{n-r}}$ (c) n_{C_r} (d) None of these

207. **If $n_{C_8} = n_{C_{12}}$ then $n =$**

(a) 10 (b) ✔ 20 (c) 30 (d) 40

208. **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) $n < 0, r < 0$

209. **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) $1 + P(E)$

210. **Non occurrence of an event E is denoted by:**

(a) $\sim E$ (b) ✔ $\overline{E}$ (c) E^c (d) All of these

211. **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) $\frac{17}{13}$

212. Four persons wants to sit in a circular sofa, the total ways are:

(a) ✔24 (b) 6 (c) 4 (d) None of these

213. 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) $\frac{1}{2}$

214. 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) $\frac{1}{36}$

215. If E is a certain event , then

(a) $P(E)=0$ (b) ✔ $P(E)=1$ (c) $0<P(E)<1$ (d) $P(E)>1$

216. If E is an impossible event ,then

(a) ✔$P(E)=0$ (b) $P(E)=1$ (c) $P(E)\neq 0$ (d) $0<P(E)<1$

217. Sample space for tossing a coin is:

(a) $\{H\}$ (b) $\{T\}$ (c) $\{H,H\}$ (d) ✔ $\{H,T\}$

218. For independent events $P(A\cup B)=$

(a) $P(A)+P(B)$ (b) ✔ $P(A)+P(B)-P(A\cap B)$ (c) $P(A).P(B)$ (d) $\frac{P(A)}{P(B)}$

219. If $P(A)=\frac{1}{2}$, $P(B)=\frac{1}{2}$ and $P(A\cap B)=\frac{1}{3}$ then $=P(A\cup B)=$

(a) $\frac{1}{2}$ (b) ✔ $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) $\frac{1}{4}$

220. 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) $(p+q)!$

221. If $P(A)=0.8$ and $P(B)=0.75$ then $P(A\cap B)=$

(a) 0.5 (b) ✔ 0.6 (c) 0.7 (d) 0.9

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

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

223. The method of induction was given by Francesco who lived from:

(a) ✔1494-1575 (b) 1500-1575 (c) 1498-1575 (d) 1494-1570

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

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

225. 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) $\binom{n}{r}a^{n-r}x^r$

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

(a) n (b) ✔ $n+1$ (c) 2^n (d) 2^{n-1}

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

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

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

(a) 1 (b) ✔ -1 (c) 7 (d) -7

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

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

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

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

230. 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

231. The common starting point of two rays is called:

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

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

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

233. One right angle is equal to

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

234. 1° is equal to

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

235. 1° is equal to

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

236. 60th part of 1° is equal to

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

237. 3 radian is

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

238. 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) $\frac{1}{2r^2\theta}$

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

240. $\frac{\pi}{6}$ (b) ✔ $\frac{2\pi}{3}$ (c) $\frac{3\pi}{2}$ (d) $\frac{\pi}{3}$ **An angle is in standard position , if its vertex is**

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

241. 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

242. $0°, 90°, 180°, 270°$ and $360°$ are called

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

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

(a) 0 (b) -1 (c) 2 (d) ✔ 1

244. $1 + tan^2\theta$ is equal to:

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

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

(a) 0 (b) ✔ 1 (c) -1 (d) 2

(a) I (b) II (c) III (d) IV

246. 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

247. 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

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

(a) 0° (b) ✔ 90° (c) 180° (d) 270°

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

(a) 0° (b) 90° (c) ✔ 180° (d) 270°

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

(a) 0° (b) 90° (c) 180° (d) ✔ 270°

251. $2Sin45° + \frac{1}{2}Cosec45° =$

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

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

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

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

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

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

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

255. **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) $sin\alpha cos\beta - cos\alpha sin\beta$

256. $sin(\alpha + \beta)$ **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) $sin\alpha cos\beta - cos\alpha sin\beta$

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

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

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

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

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

(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) $\frac{tan\alpha + tan\beta}{1-tan\alpha tan\beta}$

260. ***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

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

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

262. $cos\ 315°$ **is equal to:**

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

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

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

264. **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) $-\cos\frac{\gamma}{2}$

265. **Which is the allied angle**

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

266. **1.** $\frac{cos11° + sin11°}{cos11° - sin11°} =$

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

267. **2. If** $Sin(\alpha + \beta)$ **is** $-ive$ **and** $Cos(\alpha + \beta)$ **is** $+ive$ **then terminal arm of** $(\alpha + \beta)$ **lies in**

268. I Quad (b) II Quad (c) III Quad (d) ✔ IV Quad

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

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

270. $cos2\alpha =$

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

271. $tan2\alpha =$

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

272. $sin3\alpha =$

(a) $3sin\alpha - 2\sin^3\alpha$ (b) $3sin\alpha + 2\sin^3\alpha$ (c) ✔ $3sin\alpha - 4\sin^3\alpha$ (d) $3cos\alpha - 2\sin^3\alpha$

273. $sin\alpha + sin\beta$ **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) $2\cos\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$

274. $\boldsymbol{sin\alpha - sin\beta}$ **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) $2\cos\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$

275. $\boldsymbol{cos\alpha + cos\beta}$ **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) ✔ $2\cos\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$

276. $\boldsymbol{cos\alpha - cos\beta}$ **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) $2\cos\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$

277. $\boldsymbol{2sin7\theta cos3\theta =}$

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

278. $\boldsymbol{2cos5\theta sin3\theta =}$

279. ✔ $sin8\theta - sin2\theta$ (b) $sin8\theta + sin2\theta$ (c) $cos8\theta + cos2\theta$ (d) $cos8\theta - \boldsymbol{cos2\theta}$**Range of** $\boldsymbol{y = secx}$ **is**

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

280. Range of $\boldsymbol{y = cosecx}$ **is**

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

281. ***Smallest*** $\boldsymbol{+ive}$ **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

282. ***Domain*** **of** $\boldsymbol{y = cosx}$ **is**

(a) ✔$-\infty < x < \infty$ (b) $-1 \leq x \leq 1$ (c) $-\infty < x < \infty, x \neq n\pi, n \in Z$ (d) $x \geq 1, x \leq -1$

283. Domain of $\boldsymbol{y = tanx}$ **is**

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

284. Period of $\boldsymbol{cos\theta}$ **is**

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

285. Period of $\boldsymbol{tan4x}$ **is**

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

286. Period of $\boldsymbol{cot3x}$ **is**

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

287. Period of $\boldsymbol{3cos\frac{x}{5}}$ **is**

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

288. The ***graph*** **of trigonometric functions have:**

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

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

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

290. The ***graph*** **of** $\boldsymbol{y = cosx}$ **lies between the horizontal line** $\boldsymbol{y = -1}$ **and**

(a) ✔ +1 (b) 0 (c) 2 (d) -2

291. A "*Triangle*" has :

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

292. $\boldsymbol{sin38°24' =}$

(a) 0.2611 (b) 0.2622 (c) 0.6211 (d) 0.5211

293. When θ *increases* from 0° to 90° then $sin\theta, sec\theta$ and $tan\theta$ go on

(a) ✔Increasing (b) Decreasing (c) Constant (d) None of these

294. When θ *increases* from 0° to 90° then $cos\theta, cosec\theta$ and $cot\theta$ go on

(a) Increasing (b) ✔Decreasing (c) Constant (d) None of these

295. If $sinx = 0.5100$ *then* $x =$

(a) ✔$30°40'$ (b) $35°40'$ (c) $40°40'$ (d) $44°44'$

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

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

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

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

298. A triangle which is *not* right is called:

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

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

300. $\frac{a-b}{a+b} = \frac{\tan(\alpha-\beta)}{\tan(\alpha+\beta)}$ (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) $\frac{a-b}{a+b} = \frac{\tan\frac{\alpha+\beta}{2}}{\tan\frac{\alpha-\beta}{2}}$

301. 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) $\cos\frac{\alpha}{2}$

302. 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) $\cos\frac{\alpha}{2}$

303. 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) $\cos\frac{\alpha}{2}$

304. 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) $\sqrt{\frac{s(s-c)}{ab}}$

305. 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) $\sqrt{\frac{s(s-c)}{ab}}$

306. 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)✔ $\sqrt{\frac{s(s-c)}{ab}}$

307. 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) $\frac{abc}{2}$

308. 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) $\cot\frac{\gamma}{2}$

309. 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) $\cot\frac{\gamma}{2}$

310. 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

311. 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)✔ $\frac{1}{2}absin\gamma$

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

(a) r (b) r_1 (c)✔ R (d) Δ

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

(a) $2r$ (b) $2r_1$ (c) ✔ $2R$ (d) 2Δ

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

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

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

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

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

(a) r (b) R (c) ✔ r_1 (d) r_2

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

(a) r (b) R (c) r_1 (d) ✔ r_2

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

(a) ✔r_3 (b) R (c) r_1 (d) r_2

319. 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

320. 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

321. In a triangle ABC, if $\beta = 60°$, $\gamma = 15°$ then $\alpha =$

(a) $90°$ (b) $180°$ (c) $150°$ (d) ✔$105°$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

330. 4. $Tan^{-1}A + Tan^{-1}B =$

(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) $Tan^{-1}\left(\frac{A+B}{1+AB}\right)$

331. $Cos^{-1}(-x) =$

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

332. $Tan^{-1}(-x) =$

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

333. $Cosec^{-1}(-x) =$

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

334. $Cot^{-1}(-x) =$

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

335. If $\tan 2x = -1$, then solution in the interval $[0, \pi]$ is:

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

336. If $sinx + cosx = 0$ then value of $x \in [0, 2\pi]$

(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) $\{\frac{\pi}{4}, \frac{-\pi}{4}\}$

337. General solution of $4sinx - 8 = 0$ is:

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

338. General solution of $1 + cosx = 0$ is:

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

1. 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

339. General solution of every trigonometric equation consists of :

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

340. 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) $\frac{11\pi}{6}$

341. 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) $\{\frac{\pi}{4} + n\pi, \frac{5\pi}{4} + n\pi\}$

342. 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

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

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

SHORT QUESTIONS SEC (A)

1)	Which of the following have closure property w.r.t addition and multiplication $\{0, -1\}$
2)	Prove that $-\frac{7}{12} - \frac{5}{18} = \frac{-21-10}{36}$
3)	Write reflexive property of equality of real number.
4)	Simplify by justifying each step. $\frac{\frac{1}{4}+\frac{1}{5}}{\frac{1}{4}-\frac{1}{5}}$
5)	Prove the rules of addition. $\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$
6)	Prove the rules of addition. $\frac{a}{b} + \frac{c}{d} = \frac{ad+bc}{bd}$
7)	Prove that $-\frac{7}{12} - \frac{5}{18} = \frac{-21-10}{36}$
8)	Find the sum, difference and product of the complex numbers $(8,9)$ and $(5,-6)$
9)	Simplify: $(-1)^{\frac{-21}{2}}$
10)	Simplify $(2,6)(3,7)$
11)	Simplify $(2,6) \div (3,7)$ Hint: $\frac{(2,6)}{(3,7)} = \frac{2+6i}{3+7i} \times \frac{3-7i}{3-7i}$ etc.
12)	Simplify $(5,-4) \div (-3,-8)$
13)	Find the multiplicative inverse of the numbers: $(-4,7)$
14)	Find the multiplicative inverse of the numbers: $(\sqrt{2}, -\sqrt{5})$