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(*Encircle the correct answer choice*)

1. For any complex number z, it is always true that $|z|$ is equal to
   (a) $|\bar{z}|$ (b) $|-z|$ (c) $|-\bar{z}|$ (d) all of these
2. If z_1 and z_2 are any two complex number, then
   (a) $|z_1+z_2| < |z_1| + |z_2|$ (b) $|z_1+z_2| \le |z_1| + |z_2|$
   (c) $|z_1-z_2| < |z_1| - |z_2|$ (d) $|z_1+z_2| \ge |z_1| + |z_2|$
3. If z_1 and z_2 are two complex number then
   (a) $\overline{z_1+z_2} = \bar{z}_1 + \bar{z}_2$ (b) $\overline{z_1 z_2} = \bar{z}_1 \bar{z}_2$
   (c) $|z_1 z_2| = |z_1||z_2|$ (d) all of these
4. The numbers which can be put in the form of $\frac{p}{q}$ $p, q \in Z, q \neq 0$ are
   (a) Rational numbers (b) Irrational numbers
   (c) Natural numbers (d) Integers
5. The numbers which cannot be written in the form of $\frac{p}{q}$ $p, q \in Z$, $q \neq 0$ are
   (a) Rational numbers (b) Irrational numbers
   (c) Complex numbers (d) Whole numbers
6. A decimal which has only a finite numbers of digits in its decimal part is called.
   (a) Terminating decimal (b) Non- terminating decimal
   (c) Recurring decimal (d) Non recurring
7. A decimal in which one or more digits repeat indefinitely in its decimal part is called
   (a) Terminating decimal (b) Periodic decimal
   (c) Infinite set (d) Repeated number
8. Every recurring decimal is
   (a) a rational number (b) an Irrational number
   (c) a prime integer (d) a whole number
9. A non terminating and a non recurring decimal is
   (a) a rational number (b) an Irrational number
   (c) Periodic number (d) a sequence
10. 5.333……is
    (a) Rational (b) Irrational (c) an Integer (d) a prime integer
11. π is
    (a) Rational (b) Irrational (c) Natural number (d) None
12. $\frac{22}{7}$ is
    (a) Rational (b) Irrational (c) an Integ r (d) a whole nun

13. π is the ratio

(a) $\dfrac{\text{circumference of circle}}{\text{length of diameter}}$ (b) $\dfrac{\text{circumference of circle}}{\text{length of Radius}}$

(c) $\dfrac{\text{length of diameter}}{\text{circumference of circle}}$ (d) $\dfrac{\text{length of Radius}}{\text{circumference of circle}}$

14. Every Integer is also a
(a) a rational number (b) an Irrational number
(c) a Natural number (d) a decimal number

15. If n is a prime number, then $\sqrt{n}$ is
(a) a rational number (b) an Irrational number
(c) an Integer (d) periodic number

16. If n is a negative number, then $\sqrt{n}$ is
(a) a rational number (b)an Irrational number
(c) only negative integer (d) a pure Imaginary

17. The number '0' is
(a)a rational number (b) an integer
(c) Even number (d) all of these

18. The number '0' is
(a) a non positive integer (b) a non negative integer
(c) Real number (d) whole number (e) all of these

19. If $a, b \in$ R and $(a + b) \in$ R then this property of real numbers is
(a) Closure property w. r. t. + (b)Commutative property w. r. t +
(c) Associative property w. r. t + (d) Additive property

20. For $a, b \in R$ if $a + b = b + a$, then this property is called
(a) Closure property w. r. t + (b) commutative property w. r. t +
(c) Associative property w. r. t + (d) Distributive property

21. Multiplicative Inverse of 0 is
(a) 0 (b) Any real number (c) Not defined (d) 1

22. If a is any non-zero real number, then its multiplicative inverse is
(a) $-a$ (b) $\dfrac{1}{a}$ (c) $-\dfrac{1}{a}$ (d) Not defined

23. For all $a \in$ R, $a = a$ is ... ... property
(a) Reflexive (b) Symmetric (c) Transitive (d) Trichotomy

24. For all $a, b \in$ R, $a = b \Rightarrow b = a$ is called .... Property
(a)Reflexive (b) Transitive (c) symmetric (d) Trichotomy

25. For $a, b, c \in$ R if $a = b, b = c \Rightarrow a = c$, then it is ... ... property
(a)Transitive (b) Trichotomy (c) cancellation (d) symmetric

26. For $a, b, c \in R$ $a = b \Rightarrow a + c = b + c$, then it is ..... property
(a) Transitive (b) Trichotomy (c) cancellation (d) Additive

27. For $a, b, c \in R$ $a + c = b + c \Rightarrow a = b$, then it is .... Property
(a) Transitive (b) Trichotomy (c) cancellation (d) Additive

28. For $a, b, c \in R$ $a = b \Rightarrow ac = bc$, then it is ....property
(a)Commutative (b)Closure (c)Transitive (d)Multiplicative

29. For $a, b, c \in R$ and $a > b, b > c \Rightarrow a > c$, then it is ... .. property
(a)Transitive (b)Trichotomy (c) Cancellation (d) Inverse

30. For $a, b\ c \in R$,if $a < b$ and $c > 0$, then which is true
(a) $a + c > b + c$ (b) $ac > bc$ (c) $ac < bc$ (d) $a - b > 0$

31. For $a, b\ c \in R$ if $a > b$ and $c < 0$, then
(a) $a + c < b + c$ (b) $ac > bc$ (c) $ac < bc$ (d) $a - b < 0$

32. If $a > 0$ and $b < 0$,then
(a) $ab > 0$ (b) $ab < 0$ (c) $a + b \geq 0$ (d) $a - b < 0$

33. The set $\{1, -1\}$ is closed w. r. t
(a) Addition (b) Multiplication (c) Subtraction (d) None

34. The set $\{1\}$ has closure property w. r. t
(a) Addition (b) Subtraction (c) Division (d) None

35. $a(b + c - d) = ab + ac - ad$ is ------ property
(a)Left distributive (b)Right distributive (c)Associative (d)none.

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

37. If $\frac{a}{b} = \frac{ka}{kb}$, $k \neq 0$, this rule is called
(a) Rules of product of fractions (b) Golden rule of fraction
(c)Rules of Quotient of fractions (d)principle for equality of fraction

38. If n is an even Integer, then $(i)^n$ is equal to
(a) i (b) $-i$ (c) ± 1 (d) $\pm i$

39. If n is an odd number then $(i)^n$ is equal to
(a) i (b) $-i$ (c) ± 1 (d) $\pm i$

40. If n is an integral multiple of 4, then $(i)^n$ is equal to
(a) 1 (b) -1 (c) ± 1 (d) $\pm i$

41. If $a + ib = c + id$, then it must be true that
(a) $a = c$ & $b = d$ (b) $a = -c$ & $b = d$
(c) $a = d$ & $b = c$ (d) $ad = bc$

42. If $a + ib$ is complex number ,then its conjugate is
(a) $a - ib$ (b) $-a - ib$ (c) $\sqrt{a^2 + b^2}$ (d) ab

43. If z is any real number, then its conjugate is
(a) a real number (b)complex number (c) any Integer (d) zero

44. If k is any real number and $a + ib$ is a complex number, then
(a) $|k(a + ib)| = ka + ib$ (b) $|k(a + ib)| = ka - ikb$
(c) $|k(a + ib)| = \sqrt{k^2(a^2 + b^2)}$ (d) None of these

45. The additive identity in set of complex numbers is
(a) (0, 0) (b) (0, 1) (c) (1, 0) (d) (1, 1)

46. The multiplicative Identity of complex numbers is
(a) (0, 0) (b) (0, 1) (c) (1, 0) (d) (1, 1)
47. The additive Inverse of $(a, -b)$ is
(a) (a, b) (b) $(a, -b)$ (c) $(-a, -b)$ (d) $(-a, b)$
48. The multiplicative Inverse of $(a, -b)$ is
(a) $\left(\frac{a}{a^2+b^2}, \frac{b}{a^2+b^2}\right)$ (b) $\left(\frac{a}{a^2+b^2}, \frac{-b}{a^2+b^2}\right)$
(c) $\left(\frac{-a}{a^2+b^2}, \frac{b}{a^2+b^2}\right)$ (d) $\left(\frac{a}{\sqrt{a^2+b^2}}, \frac{-b}{\sqrt{a^2+b^2}}\right)$
49. (0, 1) is equal to
(a) 1 (b) i (c) $-i$ (d) 0
50. $(0, 1)^2$ is equal to
(a) 1 (b) -1 (c) i (d) $-i$
51. $(0, 1)^3$ is equal to
(a) 1 (b) -1 (c) i (d) $-i$
52. $(0, 1)^4$ is equal to
(a) 1 (b) -1 (c) i (d) $-i$
53. $(-i)^{19}$ is equal to
(a) i (b) $-i$ (c) 1 (d) -1
54. $(-1)^{\frac{-21}{2}}$ is equal to
(a) i (b) $-i$ (c) 1 (d) -1
55. (0, 3) (0, 5) is equal to
(a) 15 (b) -15 (c) $-8i$ (d) $8i$
56. The sum of two conjugate complex numbers is
(a) a real number (b) an imaginary number
(c) real or imaginary number (d) not defined
57. The product of two conjugate complex numbers is
(a) a real number (b) an imaginary number
(c) May be an Irrational number (d) not defined
58. The multiplicative Inverse of $(-4, 7)$ is
(a) $\left(\frac{-4}{65}, \frac{-7}{65}\right)$ (b) $\left(\frac{4}{65}, \frac{-7}{65}\right)$ (c) $\left(\frac{-4}{\sqrt{65}}, \frac{-7}{\sqrt{65}}\right)$ (d) $\left(\frac{4}{\sqrt{65}}, \frac{-7}{\sqrt{65}}\right)$
59. Factors of $3(x^2+y^2)$ are
(a) $3(x+y)(x-y)$ (b) $3(x+iy)(x-iy)$
(c) $\sqrt{3}(x+iy)(x-iy)$ (d) none
60. Real part of $\frac{2+i}{i}$ is equal to
(a) 1 (b) 2 (c) -1 (d) $\frac{1}{2}$
61. Imaginary part of $(-2+3i)^3$ is equal to
(a) -2 (b) 9 (c) 26 (d) -8

62. If R is the set of real numbers, then product R x R is called
(a) Cartesian plane (b) Argand diagram
(c) Ordered pair (d) real line

63. The geometrical plane on which coordinate system has been specified is called
(a) Coordinate plane or real plane (b) Argand diagram
(c)Cartesian plane (d) Real line

64. If a point A of a coordinate plane corresponds to the ordered pair (a, b), then a and b are called.
(a) Coordinates of point A (b) Value of point A
(c)Abscissa of point A (d) ordinates of point A

65. If point A of the coordinate plane corresponds to the ordered pair (a, b) then,
(a) a is abscissa of point A (b) b is ordinate of point A
(c) a & b are coordinates of point A (d) all of these

66. The modulus value of a complex number $z = x + iy$ is the distance form
(a) x- axis (b) y- axis (c) origin (d) (x, y)

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

68. If $z_1 = 2 + 3i$, $z_2 = 1 - i$ then $|z_1 z_2| =$
(a) $\sqrt{13}$ (b) $\sqrt{26}$ (c) $\sqrt{15}$ (d) 26

69. The correct statement of De Mover's Theorem is $(\cos\theta + i\sin\theta)^n$ is equal to
(a) $(\cos\theta + i\sin\theta)^{n+1}$ (b) $(\cos n\theta + i\sin n\theta)$
(c) $(n\cos\theta + i\,n\sin\theta)$ (d) $(\cos n\theta - i\sin n\theta)$

70. Polar form of $1 + i\sqrt{3}$ is
(a) $2(\cos 60^\circ + i\sin 60^\circ)$ (b) $2(\cos 60^\circ - i\sin 60^\circ)$
(c) $2(\cos 30^\circ + i\sin 30^\circ)$ (d) $\cos 60^\circ + i\sin 60^\circ$

71. Real part of $(x + iy)^n$ is
(a) $\cos n\theta$ (b) $\sin n\theta$
(c) $r^n\cos n\theta$ (d) $r^n\sin n\theta$

72. Polar form of $(\sqrt{3} + i)$ is
(a) $2(\cos\frac{\pi}{6} + i\sin\frac{\pi}{6})$ (b) $2(\cos\frac{\pi}{6} - i\sin\frac{\pi}{6})$
(c) $2(\cos\frac{\pi}{3} + i\sin\frac{\pi}{3})$ (d) $2(\cos\frac{\pi}{3} - i\sin\frac{\pi}{3})$

73. If z is a real number, then
(a) $\bar{z} = z$ (b) $\bar{z} = |z|$ (c) $z\bar{z} = |z|$ (d) $\bar{z} = -z$

74. If $\bar{z} = 3 - 5i$, then $|z|^2$ is equal to
(a) 34 (b) $\sqrt{34}$ (c) 16 (d) none

75. If $z = a + ib$, then $(z-\bar{z})^2$ is equal to
(a) $2a$ (b) $4a$ (c) $-4b^2$ (d) $4a^2$

76. If $Z = a + ib$, then $(Z^2 + \bar{Z}^2)$ is equal to
(a) $2(a^2 + b^2)$ (b) $2(a^2 - b^2)$ (c) $4\,iab$ (d) $(a^2 + b^2)^2$

77. If $z = x + iy$, then argument of z is.
(a) $\theta = \tan^{-1}\left(\frac{x}{y}\right)$ (b) $\theta = \tan^{-1}\left(\frac{y}{x}\right)$
(c) $\theta = -\tan^{-1}(xy)$ (d) $\theta = -\tan^{-1}\left(\frac{y}{x}\right)$

78. If $|\,x + 5i\,| = 3$, then x is equal to
(a) ± 4 (b) $\pm 4i$ (c) $\pm 22i$ (d) none of these

79. Golden rule of fraction is that for $k \neq 0$ $\frac{a}{b} =$
(a) $\frac{ka}{kb}$ (b) $\frac{ab}{k}$ (c) $\frac{kb}{ka}$ (d) $\frac{kb}{b}$

80. The set $\{1, -1\}$ possesses closure property w.r.t.
(a) addition (b) multiplication (c) division (d) subtraction

81. $(-1)^{9/2}$ equals:
(a) 1 (b) -1 (c) i (d) $-i$

82. The modulus of $\bar{\bar{Z}}$ is:
(a) $\sqrt{a^2 - b^2}$ (b) $a^2 + b^2$ (c) $\sqrt{a^2 + b^2}$ (d) $\sqrt{a^2 - (ib)^2}$

83. 0.142857142857l......... is:
(a) irrational number (b) rational number
(c) natural number (d) decimal number

84. i^{13} equals:
(a) i (b) 1 (c) -1 (d) $-i$

Chapter - 2 Multiple Choice Questions

(Encircle the correct answer choice)

1. If $A \subseteq B$ and $B \subseteq A$ then which is true
(a) $A = B$ (b) $A \neq B$ (c) $A \cap B = \phi$ (d) $A \cup B = \phi$

2. If $(1 - 1)$ correspondence can be established in two sets A and B, then it must be true that
(a) $A = B$ (b) $A \sim B$ (c) $A \cap B = \phi$ (d) $A \cap B \neq \phi$

3. The set N of natural numbers and O of odd number are
(a) $N \sim O$ (b) $N \cap O = \phi$ (c) $N \cup O = O$ (d) none of these

4. The set N and Z are
   (a) Equivalent sets (b) Equal sets
   (c) Disjoint sets (d) finite sets
5. Which of the following is true
   (a) $N \subset Z$ (b) $Z \subset Q$ (c) $Q \subset R$ (d) all of these
6. If a set S has m elements, then number of subsets in S are
   (a) m^2 (b) 2^m (c) $2^{m \times m}$ (d) m
7. If $A \subseteq B$, then
   (a) B is super set of A (b) $A \cap B = \phi$
   (c) $B - A = A - B$ (d) $A \cap B \neq \phi$
8. If a set S has no proper subset, and then S will be
   (a) a singleton set (b) empty set
   (c) an infinite set (c) not a set
9. If a set S has one proper subset only, then S will be
   (a) a singleton set (b) empty set
   (c) an infinite set (c) not a set
10. If a set S has n elements, then number of elements in P (S) =
   (a) n^2 (b) 2^n (c) $2^{n \times n}$ (d) n
11. The set of all subsets of a set is called
   (a) Power set (b) Subset
   (c) Super set (d) Infinite set
12. If S = { }, then order of set S is
   (a) 0 (b) 1 (c) Infinite set (d) not defined
13. The Power set of an empty set has
   (a) No elements (b) One element
   (c) Infinity many elements (d) Two elements
14. If n (S) = m , then n (P(S) is equal to
   (a) m^2 (b) 2^m (c) $2^{m \times m}$ (d) m
15. The set of all elements under consideration is called
   (a) Universe of discourse (b) Universe
   (c) an infinite set (d) Finite set
16. The set of real numbers between 1 and 3 is
   (a) Infinite set (b) {2} (c) finite set (c) a group
17. Tabular form of $\{x \mid x \in Q, x = -x\}$ is
   (a) { 0 } (b) { } (c) all Rational (d) { 2 }
18. Which of the following is true
   (a) $a \in \{\{a\}\}$ (b) $\phi \in \{a\}$
   (c) $\phi \subseteq \{\{a\}\}$ (d) $\phi \in \{\{\phi\}\}$
19. The set builder form of $A \cup B$ is equal to
   (a) $\{x \mid x \in A \wedge x \in B\}$ (b) $\{x \mid x \in A \vee x \in B\}$
   (c) $\{x \mid x \in A \wedge x \notin B\}$ (d) $\{x \mid x \in B \wedge x \notin A\}$

20. The set builder form of $A \cap B$ is equal to
(a) $\{x \mid x \in A \wedge x \in B\}$ (b) $\{x \mid x \in A \vee x \in B\}$
(c) $\{x \mid x \in A \wedge x \notin B\}$ (d) $\{x \mid x \in B \wedge x \notin A\}$

21. The set builder form of $A - B$ is equal to
(a) $\{x \mid x \in A \wedge x \in B\}$ (b) $\{x \mid x \in A \vee x \in B\}$
(c) $\{x \mid x \in A \wedge x \notin B\}$ (d) $\{x \mid x \in B \wedge x \notin A\}$

22. The set builder form of $B - A$ is equal to
(a) $\{x \mid x \in A \wedge x \in B\}$ (b) $\{x \mid x \in A \vee x \in B\}$
(c) $\{x \mid x \in A \wedge x \notin B\}$ (d) $\{x \mid x \in B \wedge x \notin A\}$

23. If $A \cap B = \phi$, then A and B are
(a) Disjoint sets (b) over lapping sets
(c) Equal sets (d) Equivalent sets

24. If $A \cap B \neq \phi$ then A and B are
(a) Disjoint sets (b) over lapping sets
(c) Equal sets (d) Equivalent sets

25. In set builder form A^c is written as
(a) $\{x \mid x \in U \wedge x \in A\}$ (b) $\{x \mid x \in U \vee x \in A\}$
(c) $\{x \mid x \in U \wedge x \notin A\}$ (d) $\{x \mid x \in A \wedge x \notin U\}$

26. If a set consists of those elements of A which are not in B, then the set is
(a) $A \cup B$ (b) $A \cap B$ (c) $A - B$ (d) $B - A$

27. Let A and B are two non empty sets and U be a universal set, then $A - B$
(a) $A \cap B^c$ (b) $B - A$ (c) $\cup$ (d) ϕ

28. If $A \cap B \neq \phi$ i,e sets A and B are disjoint, then $n(A \cup B)$ is equal to
(a) $n(A) + n(B)$ (b) $n(A).\, n(B)$
(c) $n(A) + n(B) - n(A \cap B)$ (d) $n(A \cap B)$

29. If $A \cap B \neq \phi$ i.e sets A and B are overlapping, then $n(A \cup B)$ is equal to
(a) $n(A) + n(B)$ (b) $n(A).n(B)$
(c) $n(A) + n(B) - n(A \cap B)$ (d) $n(A \cap B)$

30. If $A \subseteq B$, then $n(A \cup B)$ is equal to
(a) $n(A)$ (b) $n(B)$ (c) $n(A \cap B)$ (d) 0

31. If $B \subseteq A$, then $n(A \cup B)$ is equal to
(a) $n(A)$ (b) $n(B)$ (c) $n(A \cap B)$ (d) 0

32. If $A \cap B = \phi$, then $n(A \cap B)$ is equal to
(a) $n(A)$ (b) $n(B)$ (c) $n(A \cap B)$ (d) 0

33. If $A \cap B \neq \phi$,i.e. A and B are overlapping sets, then $n(A \cap B)$
(a) 0 (b) $n(A) + n(B)$
(c) $n(A).n(B)$ (d) cannot be determined

34. If $A \subseteq B$, then $n(A \cap B)$ is equal to
(a) $n(A)$ (b) $n(B)$ (c) $n(A) + n(B)$ (d) $n(A).\, n(B)$

35. If $B \subseteq A$ then, $n(A \cap B)$ is equal to
(a) $n(A)$ (b) $n(B)$ (c) $n(A) + n(B)$ (d) $n(A).n(B)$

36. If A and B are Disjoint sets i.e. $A \cap B = \phi$, then $n(A \quad B)$ is equal to
(a) $n(A)$ (b) $n(B)$
(c) $n(A) + n(B) - n(A \cup B)$ (d) $n(A) - n(B)$

37. If A and B are disjoint sets i,e $A \cap B = \phi$, then $n(B - A)$
(a) $n(A) + n(B)$ (b) $n(A).n(B)$
(c) $n(A) + n(B) - n(A \cup B)$ (d) $n(B) - n(A)$

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

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

40. If $B \subseteq A$, $A - B \neq \phi$, then $n(A - B)$
(a) $n(A)$ (b) $n(B)$ (c) $n(A) - n(B)$ (d) 0

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

42. Which of following is true
(a) $\phi - A = \phi$ (b) $A \cup A = A$
(c) $A \cap A = A$ (d) $A - A = \phi$ (e) all of these

43. Which of following is true
(a) $A \cup U = U$ (b) $A - U = \phi$
(c) $A \cap U = A$ (d) $U - A = A'$ (e) all of these

44. If $A \cup B = A$, then
(a) $A \subseteq B$ (b) $B \subseteq A$ (c) $A = \phi$ (d) None of these

45. De Morgan's Laws are
(a) $(A \cup B)' = A' \cup B'$ (b) $(A \cup B)' = A' \cap B'$
(c) $(A \cup B)' = A' + B'$ (d) $(A \cup B)' = (A \cap B)'$

46. De Morgan's Laws are
(a) $(A \cap B)^c = A^c \cap B^c$ (b) $(A \cap B)^c = A^c \cup B^c$
(c) $(A \cap B)^c = A^c B^c$ (d) $(A \cap B)^c = (A \cup B)^c$

47. The way of drawing conclusions form a limited number of observations is called
(a) An Induction (b) deduction
(c) proposition (d) postulate

48. The way of drawing conclusions form premises believed to be true is called
(a) an Induction (b) deduction
(c) proposition (d) postulate

49. A statement which is accepted to be true without proof and used to find other conclusion is called.
(a) An Induction (b) deduction
(c) proposition (d) postulate

50. Logic in which every statement is regarded as true or false is called
(a) Aristotelian logic (b) Non Aristotelian logic
(c) Proposition (d) postulate

51. The logic in which there is a scope of more than two possibilities is called.
(a) Aristotelian logic (b) Non Aristotelian logic
(c) Proposition (d) postulate

52. A statement which can be decided as true or false is called
(a) proposition (b) postulate
(c) compound proposition (d) truth value

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

54. If $p \rightarrow q$ is a conditional, then p is called
(a)antecedent (b) conclusion (c) consequence (d) conjunction

55. If $p \rightarrow q$ is a Implication, then q is called
(a) Hypothesis (b) conclusion (c) antecedent (d) converse

56. The symbol which is used to combine propositions is called
(a) Connective (b)Negation
(c) operator (d) compound proposition

57. If p and q be two propositions, than $p \wedge q$ is
(a) Conjunction (b) disjunction
(c) conditional (d) Bi conditional

58. If p and q be two propositions, then $p \rightarrow q$ is
(a) Conjunction (b) disjunction
(c) conditional (d) Bi conditional

59. If p and q be two propositions, than $p \leftrightarrow q$ is
(a) conjunction (b) disjunction
(c) conditional (d) Bi conditional

60. A compound proposition which is always true is called
(a) Tautology (b) contradiction
(c) Absurdity (d) contingency

61. A compound proposition which is neither always true nor false is called
(a) Tautology (b) contradiction
(c) Absurdity (d) contingency

62. A compound proposition which is always wrong is called
(a) Tautology (b) absurdity
(c) contingency (d) Equivalence

63. If p be proposition, then $(p \vee \sim p$ is
(a) Tautology (b) absurdity (c) contingency (d) Equivalence

If P be any proposition then ($p \wedge \sim p$ is
(a) Tautology (b) absurdity
(c) contingency (d) Equivalence

65. If $\sim p \rightarrow q$ is a conditional, then its converse is
(a) $q \rightarrow \sim p$ (b) $p \rightarrow \sim q$ (c) $\sim q \rightarrow p$ (d) $\sim q \rightarrow \sim p$

66. If $\sim p \rightarrow q$ is a conditional then its inverse is,
(a) $q \rightarrow \sim p$ (b) $p \rightarrow \sim q$ (c) $\sim q \rightarrow p$ (d) $\sim q \rightarrow \sim p$

67. If $\sim p \rightarrow q$ is a conditional then its contra positive is
(a) $q \rightarrow \sim p$ (b) $p \rightarrow \sim q$ (c) $\sim q \rightarrow p$ (d) $\sim q \rightarrow \sim p$

68. If p is a proposition $4 < 5$, q is a proposition $2 + 5 = 8$, than truth value of $p \wedge q$ is
(a) T (b) F (c) Neither T nor F (d) Either T or F

69. If p is a proposition $4 < 5$, q is a proposition $2 + 5 = 8$, then truth value of $p \vee q$ is
(a) T (b) F (c) Nether T for F (d) Either T or F

70. If p is a proposition $4 < 5$, q is a proposition $2 + 5 > 8$, then truth value of $p \rightarrow q$ is
(a) T (b) F (c) Nether T for F (d) Either T or F

71. If p is a proposition $4 < 5$, q is a proposition $2 + 5 \neq 8$, than truth value of $p \leftrightarrow q$ is
(a) T (b) F (c) Nether T for F (d) Either T or F

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

73. For the propositions p and q, $p \rightarrow (p \vee q)$ is
(a) Tautology (b) Absurdity
(c) contingency (d) none of these

74. The words or symbols which convey the idea of quantity or number is called
(a)Quantifier (b) Negation
(c) conditional (d) Truth table

75. The symbol which is used to convey the idea of all objects under consideration is called
(a)Universal quantifier (b) Existential Quantifier
(c) Universal set (d) Non of these

76. The logical form of $(A \cap B)' = A' \cup B'$ is
(a) $\sim (p \wedge q) = \sim p \wedge \sim q$ (b) $\sim (p \wedge q) = \sim p \vee \sim q$
(c) $\sim (p \vee q) = \sim p \vee \sim q$ (d) $\sim (p \vee q) = \sim p \wedge \sim q$

77. The logical form of $(A \cup B)^c = A^c \cap B^c$ is
(a) $\sim (p \wedge q) = \sim p \wedge \sim q$ (b) $\sim (p \wedge q) = \sim p \vee \sim q$
(c) $\sim (p \vee q) = \sim p \vee \sim q$ (d) $\sim (p \vee q) = \sim p \wedge \sim q$

78. If p and q are two propositions, then truth set of $p \vee q$ is
(a) $P \cap Q$ (b) $P \cup Q$ (c) $P - Q$ (d) $Q - P$

79. If p and q are two propositions then truth set of $p \wedge q$ is
(a) $P \cap Q$ (b) $P \cup Q$ (c) $P - Q$ (d) $Q - P$

80. If p and q be two propositions, then truth set of $p \rightarrow q$ is
(a) $P' \cup Q$ (b) $P' \cap Q$ (c) $P = Q$ (d) $P \cap Q'$

81. Truth set of $p \leftrightarrow q$ is
(a) $P' \cap Q'$ (b) $P' \cup Q'$ (c) $P = Q$ (d) $P \cup Q$

82. If p is a proposition, then truth set of $\sim p$ is
(a) P' (b) $\cup$ (c) ϕ (d) None

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

84. Truth set of a contradiction is
(a) Universal set (b) ϕ (c) True (d) False

85. Logical form of $A \cup (B \cap C) = (A \cup B) \cap (A \cup B)$ is
(a) $p \vee (q \wedge r) = (p \vee q) \wedge r$ (b) $p \vee (q \wedge r) = (p \vee q) \wedge (p \vee r)$
(c) $p \wedge (q \vee r) = (p \wedge q) \vee (p \wedge r)$ (d) $p \wedge (q \vee r) = (p \wedge q) \vee r$

86. 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

87. Every subset of Cartesian product $A \times B$ is called
(a) Relation (b) Function (c) Domain (d) Range

88. The empty set { } being the subset of $A \times B$ is
(a) Binary relation (b) Function
(c) Ordered pair (d) None of these

89. If $f : A \rightarrow B$ be a function, then it is an into function if
(a) Range = B (b) Range $\subset$ B
(c) Range is not repeated (d) Domain $\neq$ A

90. A function $f : A \rightarrow B$ is called an on to if
(a) Domain $\subset$ A (b) Range $\subset$ B
(c) Range = B (d) Domain ~ Range

91. A function $f : A \rightarrow B$ is (1 – 1) if
(a) Domain $\subset$ A (b) Range $\subset$ B
(c) Domain = Range (d) Range is not repeated

92. A function $f : A \rightarrow B$ is (1 – 1) and onto if
(a) Domain = A (b) Range $\subseteq$ B
(c) Domain = Range (d) Range = B and Range is not repeated

93. A (1 – 1) function is also called .... Function
(a) Injective (b) Surjective (c) Bijective (d) Inverse

94. An onto function is also called .... Function
(a) Injective (b) Surjective (c) Bijective (d) Inverse

95. A (1 – 1) and on to function is also called .... Function
(a) Injective (b) Surjective (c) Bijective (d) Inverse

96. Inverse of a function Exists only if it is
(a) Injective (b) Bijective (c) Surjective (d) all of these

97. The function $f = \{(x, y) \mid y = mx + c\}$, m & c are real number is
(a) Linear (b) Quadratic (c) A circle (d) A point

98. The function $f = \{(x, y) \mid y = ax^2 + bx + c,\ a \neq 0\}$ is
(a) Linear (b) Quadratic (c) A circle (d) A point

99. Inverse of line is
(a) a line (b) a parabola (c) a point (d) not defined

100. 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

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

102. If a set A has 2 elements and B has 3 elements, then different relations in A× B are
(a) 5 (b) 6 (c) 8 (d) 64

103. If a set A has 2 elements and B has 3 elements, then different function in A× B are
(a) 6 (b) 8 (c) 9 (d) not defined

104. If a set A has m elements and B has n elements, than relations in A× B
(a) $m \times n$ (b) $2^{m \times n}$ (c) $m + n$ (d) $(m \times n)^2$

105. If a set S has n elements, then different relations is A
(a) $2n$ (b) 2^{2n} (c) n^2 (d) 2^n

106. The Inverse function of $\{(x, y) \mid y = mx + c\}$ is
(a) $\{(y, x) \mid x = my + c\}$ (b) $\{(x, y) \mid x = my + c\}$
(c) $\{(y, x) \mid y = mx\}$ (d) not a function

107. An operation which is performed on a single number is called
(a)Unary operation (b)Binary operation
(c)Relation (d) function

108. Squaring a number is
(a) unary operation (b) Binary operation
(c) relation (d) function

109. Which of the following is not a binary operation
(a) + (b) ÷ (c) $\sqrt{\ }$ (d) –

110. For a non empty set G, a function from $G \times G \to G$ is called
(a) Binary operation (b) Unary operation
(c) Groupied (d) Binary relation

111. Any subset of $G \times G$ is called
(a) Binary operation (b)relation
(c)function (d)Cartesian product

112. The set { 1, − 1 , i, − i } is closed w . r. t
(a) + (b) − (c) × (d) *

113. The set of odd number is not closed w. r. t
(a) + (b) × (c) − (d) + & −

114. Let S be a not empty set and * is binary operation in it. If closure property holds in S, then S is
(a) Groupied (b) Semi group (c) Monoid (d) Group

115. If N is set of natural number, then (N, +) is
(a) Groupied (b) Semi group (c) Monoid (d) Group

116. If W is the set of whole numbers, than (W, +) is
(a) Groupied (b) Semi group (c) Monoid (d) Group

117. If N is set of natural number, then (N, ×) or (N, ·) is
(a) Groupied (b) Semi group (c) Monoid (d) Group

118. For a non empty sets S, (P (S), ⋂) is
(a) Groupied (b) Semi group (c) Monoid (d) Group

119. For a non empty sets S, (P (S), ⋃) is
(a) Groupied (b) Semi group (c) Monoid (d) Group

120. If Z is set of Integers, than (Z, ·) is
(a) Groupied (b) Semi group (c) Monoid (d) Group

121. If R is the set of real numbers, then (R , +) is
(a) Groupied (b) Semi group (c) Monoid (d) Group

122. If Q is tl set of rational numbers, than (Q, ·)
(a) Groupied (b) Semi group (c) Monoid (d) Group

123. If S is non empty set. Then identity element in P(S), w .r. t ⋂
(a) { } (b) S (c) { ϕ } (d) does not exist

124. If S is non empty set. Than identity element in P(S), w .r. t ⋃
(a) { } (b) S (c) { ϕ } (d) does not exist

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

126. Identity element in (C, +) is
(a) (0, 0) (b) (0, 1) (c) (1,0) (d) (1,1)

127. Identity element in (C, ·) is
(a) (0, 0) (b) (0, 1) (c) (1, 0) (d) (1, 1)

128. The set of first elements of ordered pairs in a relation is called its:
(a) domain (b) range (c) co-domain (d) relation

129. If A and B are disjoint sets then :
(a) $A \cup B = \phi$ (b) $A \cap B = \phi$ (c) $A \subset B$ (d) $A - B = \phi$

130. If S = {1, 2, 3, 4, 5, 6} then n(S) equals:
(a) 2^6 (b) 6 (c) 6! (d) − 6

131. If $A = \phi$, then P(A) is:
(a) Empty set (b) {0} (c) $\{\phi\}$ (d) none of these

132. The graph of linear function is:
(a) circle (b) straight line (c) parabola (d) triangle

133. A system of linear equations involves at least... equation(s):
(a) 1 (b) 2 (c) 3 (d) 4

134. If $A \subseteq B$, then $A \cap B$ is equal to:
(a) ϕ (b) A (c) B (d) –A

135. If A = {1, 2, 3} , B = {3, 4} , then A – B is:
(a) {4} (b) {1, 2} (c) {1, 4} (d) {3}

136. The number of elements in a set B is 4, the number of elements in P(B)
(a) 16 (b) 12 (c) 8 (d) 4

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

138. Set of all possible sub sets of a set S is called:
(a) equivalent set (b) empty set (c) power set (d) sub set

139. Set of integers is a group w.r.t:
(a) addition (b) multiplication (c) subtraction (d) division

140. f is function from A to B. Domain of f is equal to:
(a) any subset of A (b) $A \times B$ (c) A (d) B

141. Every function is a:
(a) relation (b) inverse function
(c) one to one (d) none of these

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

Chapter - 3 Multiple Choice Questions

(Encircle the correct answer choice)

1. A rectangular array of numbers enclosed by a pair of brackets is called a
(a) matrix (b) Row (c) column (d) determinant

2. The horizontal lines of numbers in a matrix are called
(a) Rows (b) column (c) column matrix (d) Row matrix

3. The vertical lines of numbers in a matrix are called
(a) Rows (b) columns (c) column matrix (d) Row matrix

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

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

6. Any matrix A is called real if all a_{ij} are
   (a) real numbers (b) Imaginary numbers (c) 0 (d) 1
7. If any matrix A has only one row, then it is called
   (a) row matrix (b) column matrix
   (c) Square matrix (d) Rectangular matrix
8. If any matrix A has only one column, then it is called
   (a) row matrix (b) column matrix
   (c) Square matrix (d) Rectangular matrix
9. If a matrix A has same numbers of rows and column, then A is called
   (a) row matrix (b) column matrix
   (c) Square matrix (d) Rectangular matrix
10. If any matrix A has different numbers of rows and column. then A is
    (a) row matrix (b) column matrix
    (c) Square matrix (d) Rectangular matrix
11. Any matrix of order $m \times 1$ is called
    (a) row matrix (b) column matrix
    (c) Square matrix (d) Rectangular matrix
12. Any matrix of order $1 \times n$ is called
    (a) row matrix (b) column matrix
    (c) Square matrix (d) Rectangular matrix
13. For the square matrix A= $[a_{ij}]_{n \times n}$, the elements
    $a_{11}, a_{22}, a_{33} .. a_{nn}$ are
    (a) principal diagonal or leading diagonal (b) Secondary diagonal
    (c) central row (d) central column
14. For the matrix A= $[a_{ij}]_{n \times n}$, the elements
    $a_{1n}, a_{2\,n-1}, a_{3\,n-2}, a_{4\,n-3}, ... a_{n\,1}$ form
    (a) Main diagonal (b) Leading diagonal
    (c) principal diagonal (d) Secondary diagonal
15. For the square matrix A= $[a_{ij}]$. If all $a_{ij} = 0$, $i \neq j$ and at least one
    $a_{ij} \neq 0$, $i = j$, than A is called
    (a) Diagonal matrix (b) Scalar matrix
    (c) Identity matrix (d) Null matrix
16. For the 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) Identity matrix (d) Null matrix
17. If all off diagonal elements are zeros and at least one of the leading diagonal is non zero, then matrix is called
    (a) Diagonal matrix (b) Scalar matrix
    (c) Identity matrix (d) Null matrix
18. The matrix [7] is
    (a) square matrix (b) Row matrix
    (c) column matrix (d) all of these

19. If A is a matrix of order $m \times n$, than the matrix of order $n \times m$ is called
(a) Transpose of A (b) Inverse of A
(c) Main diagonal of A (d) Echelon form of A

20. Two matrix A and B are said to be conformable for addition if
(a) number of columns in A= number of rows in B
(b) number of rows in B = number of columns in A
(c) rows of A = columns of B (d) order of A = order of B

21. If $[a_{ij}] = A$, and $[b_{ij}] = B$, then A = B if and only if
(a) order of A = order of B (b) $a_{ij} = b_{ij}$. $i = j$ only
(c) $a_{ij} = b_{ij}$. ($i \neq j$ only) (d) $a_{ij} = b_{ij}$ for all i & j

22. For any two matrices A and B, $(A + B)^t$ is equal to
(a) $A^t + B^t$ (b) (A+B) (c) $A^t B^t$ (d) $B^t A^t$

23. $(AB)^t$ is equal to
(a) $B^t A^t$ (b) $A^t B^t$ (c) A B (d) $(B A)^t$

24. $(k\,AB)^t =$
(a) $k A^t B^t$ (b) $k B^t A^t$ (c) $k(BA)^t$ (d) $k^t (AB)$

25. Let A be any matrix and n is an Integer, then A + A + A +.... + to n terms
(a) A^n (b) nA (c) A^{n-1} (d) $(n+1)A$

26. Two matrix A and B are conformable for multiplication AB if
(a) number of columns in A = number of rows in B
(b) number of rows in B = number of columns in A
(c) number of rows in A= number of rows in B
(d) number of columns in A = number of columns in B

27. If A is a matrix of order $m \times n$ and B of order $n \times q$, then order of AB is
(a) $m \times q$ (b) $n \times n$ (c) $m \times m$ (d) $q \times m$

28. If A is of order 2×3 and B of order 4×2, then order of AB
(a) 2×2 (b) 3×4 (c) 4×3 (d) Non

29. If A is of order 2×3 and B of order 4×2, then order of BA
(a) 2×2 (b) 3×4 (c) 4×3 (d) Non

30. If AB = BA, then which is true
(a) A and B are multiplicative inverse of each other
(b) One of A or B is null matrix
(c) One of A or B is identity matrix (d) all of these

31. For any square matrix $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, $|A|$ is equal to
(a) $ab - cd$ (b) $ad - bc$ (c) $ac - bd$ (d) $bc - ad$

32. If $A = [-7]$, than $|A|$ is equal to
(a) 7 (b) −7 (c) 0 (d) Not possible

33. If A is any square matrix of order 3, than $|kA|$ is equal to
(a) $|k||A|$ (b) $|k||A|$ (c) $k^2|A|$ (d) $k^3|A|$

34. If A is any square matrix and AB = BA = I . then B is called
(a) Additive Inverse of A (b) Multiplicative Inverse of A
(c) Transpose of A (d) determinant of A

35. If A+ B = B+ A = O , than B is called
(a) Additive Inverse of A (b) Multiplicative Inverse of A
(c) Transpose of A (d) determinant of A

36. If ad joint of A = $\begin{bmatrix} -1 & -2 \\ 3 & 4 \end{bmatrix}$, Then matrix A =

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

37. If A is a non- singular matrix , then A^{-1}
(a) $\frac{1}{|A|}$ Adj . A (b) $\frac{-1}{|A|}$ adj . A (c) $\frac{|A|}{\text{adj}.A}$ (d) $\frac{1}{|A|\,\text{adj}.A}$

38. If AX = B, then X is equal to
(a) $A^{-1}B$ (b) $\frac{B}{A}$ (c) BA^{-1} (d) all of these

39. Inverse of a matrix exist if it is
(a) Singular (b) Non-singular
(c) Null matrix (d) Rectangular matrix

40. Which of the property does not hold in matrix multiplication
(a) Associative (b) Commutative (c) Closure (d) None

41. Let A= $[a_{ij}]$ be a square matrix and M_{ij} is the determinant obtained by deleting i^{th} row and j^{th} column of A . Then Minor of a_{ij} is equal to
(a) M_{ij} (b) $(-1)^{i+j}M_{ij}$ (c) $(-1)^{ij}M_{ij}$ (d) $(-1)^{i+j}a_{ij}$

42. Let A= $[a_{ij}]$ be a square matrix and M_{ij} is the determinant obtained by deleting i^{th} row and j^{th} column of A . Then cofactor of a_{ij} is equal to
(a) M_{ij} (b) $(-1)^{i+j}M_{ij}$ (c) $(-1)^{ij}M_{ij}$ (d) $(-1)^{i+j}a_{ij}$

43. For any square matrix A, It is always true that.
(A) $A=A^t$ (b) $-A=\overline{\overline{A}}$ (c) $|A| = |A^t|$ (d) $A^{-1}=\frac{1}{A}$

44. For any triangular matrix A, $|A|$ is equal to
(a) Product of leading diagonal elements
(b) Sum of leading diagonal elements
(c) Product of secondary diagonal elements
(d) Product of both diagonal elements

45. 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) $k\,|A|$ (c) $|A|$ (d) $k^3\,|A|$

46. For any non singular matrix A, It is true that
(a) $A^{-1} = A$ (b) $|A| = A$ (c) $(A^{-1})^t = (A^t)^{-1}$ (d) Non

47. For any non singular matrix A, It is true that
(a) $(A^{-1})^{-1} = A$ (b) $(A^t)^t = A$ (c) $\bar{\bar{A}} = A$ (d) all of these

48. 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

49. A square matrix $A = [a_{ij}]$ for which all $a_{ij} = 0$, $i > j$, then A is called
(a) Upper Triangular (b) lower Triangular
(c) Symmetric (d) Hermition

50. A square matrix $A = [a_{ij}]$ for which all $a_{ij} = 0$, $i < j$, then A is called
(a) Upper Triangular (b) lower Triangular
(c) Symmetric (d) Hermition

51. A triangular matrix is always a
(a) Diagonal matrix (b) Scalar matrix
(c) Square matrix (d) all of these

52. Any square matrix A is called a singular is
(a) $|A| = 0$ (b) $|A| \neq 0$ (c) $A^t = A$ (d) $AA^{-1} = I$

53. A non empty set F is called field if
(a) F is a an abelian group under '+'
(b) F− {0} is an abelian group under '•'
(c) Right distributive property holds (d) all of these

54. Which of the following sets is a field
(a) R (b) Q (c) C (d) all of these

55. Which of the following sets is not a field
(a) R (b) Q (c) C (d) Z

56. The system of linear Equations involving the same variables are equivalent if they have
(a) Number of equations = number of variables (b) same solutions
(c) different solutions (d) infinity many solutions

57. A square matrix A is symmetric if
(a) $A^t = A$ (b) $A^t = -A$ (c) $(\bar{A})^t = A$ (d) $(\bar{A})^t = -A$

58. A square matrix A is skew symmetric if
(a) $A^t = A$ (b) $A^t = -A$ (c) $(\bar{A})^t = A$ (d) $(\bar{A})^t = -A$

59. A square matrix A is Hermitian if
(a) $A^t = A$ (b) $A^t = -A$ (c) $(\bar{A})^t = A$ (d) $(\bar{A})^t = -A$

60. A square matrix A is skew Hermitian if
(a) $A^t = A$ (b) $A^t = -A$ (c) $(\bar{A})^t = A$ (d) $(\bar{A})^t = -A$

61. The main diagonal elements of a skew symmetric matrix must be
(a)1 (b)0
(c) any non zero number (d) any complex number

62. The main diagonal elements of a skew Hermitian matrix must be
(a) 1 (b) 0
(c) any non zero number (d) any complex number

63. In echelon form of a matrix, the first non zero entry is called
(a) leading entry (b) first entry
(c) Preceding entry (d)Diagonal entry

64. The additive inverse of a matrix exist only if it is
(a) singular (b) non singular
(c)null matrix (d)any matrix of order $m\times n$

65. The multiplicative inverse of a matrix exist only if it is
(a) singular (b) non singular
(c)null matrix (d)any matrix of order $m\times n$

66. If $\begin{vmatrix} a & b \\ 0 & 7 \end{vmatrix} = \begin{vmatrix} 2 & 3 \\ 1 & -9 \end{vmatrix}$ then
(a) $a = -3$ (b) $a = b$ (c) $a = \frac{1}{3}$ (d) $a = \frac{-1}{3}$

67. The number of non zero rows in echelon form of a matrix is called
(a) order of a matrix (b)Rank of a matrix
(c)leading (d)leading row

68. If A is any square matrix then $A + A^t$ is a
(a) Symmetric (b)skew symmetric
(c)Hermitian (d)skew hermitian

69. If A is any square matrix then $A - A^t$ is a
(a) Symmetric (b)skew symmetric
(c)Hermitian (d)skew hermitian

70. If A is any square matrix then $A + (\bar{A})^t$ is a
(a) Symmetric (b)skew symmetric
(c)Hermitian (d)skew hermitian

71. If A is any square matrix then $A - (\bar{A})^t$ is a
(a) Symmetric (b)skew symmetric
(c)Hermitian (d)skew hermitian

72. If A is symmetric (skew symmetric), than A^2 must be
(a) singular (b) non- singular
(c) Symmetric (d) Anti symmetric

73. In a homogeneous system of linear equations, The solution (0,0,0) is
(a)Trivial solution (b)non trivial solution
(c)exact solution (d)Non

74 If $AX = O$, then $X =$
(a) I (b) O (c) A^{-1} (d) not possible

75. If a 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

76. The value of λ for which the system $x + 2y = 4 : 2x + \lambda y = -3$ does not possess the unique solution
(a) 4 (b) − 4 (c) ± 4 (d) any real number

77. If the system $x + 2y = 0$; $2x + \lambda y = 0$ has non trivial solution, then λ is
(a) 4 (b) − 4 (c) ± 4 (d) any real number

78. If $\begin{bmatrix} 2x+3 & 1 \\ -3 & 4 \end{bmatrix} = \begin{bmatrix} -1+x & 1 \\ -3 & 4 \end{bmatrix}$, then $x =$
(a) 3 (b) −3 (c) 4 (d) −4

79. The cofactor A_{22} of $\begin{bmatrix} 1 & 2 & 4 \\ -1 & 2 & 5 \\ 0 & 1 & -1 \end{bmatrix}$ is
(a) 0 (b) −1 (c) 1 (d) 2

80. If $A = [a_{ij}]_{3\times 3}$,then $I_3 A$ is equal to:
(a) A (b) A^{-1} (c) Not possible (d) − A

81. If all the entries of a row of a square matrix A are zero , then $|A|$ equals:
(a) 1 (b) − 1 (c) 0 (d) $-|A|$

82. If $\begin{vmatrix} x & 4 \\ 5 & 10 \end{vmatrix} = 0 \Rightarrow x$ equals:
(a) 2 (b) 4 (c) 6 (d) 8

83. The inverse of unit matrix is:
(a) unit (b) singular (c) skew symmetric (d) rectangular

84. Transpose of a row matrix is:
(a) diagonal matrix (b) zero matrix
(c) column matrix (d) scalar matrix

Chapter - 4 Multiple Choice Questions

(Encircle the correct answer choice)

1. The equation $ax^2 + bx + 9 = 0$ will be quadratic if
(a) $a = 0$, $b \neq 0$ (b) $a \neq 0$
(c) $a = b = 0$ (d) b = any real number

2. solution set of the equation $x^2 - 4x + 4 = 0$ is
(a) {2, − 2} (b) {2} (c) {−2} (d) { 4, − 4 }

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

(a) $x = -b \pm \frac{\sqrt{b^2 - 4ac}}{2a}$ (b) $x = -b \pm \sqrt{\frac{b^2 - 4ac}{2a}}$

(c) $x = -b \pm \frac{\sqrt{b^2 + 4ac}}{2a}$ (d) $x = b \pm \sqrt{\frac{b^2 + 4ac}{2a}}$

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

(a) $y = x^n$ (b) $y = x^{2n}$ (c) $y = x^{-n}$ (d) $y = 1/x$

5. The equation in which variable quantity occurs in exponent is called

(a) Exponentional function (b) Exponent ional equation

(c) Reciprocal equation (d) quadratic equation

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

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

7. The equation which remains unchanged if x is replaced by $\frac{1}{x}$, then it is called

(a) Exponentional function (b) Exponent ional equation

(c) Reciprocal equation (d) quadratic equation

8. The equations involving radical expressions of the variable are called

(a) reciprocal equations (b) radical equations

(c) Quadratic equations (d) exponent ional equations

9. The roots which satisfy radical free equation but not radical equation are called

(a) Extraneous roots (b) radical roots

(c)original roots (d) exact roots

10. The cube roots of unity are

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

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

11. The cube roots of -1 are

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

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

12. Sum of all cube roots of 64, is

(a) 0 (b) 1 (c) 64 (d) -64

13. Product of all cube roots of -1 is

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

14. $16\omega^4 + 16\omega^8 =$
(a) 0 (b) −16 (c) 16 (d) −1

15. $(-1+\sqrt{-3})^5 + (-1-\sqrt{-3})^5$ is equal to
(a) 0 (b) 32 (c) −32 (d) − 1

16. The sum of all four forth roots of unity is
(a) unity (b) 0 (c) −1 (d) Non

17. The product of all four forth roots of unity is
(a) unity (b) 0 (c) −1 (d) Non

18. The sum of all four forth roots are 16 is
(a) 16 (b) −16 (c) 0 (d) 1

19. The Product of all four forth roots of 81 is
(a) −81 (b) 81 (c) 0 (d) 1

20. The complex cube roots of unity are ...... each other
(a) Additive inverse of (b) Equal to each other
(c) Conjugate of each other (d) Non of these

21. The complex cube roots of unity are ...... each other
(a) Multiplicative inverse of each other (b) Reciprocal of each other
(c) Square of each other (d) all of these

22. The complex forth roots of unity are ... each other
(a) Additive inverse (b) equal to (c) square of (d) Non

23. If sum of all cube roots unity is equal to $x^2 + 1$, than x is equal to
(a) −1 (b) 0 (c) $\pm i$ (d) 1

24. If product of all cube roots of unity is equal to p^2+1, then p is
(a) −1 (b) 0 (c) $\pm i$ (d) 1

25. The complex forth roots of unity are ..... each other
(a) Multiplicative Inverse (b) complex conjugate
(c)Additive inverse (d) all of these

26. The expression $a_n x^n + a_{n-1} x^{n-1} + \ldots a_1 x + a_0$. $a_n \neq 0$ is a polynomial of degree n, if n is any
(a) Integer (b) non- negative integer
(c) Positive Integer (d) Real number

27. The expression $x^2 + \frac{1}{x} - 3$ is
(a) polynomial of degree 2 (b) polynomial of degree 3
(c) polynomial of degree 1 (d) not a polynomial

28. If $f(x)$ is divided by $x-a$; then Divided = (Divisor) (....) + Remainder
(a) Divisor (b) Dividend (c) Quotient (d) $f(a)$

29. If $f(x)$ is divided by $x-a$, then by remainder theorem, Remainder is
(a) $f(a)$ (b) $f(-a)$ (c) $f(a) + R$ (d) $x - a = R$

30. 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) $x = -a$

31. $x-2$ is a factor of x^2-kx+4, if k is
(a) 2 (b) 4 (c) $k=8$ (d) -4

32. If $x=-2$ is a root of $kx^4-13x^2+36=0$, then $k=$
(a) 2 (b) -2 (c) 1 (d) -1

33. $x+a$ 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

34. $x-a$ is a factor of x^n-a^n, if n is
(a) any integer (b) any positive integer
(c) any odd integer (d) any real number

35. 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) $\frac{-c}{a}$

36. Product of $ax^2-bx-c=0$ is $(a\neq 0)$
(a) $\frac{b}{a}$ (b) $\frac{-b}{a}$ (c) $\frac{c}{a}$ (d) $\frac{-c}{a}$

37. sum of roots of any quadratic quadratic is
(a) $\frac{\text{coefficient of } x^2}{\text{coefficient of } x}$ (b) $\frac{\text{coefficient of } x}{\text{coefficient of } x^2}$
(c) $-\frac{\text{coeffiant of } x}{\text{coeffciant of } x^2}$ (d) $\frac{\text{constant term}}{\text{coefficient of } x^2}$

38. Product of roots of any quadratic quadratic is
(a) $\frac{\text{coefficient of } x^2}{\text{coefficient of } x}$ (b) $\frac{\text{coefficient of } x}{\text{coefficient of } x^2}$
(c) $-\frac{\text{coeffiant of } x}{\text{coeffciant of } x^2}$ (d) $\frac{\text{constant term}}{\text{coefficient of } x^2}$

39. If sum of roots of $7x^2+px-q=0$ is 7, then $p=$
(a) 7 (b) 49 (c) -49 (d) q

40. If product of roots of $7x^2-px+q=0$ is 1, then $q=$
(a) 7 (b) -7 (c) P (d) 49

41. 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) $x^2+3x+10=0$

42. If S and P are sum and product of roots of a quadratic equation, then equation is
(a) $x^2-Sx+P=0$ (b) $x^2+Sx+P=0$
(c) $x^2+Sx-P=0$ (d) $x^2-Sx-P=0$

43. If α and β the roots of $3x^2-2x+4=0$, then value of $\alpha+\beta$,
(a) $\frac{2}{3}$ (b) $\frac{-2}{3}$ (c) $\frac{4}{3}$ (d) $\frac{-4}{3}$

44. If p and q are the roots of $8x^2 - 3x - 16 = 0$ then pq is equal to
(a) 2 (b) -2 (c) $p + q$ (d) None

45. If $ax^2 + bx + c = 0$, then discriminant is
(a) $\sqrt{b^2 - 4ac}$ (b) $\sqrt{b^2 + 4ac}$ (c) $b^2 - 4ac$ (d) $b^2 + 4ac$

46. If roots of $ax^2 + bx + c = 0$, $(a \neq 0)$ are real ,then
(a) $b^2 - 4ac \geq 0$ (b) $b^2 - 4ac < 0$
(c) $b^2 - 4ac \neq 0$ (d) $b^2 - 4ac \leq 0$

47. The roots of $ax^2 + bx + c = 0$ are imaginary, if
(a) $b^2 - 4ac > 0$ (b) $b^2 - 4ac < 0$
(c) $b^2 - 4ac = 0$ (d) $b^2 - 4ac \neq 0$

48. The roots of $ax^2 + bx + c = 0$ are equal , if
(a) $b^2 - 4ac > 0$ (b) $b^2 - 4ac < 0$
(c) $b^2 - 4ac = 0$ (d) $b^2 + 4ac = 0$

49. If discriminant is positive and perfect square , then roots are
(a) Real & distinct (b) Imaginary & distinct
(c) Rational & distinct (d) irrational and distinct

50. If diseriminant is positive and not perfect square , then roots are
(a) Real & distinct (b) Imaginary & distinct
(c) Rational & distinct (d) irrational and distinct

51. If diseriminant is negative , then roots are
(a) Real & distinct (b) Imaginary & distinct
(c) Rational & distinct (d) irrational and distinct

52. If diseriminant is zero , then roots are
(a) Real & distinct (b) Real & equal
(c) Rational & unequal (d) None of these

53. The roots of $2x^2 - bx + 8 = 0$ are imaginary, if
(a) $b^2 < 64$ (b) $b^2 > 64$ (c) $b^2 = 64$ (d) $b = \pm 8$

54. The equation of the form $ax^2+bx+c = 0$ where $a, b, c \in R$ $a \neq 0$, is called
(a) Reciprocal equation (b) Quadratic equation
(c) Exponential equation (d) polynomial expression

55. Quadratic equation is also called
(a) 2nd degree polynomial equation (b) Polynomial expression
(c) Radical equation (d) All of these

56. Degree of Quadratic equation is
(a) 0 (b) 1 (c) 2 (d) None

57. Graph of quadratic equation is
(a) Straight line (b) Circle (c) Square (d) Parabola

58. Basic techniques for solving quadratic equations is/are
(a) 1 (b) 2 (c) 3 (d) 4

59. To solve $ax^2 + bx + c = 0$ where $a, b, c \in R$ & $a \neq 0$,we can use
(a) Factorization (b)Completing square
(c) Quadratic formula (d) All of these

60. The equation of the form $(x+a)(x+b)(x+c)(x+d)=k$ Where $a+b=c+d$, can be converted into
(a) Reciprocal equation (b) Quadratic equation
(c) Exponential equation (d) All of these

61. For any $n \in Z$, ω^n is equivalent to one of
(a) $1, \omega, \omega^2$ (b) ω, ω^2 (c) $1, \omega$ (d) $1, \omega^2$

62. $\omega^{28}+\omega^{29}+1=$
(a) 0 (b) 1 (c) -1 (d) ω

63. Four forth roots of unity are
(a) $\pm 1, \pm i$ (b) $0, \omega, \omega^2$ (c) $1, \frac{-1+i\sqrt{3}}{2}, \frac{1-i\sqrt{3}}{2}, 0$ (d) Non

64. Synthetic division is a process of
(a) addition (b) multiplication (c) subtraction (d) division

65. $x^2+x-6=0$ has roots:
(a) Real (b) Equal (c) Complex (d) Trivial

66. Roots of equation $x^2+2x+3=0$ are:
(a) real (b) equal (c) rational (d) imaginary

67. If the roots $px^2+qx+1=0$ are equal, then:
(a) $q^2+4p=0$ (b) $p^2+4q=0$ (c) $q^2-4p=0$ (d) $p^2-4q=0$

68. A quadratic equation $Ax^2+Bx+C=0$ becomes linear equation if:
(a) $C=0$ (b) $A=0$ (c) $B=0$ (d) $A=B=C$

Chapter - 5 Multiple Choice Questions

(Encircle the correct answer choice)

1. An open sentence formed by using sign of ' = ' is called a /an
(a) equation (b) formula (c) Rational fraction (d) Theorem

2. If an equation is true for all values of the variable, then it is called
(a) a conditional equation (b) an identity
(c) proper rational fraction (d) All of these

3. If an equation is true only for particular values of the variable, then it is
(a) a conditional equation (b) an identity
(c) proper rational fraction (d) a formula

4. $(x+3)(x+4)=x^2+7x+12$ is a / an
(a) conditional equation (b) identity
(c) proper fraction (d) Linear factors

5. $\sin^2\theta+\cos^2\theta$ is a/ an
(a) conditional equation (b) identity
(c) proper fraction (d) Theorem

6. To express a single rational function as a sum of two or more single rational functions is called
   (a) partial fractions (b) partial fraction resolution
   (c) proper fraction (d) Improper fraction
7. When a single rational fraction is expressed as a sum of two or more single rational fractions, then each single fraction is called
   (a) partial fractions (b) partial fraction resolution
   (c) proper fraction (d) Improper fraction
8. The value of a, when $(a+b)^2 = a^2 + 2ab + b^2$ is an identity
   (a) an integer only (b) any real number
   (c) only positive number (d) cannot be determined
9. If $\begin{vmatrix} 7x & 3x \\ 2x^2 & p \end{vmatrix} = 7xp - 6x^3$ is a/ an
   (a) equation (b) identity (c)determinant (d)Non
10. The quotient of two polynomials $\frac{p(x)}{q(x)}$, $q(x) \neq 0$ is called
   (a) Rational fraction (b)An irrational fraction
   (c) Proper fraction (d) Partial fraction
11. A fraction $\frac{p(x)}{q(x)}$ is a 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 $p(x)$ (d)degree of $p(x) \geq$ degree of $q(x)$
12. A fraction $\frac{p(x)}{q(x)}$ is an improper rational fraction if
   (a) degree of $p(x)$ < degree of $q(x)$ (b) degree of $p(x)$= degree of $q(x)$
   (c) degree of $p(x) \leq$ degree of $p(x)$ (d)degree of $p(x) \geq$ degree of $q(x)$
13. A mixed form of fraction is
   (a)an integer + improper fraction
   (b)a polynomial + improper fraction
   (c) a polynomial + proper fraction
   (d)a polynomial + rational fraction
14. When a rational fraction is separated into partial fractions, then Result is always
   (a) a conditional equations (b) an identity
   (c) a partial fraction (d) an improper fraction
15. The partial fractions of $\frac{x^2-10x+13}{(x-1)(x^2-5x+6)}$ are of the form
   (a) $\frac{A}{x-1}+\frac{Bx+C}{x-3}+\frac{Dx+E}{x-2}$ (b) $\frac{A}{x-1}+\frac{B}{x-2}+\frac{C}{x-3}$
   (c) $\frac{Ax+B}{x-1}+\frac{C}{x^2-5x+6}$ (d) None of these

16. $\frac{x^2-5x+7}{(x-1)(x^2-1)} = \frac{A}{x-1} + \text{.....................}$

(a) $\frac{B}{x+1}$ (b) $\frac{B}{(x-1)^2}+\frac{C}{x+1}$ (c) $\frac{B}{x-1}+\frac{C}{x+1}$ (d) $\frac{Dx+E}{x^2-1}$

17. 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

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

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

19. The number of partial fraction of $\frac{x^4}{x^3-1}$ are

(a) 1 (b) 2 (c) 3 (d) none of these

20. If, $\frac{7x+25}{(x+3)(x+4)} = \frac{A}{x+3}+\frac{B}{x+4}$, then B is equal to

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

21. If $\frac{x^2-10x+13}{(x-1)(x^2-5x+6)} = \frac{A}{x-2}+\frac{B}{x-3}+\frac{C}{x-1}$, then C is equal to

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

22. If $\frac{2x^2+x^2-x-3}{x(2x+3)(x-1)} = \frac{A}{x}+\frac{8}{2x+3}+\frac{C}{x-1}$, then A is equal to

(a) 1 (b) 2 (c) x (d) none of these

23. Partial fractions of $\frac{x^2+1}{(x-1)(x+1)}$ are of the form

(a) $\frac{Ax+B}{x^2-1}$ (b) $\frac{A}{x-1}+\frac{B}{x+1}$ (c) $1+\frac{A}{x-1}+\frac{B}{x+1}$ (d) $1+\frac{Ax+B}{x^2-1}$

24. If $\frac{1}{(x+1)^2(x^2-1)} = \frac{A}{x-1}+\frac{B}{x+1}+\frac{C}{(x+1)^2}+\frac{D}{(x+1)^3}$, then A =

(a) $\frac{1}{8}$ (b) $-\frac{1}{2}$ (c) $-\frac{1}{8}$ (d) $-\frac{1}{4}$

25. A quadratic factor which can not be written as a product of linear factors with real coefficients is called

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

26. Which is a reducible factor

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

27. Particle fraction of $\frac{1}{x^2-1}=$

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

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

28. Partial fraction of $\frac{x^2+1}{x^3+1}$ will be of the form

(a) $\frac{A}{x-1}-\frac{B}{x^2-x+1}$ (b) $\frac{A}{x+1}-\frac{B}{x^2-x+1}$

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

29. Number of partial fractions of the fraction $\frac{1}{x(x-1)^3}$ are:

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

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

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

31. The quotient of two polynomials $\frac{P(x)}{Q(x)}$, $Q(x)\neq 0$ with no common factor is called:

(a) algebraic relation (b) rational fraction
(c) partial fraction (d) polynomial

32. The partial fractions of $\frac{1}{(x+1)(x-1)}$ are:

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

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

Chapter - 6 Multiple Choice Questions

(Encircle the correct answer choice)

1. An arrangement of numbers according to some definite rule is called
(a) Sequence (b) Combination (c) Series (d) Permutation

2. A sequence is also know as
   (a) Real sequence (b) Progression
   (c) Arrangement (d) Complex sequence
3. A sequence is a function whose domain is set of
   (a) Integers (Z) (b) Rational numbers (Q)
   (c) Natural numbers (d) real number
4. A sequence whose range is R i.e set of real numbers, is called
   (a) Real sequence (b) Imaginary sequence
   (c) Natural sequence (d) Complex sequence
5. If $a_n = \{n + (\ 1)^n\}$, then $a_{10} =$
   (a) 10 (b) 9 (c) 11 (d) none of these
6. The last term of an infinite sequence
   (a) is n th term (b)is a_n (c) is general term (d)dose not exist
7. The next term of the sequence 1, 2, 12, 40 ... is
   (a) 112 (b) 120 (c) 124 (d) none of these
8. If $a_n\ \ a_{n\ 1} = n + 1$ and $a_4 = 14$ then $a_5 =$
   (a) 3 (b) 5 (c) 14 (d) 20
9. If $a_n = n\ a_{n\ 1}$; $a_1 = 1$ then $a_4 = ?$
   (a) 6 (b) 24 (c) 110 (d) 660
10. 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
11. If $\{a_n\}$ is an Arithmetic sequence then common difference is
    (a) $a_{n+1}\ \ a_{n\ 1}$ (b) $a_{n+1}\ \ a_n$
    (c) $a_n\ \ a_{n+1}$ (d) $a_{n\ 1}\ \ a_{n+1}$, $n \in N$, $n > 1$
12. The general term of an A.P is
    (a) $a_n = a + (n - 1)\,d$ (b) $a_n = a - (n - 1)\,d$
    (c) $a_n = a + (n + 1)\,d$ (d) $a_n = a - (n + 1)\,d$
13. If $a_n = 5 - 3n + 2n^2$, then $a_{2n} =$
    (a) $5 - 6n + 2n^2$ (b) $5 - 6n + 4n^2$
    (c) $5 + 6n + 4n^2$ (d) $5 - 6n + 8n^2$
14. If $a_{n\ 2} = 3n - 11$, then $a_n =$
    (a) $3n + 5$ (b) $3n - 5$ (c) $3n - 9$ (d) $3n - 13$
15. If n^{th} term of an A.P is $3n - 1$ then 10^{th} term is
    (a) 9 (b) 29 (c) 12 (d) cannot be determined
16. n^{th} term of the series $\left(\frac{1}{3}\right)^2 + 1 + \left(\frac{5}{3}\right)^2 + \left(\frac{7}{3}\right)^2 + \ldots$
    (a) $\left(\frac{2n-1}{3}\right)^2$ (b) $\left(\frac{2n+1}{3}\right)^2$ (c) $\left(\frac{2n}{3}\right)^2$ (d) cannot be determined
17. If $a_{n\ 1}$, $a_n\ \ a_{n+1}$ are in A.P , then a_n is called
    (a) A.M (b) G.M (c) H.M (d) Mid point

18. Arithmetic mean between c and d is

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

19. If $a_{n-1} a_n, a_{n+1}$ are in A.P then $a_n =$

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

20. The Arithmetic mean between $\sqrt{2}$ and $3\sqrt{2}$ is

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

21. The sum of terms of a sequence is called

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

22. Forth partial sum of the sequence $\{n^2\}$ is

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

23. Sum of n term of an Arithmetic series S_n is equal to

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

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

24. Sum of n term of an Arithmetic series in S_n is equal to

(a) $\frac{n}{2}(a_1 + a_n)$ (b) $\frac{n}{2}(a_1 - 1)$ (c) $\frac{a + a_n}{2}$ (d) $n(a_1 + a_n)$

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

26. No term of a G.P is

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

27. 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) $a_n = \frac{a}{r^n - 1}$

28. If a, G, b are in G.P, then

(a) $G = ab$ (b) $G = \pm\sqrt{ab}$ (c) $G = \frac{a+b}{2}$ (d) $G = \frac{2ab}{a+b}$

29. If a, G, b are in G.P, then G is called

(a) common ratio (b) Geometric mean

(c) centre (d) Geometric series

30. If $G_1, G_2, G_3 \ldots, G_n$ be Geometric means between a and b, then $G =$

(a) $\sqrt{G_1 G_2 \ldots\ldots G_n}$ (b) $(G_1 G_2 \ldots\ldots G_n)^{\frac{1}{n}}$

(c) $\frac{G_1 + G_2 + \ldots + G_n}{n}$ (d) $\frac{1}{n}(G_1, G_2, \ldots, G_n)$

31. Sum of n term of a geometric series S_n is equal to

(a) $\frac{a(1 \;\; r^n)}{1 \;\; r}$ (b) $\frac{a(1 \;\; r^{n \; 1})}{1 \;\; r}$ (c) $\frac{a(r^n \;\; 1)}{1 \;\; r}$ (d) ar^{n-1}, for $r \neq 1$

32. The sum of infinite geometric series is valid if

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

33. For the series $1 + 5 + 25 + 125 + \ldots + \infty$, the sum is

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

34. An infinite geometric series is convergent if

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

35. An infinite geometric series is Divergent if

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

36. If sum of a series is defined, then it is called

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

37. If sum of a series in not defined, then it is called

(a) Convergent series (b) Divergent series
(c) finite series (d) Infinite series

38. If the series $\frac{x}{2} + \frac{x^2}{4} + \frac{x^3}{8} + \ldots$ is convergent, then

(a) $|x| \leq 2$ (b) $|x| \leq 1$ (c) $0 < x < 2$ (d) $|x| \geq 2$

39. If the series $\frac{2}{3}x + \frac{4}{9}x^2 + \frac{8}{27}x^3 + \ldots$ is Divergent, then

(a) $|\frac{2}{3}x| < 1$ (b) $\frac{2}{3}|x| < 1$ (c) $|x| \geq 1$ (d) $|\frac{2}{3}x| \geq 1$

40. The interval in which series $1 + 2x + 4x^2 + 8x^3 + \ldots$ is convergent is

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

41. If the reciprocals of the terms of a sequence form an A.P, then it is

(a) Harmonic sequence (b) Arithmetic sequence
(c) Reciprocal sequence (d) series

42. The n^{th} 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) $\frac{1}{3n+1}$

43. General term of an H.P is

(a) $a_n = \frac{1}{a + (n+1)d}$ (b) $a_n = \frac{1}{a + (n-1)d}$

(c) $a_n = \frac{1}{a + nd}$ (d) $a_n = a + (n \;\; 1)d$

44. Harmonic mean between 2 and 8 is

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

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

(a) $G^2 = A\,H$ (b) A, G ,H are in G.P

(c) $A > G > H$ (d) all of these

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

(a) $G^2 = A\,H$ (b) A, G , H are in G.P

(c) $A < G < H$ (d) all of these

47. If a and b are two negative number, then

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

(c) $A = G = H$ (d) $A \geq G \geq H$

48. If a and b are two positive number , then

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

(c) $A = G = H$ (d) $A \leq G \leq H$

49. If a and b have opposite signs then Geometric mean is

(a) an imaginary number (b) non zero real number

(c) Real number (d) Negative

50. If $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$ is A.M between a & b , then n is equal to

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

51. If $\frac{a^n + b^n}{a^{n-1} + b^{n-1}}$ is G.M between a & b , then n is equal to

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

52. If $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$ is H .M between a & b , then n is equal to

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

53. If $a, ar^2, ar^4, \ldots$ form a G. P then $\frac{1}{a}, \frac{1}{ar^2}, \frac{1}{ar^4} \ldots$ is

(a) an A . P (b) a G .P

(c) an H . P (d) a reciprocal sequence

54. $\sum n$ is equal to

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

55. $\sum n^2$ is equal to

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

56. $\sum n^3$ is equal to

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

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

(a) $2n+1$ (b) $4n^2+4n+1$

(c) $(2n-1)^2$ (d) cannot be determined

58. The sum of n A.Ms between a & b is equal to

(a) $n\left(\frac{a+b}{2}\right)$ (b) $n(a+b)$

(c) $n[a+(n-1)d]$ (d) $a+(n-1)d$

59. The sum of 5 A.Ms between 2 & 8 is

(a) 25 (b) 50 (c) 40 (d) 10

60. If both x & y are +ve distinct real numbers, then the G.M. between is

(a) less than their A.M. (b) Equal to A. M.

(c) Greater than A.M. (d) None of these

61. The numbers $a-d$, a, $a+d$ are in

(a) arithmetic progression (b) geometric progression

(c) harmonic progression (d) harmonic series

62. If $|r| < 1$, then, $S_n =$

(a) $\frac{a_1(1-r^n)}{1-r}$ (b) $\frac{a_1(r^n-1)}{1-r}$ (c) $\frac{a_1(r^n-1)}{r-1}$ (d) $\frac{a_1(1-r^n)}{r-1}$

63. With usual notations, AH equals

(a) A^2 (b) H^2 (c) G^2 (d) $-G^2$

64. If $a_{n-1} = 2n+1$, then a_n is equal to

(a) $2n+3$ (b) $2n-3$ (c) $2n-1$ (d) $2n+1$

65. With usual notation nth term of A.P is

(a) $a_n = a_1 + (n+1)d$ (b) $a_n = a_1 - (n-1)d$

(c) $a_n = a_1 + a_{n+1}$ (d) $a_n = a_1 + (n-1)d$

66. G. M between -2 and 8 is:

(a) $4i$ or $-4i$ (b) 4 or -4 (c) 16 or -16 (d) 3 or -5

67. H. M between -2 and 8 equals:

(a) $\frac{-3}{16}$ (b) $\frac{-16}{3}$ (c) $\frac{-16}{5}$ (d) $\frac{-5}{16}$

68. n^{th} term of A.P is:

(a) $a_1 + nd$ (b) $a_1 + (n-1)d$ (c) $na_1 + d$ (d) $\frac{a_1}{n} + d$

69. Fifth term of $\frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \ldots\ldots$ is

(a) 1/9 (b) 9 (c) 1/11 (d) 11

70. $\frac{1}{2}, \frac{1}{7}, \frac{1}{12}, \ldots\ldots\ldots$ is:

(a) An A.P (b) G.P (c) H.P (d) Harmonic series

71. If $G_1, G_2, \text{-----------} G_n$ are n geometric means between a and b, then $(G_1 . G_2 \ldots\ldots\ldots G_n)^{1/n}$ is.

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

72. Harmonic mean between two numbers 'a' and 'b' is:

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

73. General term of a sequence is $(-1)^n n^2$. Its 4th term is:

(a) -4 (b) -16 (c) 16 (d) 4

Chapter - 7 Multiple Choice Questions

(*Encircle the correct answer choice*)

1. The factorial notation was introduced by

(a) Christian kramp (b) Newton (c) Candy (d) Boyal

2. $n! = n(n-1)(n-2)\ldots3.2.1$ is defined only when n is

(a) positive integer (b) an integer

(c) Real number (d) whole number

3. $0!$ is equal to

(a) 0 (b) 1 (c) -1 (d) not defined

4. $(-1)!$ is equal to

(a) 0 (b) 1 (c) -1 (d) not defined

5. The factorial form of 12.11.10. is

(a) $\frac{12!}{9!}$ (b) $12!$ (c) $(\frac{12}{9})!$ (d) $(12!)(9!)$

6. The factorial form of $n(n-1)(n-2)\ldots(n-r+1)$ is

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

7. The factorial form of 6.5.4 is

(a) $(\frac{6}{3})!$ (b) $6!$ (c) $5!$ (d) None of these

8. If an event A can occurs in p ways B can occur in q ways ,then number of way that both events can occur is

(a) $p+q$ (b) $p.q$ (c) $(pq)!$ (d) $(p+q)!$

9. An arrangement of n objects according to some definite order is called

(a) Combination (b) permutation

(c) factorial (d) ordered arrangement

10. An arrangement of n objects ,without any order is called
(a) Combination (b) permutation
(c) factorial (d) ordered arrangement

11. An arrangement of n objects taking r out of then at a time without any order is
(a) ${}^nC_r$ (b) ${}^nP_r$ (c) $(n+r)!$ (d) $(nr)!$

12. An arrangement of n objects taking r out of then at a time ,with some definite order is
(a) ${}^nC_r$ (b) ${}^nP_r$ (c) $(n+r)!$ (d) $(nr)!$

13. 8. 7 .6 is equal to
(a) ${}^8P_3$ (b) ${}^8C_3$ (c) ${}^8P_5$ (d) ${}^8C_5$

14. In a permutation ${}^nP_r$ or $P(n, r)$, it is always true that
(a) $n \geq r$ (b) $n < r$ (c) $n \leq r$ (d) $n < 0, r < 0$

15. Different signals of 5 flags of different colures , using 3 at a time is
(a) 60 (b) 5 (c) 120 (d) 10

16. If $r = n$, then ${}^nP_r$ is equal to
(a) $r!$ (b) $(n-r)!$ (c) 1 (d) 0

17. ${}^{10}P_7$ is equal to
(a) 10 (b) 720 (c) 120 (d) non of these

18. If these are p like object of one kind and q like object of 2nd kind out of n objects, then different permutation are
(a) $\frac{n!}{(n-p)!(n-q)!}$ (b) $\frac{n!}{(pq)!}$ (c) $\frac{n!}{p!q!}$ (d) $n!-1$

19. Different circular permutations of n objects are
(a) $n!$ (b) $(n-1)!$ (c) $(n+1)!$ (d) $n!-1$

20. The number of ways that a necklace of n beads of different colures be made is
(a) $n!$ (b) $\frac{n!}{2}$ (c) $\frac{n!-1}{2}$ (d) $\frac{(n-1)!}{2}$

21. The numbers of permutations of the word PANAMA are
(a) 120 (b) 20 (c) 10 (d) 60

22. The numbers of permutation of the word PANAMA when each word starts with P is
(a) 120 (b) 20 (c) 10 (d) 60

23. 5 Persons can be seated at a round table in ways
(a) 120 (b) 24 (c) 720 (d) 12

24. ${}^nP_r$ is equal to
(a) $\frac{n!}{r!}$ (b) $\frac{n!}{r!(n-r)!}$ (c) $\frac{n!}{(n-r)!}$ (d) $\frac{n!}{r!(n+r)!}$

25. ${}^nC_r$ is equal to
(a) $\frac{n!}{r!}$ (b) $\frac{n!}{r!(n-r)!}$ (c) $\frac{n!}{(n-r)!}$ (d) $\frac{n!}{r!(n+r)!}$

26. Complementary combination is.
(a) ${}^nC_r = {}^nC_{r-1}$ (b) ${}^nC_r = {}^nC_{n-r}$ (c) ${}^nC_{r+1} = {}^nC_{r-1}$ (d) ${}^nC_r = {}^nP_r$

27. If ${}^nC_8 = {}^nC_{12}$, then n is equal to
(a) 8 (b) 12 (c) 20 (d) 4

28. The number of Triangles of an n sided polygon is
(a) ${}^nC_3$ (b) ${}^nP_3$ (c) ${}^nP_3 - n$ (d) ${}^nC_3 - n$

29. ${}^{n-1}C_r + {}^{n-1}C_{r-1} =$
(a) ${}^{n-1}C_r$ (b) ${}^nC_r$ (c) ${}^{n-1}C_{r-1}$ (d) ${}^nC_{r-1}$

30. ${}^nC_7 + {}^nC_8 =$
(a) ${}^{n+1}C_7$ (b) ${}^{n+1}C_8$ (c) ${}^{n+1}C_9$ (d) ${}^nC_9$

31. The number of Diagonals of a 5 sided polygon is
(a) 5 (b) 20 (c) 15 (d) 10

32. The number of Triangles of a 5 sided Polygon is
(a) 5 (b) 10 (c) 15 (d) 20

33. A hockey 11 out of 15 players be selected, different teams if a particular players must be selected is
(a) ${}^{15}C_{11}$ (b) ${}^{15}P_{11}$ (c) ${}^{14}C_{10}$ (d) ${}^{14}C_{10}$

34. The set of all possible outcomes of an experiment is
(a) Sample space (b) Event
(c) Simple Event (d) Random Experiment

35. Any particular outcome of an experiment is called
(a) Sample space (b) an Event
(c) a Trial (d) Random Variable

36. A fair coin is tossed, the probability of getting a head or tail is
(a) 1 (b) 0 (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

37. For two events A and B if $A \cap B = \phi$, then events A and B are called
(a) mutually exclusive (b) not mutually exclusive
(c) Overlapping (d) dependent events

38. If A and B are mutually exclusive (Disjoint) events, then $n(A \cap B)$ is
(a) 0 (b) 1 (c) between 0 and 1 (d) not defined

39. If two events A and B have equal chance of occurrence, then the events are
(a) Equally likely (b) Not equally likely
(c) Dependent (d) not mutually exclusive

40. If E be an event of a sample space S, then
(a) $P(E) = \frac{n(E)}{n(S)}$ (b) $0 < P(E) < 1$ (c) $P(E) > 1$ (d) all of these

41. If E be an event of a sample space S, then
(a) $P(E) = \frac{n(S)}{n(E)}$ (b) $0 \le P(E) \le 1$
(c) $0 < P(E) < 1$ (d) all of these

42. If an event always occurs, then it is called
(a) Null event (b) possible event
(c) certain event (d) independent event

43. If E is a certain event, then
(a) $P(E) = 0$ (b) $P(E) = 1$ (c) $0 < P(E) < 1$ (d) $P(E) > 1$

44. If E is an impossible event, then
(a) $P(E) = 0$ (b) $P(E) = 1$ (c) $P(E) \neq 0$ (d) $0 < P(E) < 1$

45. Non occurrence of an event E is denoted by
(a) $\sim E$ (b) $\overline{E}$ (c) E^c (d) all of these

46. If E be an event of a sample space S, then
(a) $P(E) = 1 + P(\overline{E})$ (b) $P(\overline{E}) = 1 + P(E)$
(c) $P(E) = 1 - P(\overline{E})$ (d) $P(\overline{E}) = 1 - P(E)$

47. Let $S = \{1, 2, 3, \ldots, 10\}$ the probability that a number is divisible by 4 is
(a) $\frac{2}{5}$ (b) $\frac{1}{5}$ (c) $\frac{1}{10}$ (d) $\frac{1}{2}$

48. There are 5 green and 3 red balls in a box. One ball is taken, the probability that ball is green or red is
(a) $\frac{3}{8}$ (b) 1 (c) $\frac{15}{8}$ (d) $\frac{15}{64}$

49. These are 5 green and 3 red balls in a box the one ball taken is probability of getting a black ball is.
(a) 0 (b) 1 (c) $\frac{15}{8}$ (d) $\frac{15}{64}$

50. Three dice are rolled simultaneously, then $n(S)$ is equal to
(a) 36 (b) 18 (c) 216 (d) 6

51. A coin is tossed 5 times, then $n(S)$ is equal to
(a) 32 (b) 25 (c) 10 (d) 20

52. A bag contain 40 balls out of which 15 are black, then probability of a ball not black is
(a) $\frac{3}{8}$ (b) $\frac{5}{8}$ (c) $\frac{15}{8}$ (d) $\frac{15}{64}$

53. Two teams A and B are playing a match, the probability that team A dose not loose is
(a) $\frac{1}{3}$ (b) $\frac{2}{3}$ (c) 1 (d) 0

54. If $P(E) = \frac{7}{12}$, $n(S) = 8400$, $n(E)$ is equal to
(a) 108 (b) 4900 (c) 144 (d) 14400

55. A die is rolled, the probability of getting 3 or 5 is
(a) $\frac{2}{3}$ (b) $\frac{1}{3}$ (c) $\frac{15}{36}$ (d) $\frac{1}{36}$

56. A die is rolled, the probability of getting 3 or an even number is

(a) $\frac{1}{12}$ (b) $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) non of these

57. A coin is tossed 4 times, then probability that at least one head appeases in 4 tosses is

(a) $\frac{1}{16}$ (b) $\frac{15}{16}$ (c) $\frac{1}{4}$ (d) $\frac{3}{4}$

58. If A and B are disjoint event, then $P(A \cup B)$ is equal to.

(a) $P(A) + P(B)$ (b) $P(A). P(B)$
(c) $P(A) + P(B) - P(A \cap B)$ (d) $P(A \cap B)$

59. If A and B are over lapping event, then $P(A \cup B)$ is equal to

(a) $P(A) + P(B)$ (b) $P(A). P(B)$
(c) $P(A) + P(B) - P(A \cap B)$ (d) $P(A \cap B)$

60. If $S = \{1, 2, \ldots 10\}$, $A = \{1,3,5\}$ $B = \{2,4,6\}$ then $P(A \cup B)$ is equal to

(a) $\frac{3}{5}$ (b) $\frac{2}{5}$ (c) $\frac{9}{100}$ (d) 0

61. If two event do not effect the occurrence or non occurrence of each other then, these are called

(a) Independent events (b) Dependent events
(c) Equal events (d) Different events

62. If two event effect the occurrence or non occurrence of each other, then these are called

(a) Independent events (b) Dependent events
(c) Equal events (d) Different events

63. If A, B and C are Independent event, then $P(A \cap B \cap C)$ is equal to

(a) $P(A) + P(B) + P(C)$ (b) $P(A). P(B) .P(C)$
(c) $P(A \cup B \cup C)$ (d) none

64. If A, B and C are disjoint events then $P(A \cup B \cup C)$ is equal to

(a) $P(A) + P(B) + P(C)$ (b) $P(A). P(B) .P(C)$
(c) $P(A \cap B \cap C)$ (d) none

65. If $P(A) = \frac{5}{7}$, $P(B) = \frac{7}{9}$, $P(A \cap B)$ is equal to

(a) $\frac{5}{9}$ (b) $\frac{3}{4}$ (c) $\frac{94}{63}$ (d) None of these

66. If A and B are two independent events, $P(A \cap B) = \frac{1}{169}$, $P(A) = \frac{1}{13}$, $P(B) =$

(a) $\frac{1}{13}$ (b) $\frac{1}{2097}$ (c) 13 (d) $\frac{12}{169}$

67. The number of ways for sitting 4 persons in a train on a straight sofa is

(a) 24 (b) 6 (c) 4 (d) None of these

68. Four persons want to sit in a circular sofa, the total ways are

(a) 24 (b) 6 (c) 4 (d) None of these

69. 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) $\frac{17}{13}$

70. If ${}^nC_6 = {}^nC_{12}$, then n equals
(a) 18 (b) 12 (c) 6 (d) 20

71. For independent events P(A∩B) =
(a) P(A) + P(B) (b) P(A) – P(B)
(c) P(A) . P(B) (d) $\frac{P(A)}{P(B)}$

72. If $\binom{n}{12} = \binom{n}{8}$, then the value of n =
(a) 15 (b) 16 (c) 18 (d) 20

73. If A and B are disjoint event then $P(A \cup B) =$
(a) P(A) + P(B) (b) P(A) + P(B) – P(A ∩ B)
(c) P(A) – P(B) + P(A ∩ B) (d) P(A)*P(B) – P(A ∩ B

74. With usual notation ${}^nP_n$ equals:
(a) n (b) 0 (c) 0 ! (d) n !

75. If ${}^nc_6 = {}^nc_8$ then, n equals:
(a) 20 (b) 24 (c) 14 (d) –14

76. Sample space for tossing a coin is:
(a) {H} (b) {T} (c) {H, H} (d) {H, T}

77. 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)

Chapter - 8 Multiple Choice Questions

(*Encircle the correct answer choice*)

1. The statement $4^n > 3^n + 4$ is true when
(a) $n = 0$ (b) $n = 1$
(c) $n \geq 2$ (d) n is any positive integer

2. The statement $3^n < n\,!$ is true , when
(a) $n = 2$ (b) $n = 4$ (c) $n = 6$ (d) $n > 6$

3. The general term of the binomial expansion $(a + x)^n$ is
(a) $\binom{n}{r} a^n x^r$ (b) $\binom{n}{r} a^{n-r} x^r$ (c) $\binom{n}{r} a^r\, r^{n-r}$ (d) $\binom{n}{r} (a\, x)^{n-r}$

4. The number of terms in the expansion of $(a + b)^n$ are
(a) n (b) $n + 1$ (c) 2^n (d) 2^{n-1}

5. In the expansion $(a+x)^n$, the sum of exponents of a and x is
(a) n (b) $n-1$ (c) $n+1$ (d) $2n$

6. The $(r+1)^{th}$ term in the expansion of $(a+x)^n$ is
(a) $\binom{n}{r+1} a^{n-r} x^r$ (b) $\binom{n}{r} a^{n-r} x^r$
(c) $\binom{n}{r} a^{n-r+1} x^{r+1}$ (d) $\binom{n}{r} a^{n-(r+1)} x^{r+1}$

7. In the expansion $(a+x)^n$ the exponent of 'a'
(a) decreases from n to 0 (b) Increases from 0 to n
(c) remains n every where (d) becomes n at the end

8. In the expansion $(a+x)^n$ the exponent of 'x'
(a) decreases from n to 0 (b) Increases from 0 to n
(c) remains n every where (d) becomes 0 at the end

9. Middle term/s in the expansion of $(a+b)^{11}$ is/ are
(a) T_6 (b) T_5 & T_6 (c) T_6 & T_7 (d) T_5

10. 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

11. 6^{th} term of the expansion $(a+2x)^{13}$ is
(a) $\binom{13}{5} a^8 . x^5$ (b) $\binom{13}{5} a^8 . 2^5 . x^5$ (c) $\binom{13}{8} a^5 . x^8$ (d) $\binom{13}{8} a^5 . 2^8 . x^8$

12. 4^{th} term from the end in the expansion of $(a+b)^9$ is
(a) T_6 (b) T_4 (c) T_7 (d) non of these

13. The term independent of x in the expansion of $(a+2x)^n$ is
(a) first term (b) Middle term (c) last term (d) 2^{nd} last term

14. The coefficient of the last term in the expansion of $(2-x)^7$ is
(a) 1 (b) -1 (c) 7 (d) -7

15. Sum of all binomial coefficients in the expansion of $(a+x)^n$ is
(a) 2^n (b) 2^{n-1} (c) 2^{n+1} (d) $n+1$

16. Sum of odd binomial coefficients in the expansion of $(a+x)^n$ is
(a) 2^n (b) 2^{n-1} (c) 2^{n+1} (d) $n+1$

17. Sum of even binomial coefficients in the expansion of $(a+x)^n$ is
(a) 2^n (b) 2^{n-1} (c) 2^{n+1} (d) $n+1$

18. $\binom{n+1}{0} + \binom{n+1}{1} + \binom{n+1}{2} + \dots\dots + \binom{n+1}{n+1}$ is equal to
(a) 2^n (b) 2^{n+1} (c) 2^{n-1} (d) cannot be determined

19. $\binom{2n}{0} + \binom{2n}{1} + \binom{2n}{2} + \dots\dots + \binom{2n}{2n}$ is equal to
(a) 2^n (b) 2^{2n} (c) 2^{2n-1} (d) 2^{2n+1}

20. If n is odd, the middle term/s in $(a+x)^n$ is/ are

(a) $(\frac{n+1}{2})^{th}$ (b) $(\frac{n}{2}+1)^{th}$

(c) $(\frac{n+1}{2})^{th}$ & $(\frac{n+3}{2})^{th}$ (d) $(\frac{n}{2}+1)^{th}$ & $(\frac{n}{2}+2)^{th}$

21. If n is even the middle terms in $(a+x)^n$ is

(a) $(\frac{n+1}{2})^{th}$ (b) $(\frac{n}{2}+1)^{th}$

(c) $(\frac{n+1}{2})^{th}$ & $(\frac{n+3}{2})^{th}$ (d) $(\frac{n}{2}+1)^{th}$ & $(\frac{n}{2}+2)^{th}$

22. Which term of $(x+2)^8$ is independent of x

(a) First (b) Second (c) Middle (d) Last

23. The series $(1+x)^n$ is valid if

(a) $x<1$ (b) $-1<x<1$ (c) $x>1$ (d) $x=1$

24. $1+x+x^2+x^3+\ldots$ is equal to

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

25. $1-x+x^2-x^3+\ldots$ is equal to

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

26. When n is negative or fraction, then general term of $(1+x)^n$ is

(a) $T_r = \frac{n(n-1)(n-2)\ldots(n-r+1)}{r!}x^r$

(b) $T_{r+1} = \frac{n(n-1)(n-2)\ldots(n-r+1)}{r!}x^r$

(c) $T_r = n(n-1)(n-2)\ldots3.2.1.\, x^r$ (d) $T_{r+1} = \binom{n}{r}x^r$

27. If $T_{r+1} = \binom{10}{r}(-2)^r(x)^{10-2r}$, The term independent of x is

(a) 10^{th} (b) 5^{th} (c) 4^{th} (d) 6^{th}

28. The sum of exponents of a and b in every term of the expansion $(a+b)^n$ is

(a) 1 (b) 0 (c) $2n$ (d) n

29. The expansion of $(1-2x)^{-2}$ is valid if

(a) $|x|<0$ (b) $|x|<\frac{1}{2}$ (c) $|x|<2$ (d) $|x|<1$

30. $n^2>n+3$ is true for:

(a) $n\geq3$ (b) $n\geq1$ (c) $n\geq2$ (d) $n\geq-1$

31. If n is odd number, then middle term in expansion $(a+x)^n$ is:

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

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

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

33. 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

34. Number of terms in the expansion of $(1+x)^n$ is:

(a) n (b) $n/2$ (c) $n-1$ (d) $n+1$

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

(a) 18 (b) 20 (c) 21 (d) 19

Chapter - 9 Multiple Choice Questions

(Encircle the correct answer choice)

1. Two rays with a common starting point form:

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

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

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

3. If the rotation of angle is counter clockwise, then angle is:

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

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

(a) 180° (b) 270° (c) 300° (d) 360°

5. One Rotation in anticlockwise direction is equal to

(a) 180° (b) 270° (c) 360° (d) 90°

6. Straight line angle is equal to

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

7. One right angle is equal to is equal to

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

8. 1° is equal to

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

9. 1° is equal to

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

10. 60^{th} part of 1° is equal to
(a) One Second (b) One minute (c) 1 Radian (d) π Radian
11. 60^{th} part of $1'$ is equal to
(a) $1'$ (b) $1''$ (c) $60''$ (d) $3600''$
12. 3600^{th} part of 1° is equal to
(a) $1'$ (b) $1''$ (c) $60''$ (d) $3600''$
13. Sexagesimal system is also called:
(a) German system (b) English system
(c) C.G.S system (d) S I system
14. $16^{\circ}30'$ is equal to
(a) 16.5° (b) $\frac{32''}{2}$ (c) 16.05° (d) 16.2^{0}
15. Conversion of 21.256° to $D^{\circ}m's''$ form is:
(a) $21^{0}, 25', 6''$ (b) $21^{0}, 40', 27''$ (c) $21^{0}, 15', 22''$ (d) $21^{0}, 30', 2''$
16. The angle subtended at the centre of the circle by an arc whose length is equal to the radius of the circle is called:
(a) 1 Degree (b) $1'$ (c) 1Radian (d) $1''$
17. The system of angular measurement in which angle is measured in radian is called:
(a) Sexagesimal system (b) Circular system
(c) English system (d) Gradient system
18. Relation between the length of an arc of a circle and the circular measure of its central angle is:
(a) $\ell = \frac{r}{\theta}$ (b) $\theta = \ell r$ (c) $\theta = \frac{\ell}{r}$ (d) $\ell = \frac{1}{2}r^2\theta$
19. With usual notations, if $\ell = 6\text{cm}$, $r = 2\text{cm}$, then unit of θ is:
(a) cm (b) cm^2 (c) No unit (d) cm^3
20. 1° is equal to
(a) $\left(\frac{\pi}{180}\right)^{\circ}$ (b) $\frac{180}{\pi}$ radian (c) $\left(\frac{180}{\pi}\right)^{\circ}$ (d) $\frac{\pi}{180}$ radian
21. 1° is equal to
(a) 0.175 rad (b) 0.0175 rad (c) 1.75 rad (d) 0.00175 rad
22. 1 Radian is equal to
(a) $\frac{\pi}{180}$ rad (b) $\frac{180}{\pi}$ rad (c) $\left(\frac{180}{\pi}\right)^{\circ}$ (d) $\left(\frac{\pi}{180}\right)^{\circ}$
23. 1 radian is equal to
(a) 57.296^{0} (b) 5.7296^{0} (c) 175.27^{0} (d) 17.5270
24. 3 radian
(a) 171.888^{0} (b) 120^{0} (c) 300^{0} (d) 270^{0}

25. $105^0 =$ ....radian

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

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

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

27. $\frac{\pi}{4}$ radian = --- deg

(a) 45^0 (b) 30^0 (c) 60^0 (d) 75^0

28. Circular measure of angle between the hands of a watch at 4-o clock are

(a) 45^0 (b) 120^0 c) $\frac{3\pi}{2}$ (d) 270^0

29. If $\ell = 1.5$ cm & $r = 2.5$ c, then θ is equal to

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

30. If $\theta = 45^0$, $r = 18$mm , then $\ell =$

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

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

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

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

(a) Acute angles (b) Allied angles
(c) Conterminal angles (d) Quad rental angle

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

(a) $\theta + 180^0 k$, $k \in Z$ (b) $\theta + 360^0 k$, $k \in Z$
(c) $\theta + 90^0 k$, k (d) None of these

34. If angle θ is in radian then angle conterminal with θ is:

(a) $\theta + 2k\pi$, $k \in Z$ (b) $\theta + k\pi$, $k \in Z$
(c) $-\theta + 2k\pi$, $k \in Z$ (d) $-(\theta + 2\pi)$

35. If the vertex lies at the origin of rectangular coordinate system and its initial side along the positive x- axis, then angle is called:

(a) Acute angle (b) Conterminal angle
(c) Angle in standard position (d) Quadrental angle

36. An angle is in standard position ,if its vertex lies

(a) at origin (b) at x-axis (c) at y -axis (d) in 1st Quadrant

37. 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 angle
(c) Allied angles (d)None of these

38. 0^0, 90^0, 180^0, 270^0 & 360^0 are:
(a) Coterminal angle (b) Quadrantal angle
(c) Allied angles (d) None of these

39. $\sin^2\theta + \cos^2\theta$ is equal to
(a) 0 (b) 1 (c) -1 (d) $\text{Sec}^2\theta$

40. $1+\tan^2\theta$ is equal to
(a) Cosec2 θ (b) $\text{Sin}^2\theta$ (c) $\sec^2\theta$ (d) $\text{Cot}^2\theta$

41. $\text{cosec}^2\theta - \cot^2\theta$ is equal to
(a) 0 (b) 1 (c) -1 (d) 2

42. If $\text{Sin}\theta < 0$ & $\cos\theta > 0$, then the terminal arm of angle lies in ... Quad.
(a) I (b) II (c) III (d) IV

43. If $\cot\theta > 0$ & $\text{cosec}\theta > 0$, then the terminal arm of angle lies in ... Quad
(a) I (b) II (c) III (d) IV

44. If $\tan\theta < 0$ & $\text{cosec}\,\theta > 0$, then the terminal arm of angle lies in ... Quad
(a) I (b) II (c) III (d) IV

45. If $\sec\theta < 0$ & $\text{Sin}\,\theta < 0$, then the terminal arm of angle lies in ... Quad
(a) I (b) II (c) III (d) IV

46. In right angle Triangle, the measure of the side opposite to 30^0 is:
(a) Half of Hypotenuse (b) Half of base
(c) Double of base (d) None of these

47. The point (0, 1) lies on terminal side of the angle:
(a) 0 (b) 90^0 (c) 180^0 (d) 270^0

48. The point $(-1, 0)$ lies on terminal side of angle:
(a) 0 (b) 90^0 (c) 180^0 (d) 270^0

49. The point $(0, -1)$ lies on terminal side of angle:
(a) 0 (b) 90^0 (c) 180^0 (d) 270^0

50. $2\sin 45^0 + \frac{1}{2}\text{cosec}45^0 =$
(a) $\sqrt{\frac{2}{3}}$ (b) $\frac{3}{\sqrt{2}}$ (c) -1 (d) 1

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

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

53. Domain of $\tan\theta =$
(a) $\theta \in R$ but but $\theta \neq n\pi$, $n \in Z$ (b) R
(c) $\theta \in R$ but $\theta \neq (2n+1)\frac{\pi}{2}$, $n \in Z$ (d) $n\pi$, $n \in Z$

54. Domain cot θ =
(a) $\theta \in R$ (b) $\theta \in R$ but $\theta \neq n\pi$, $n \in Z$
(c) $\theta \in R$ but $\theta \neq (2n+1)\frac{\pi}{2}$, $n \in Z$ (d) $R - \{0\}$

55. Domain of sec θ =
(a) $\theta \in R$ (b) $\theta \in R$ but but $\theta \neq n\pi$, $n \in Z$
(c) $R - (1,1)$ (d) $\theta \in R$ but $\theta \neq (2n+1)\frac{\pi}{2}$, $n \in Z$

56. Domain of cosec θ =
(a) $\theta \in R$ (b) $\theta \in R$ but $\theta \neq n\pi$, $n \in Z$
(c) $\theta \in R$ but $\theta \neq (2n+1)\frac{\pi}{2}$, $n \in Z$ (d) $R - [1,1]$

57. Domain of $\sin^2\theta + \cos^2\theta = 1$
(a) $\theta \in R$ (b) $\theta \in R$ but $\theta \neq n\pi$, $n \in Z$
(c) $\theta \in R$ but $\theta \neq (2n+1)\frac{\pi}{2}$, $n \in Z$ (d) $R - [1, 1]$

58. Sec θ cosec θ sin θ cos θ =
(a) 1 (b) 0 (c) sin θ (d) cos θ

59. (Sec θ + tan θ) (sec θ – tan θ) =
(a) 1 (b) $\sec^2\theta$ (c) $\tan^2\theta$ (d) $1-2\tan^2\theta$

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

61. Which of the following is not quadrental angle
(a) 90° (b) – 90° (c) –180° (d) 210°

62. Which of the following is quadrental angle
(a) 300° (b) – 90° (c) –250° (d) 210°

63. Which of the following is quadrental angle
(a) –180° (b) – 90° (c) –270° (d) All of these

Chapter - 10 Multiple Choice Questions

(*Encircle the correct answer choice*)

1. Distance between the points $P_1(x_1, y_1)$ & $P_2(x_2, y_2)$ is:
(a) $d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ (b) $d = \sqrt{(x_1 - y_1)^2 + (x_2 - y_2)^2}$
(c) $d = \sqrt{(x_1 - x_2)^2 + (y_2 - y_1)^2}$ (d) All of these

2. Distance between the points A (3, 8) & (5, 6) is:
(a) $2\sqrt{2}$ (b) 3 (c) 4 (d) $\sqrt{2}$

3. 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) $\sin\alpha\cos\beta-\cos\alpha\sin\beta$

4. $\cos(\alpha-\beta)$ is equal to
(a) $\cos\alpha.\cos\beta+\sin\alpha\sin\beta$ (b) $\cos\alpha\cos\beta-\sin\alpha\sin\beta$
(c) $\sin\alpha\cos\beta+\cos\alpha\sin\beta$ (d) $\sin\alpha\cos\beta-\cos\alpha\sin\beta$

5. $\cos(\alpha+\beta)$ is equal to
(a) $\cos\alpha.\cos\beta+\sin\alpha\sin\beta$ (b) $\cos\alpha\cos\beta-\sin\alpha\sin\beta$
(c) $\sin\alpha\cos\beta+\cos\alpha\sin\beta$ (d) $\sin\alpha\cos\beta-\cos\alpha\sin\beta$

6. $\sin(\alpha-\beta)$ 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) $\sin\alpha\cos\beta-\cos\alpha\sin\beta$

7. $\sin(\alpha+\beta)$ 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) $\sin\alpha\cos\beta-\cos\alpha\sin\beta$

8. $\cos(\frac{\pi}{2}-\beta))$ is equal to
(a) $\text{Cos}\,\beta$ (b) $-\cos\beta$ (c) $\sin\beta$ (d) $-\sin\beta$

9. $\cos(\beta+\frac{\pi}{2})$ is equal to
(a) $\text{Cos}\,\beta$ (b) $-\cos\beta$ (c) $\text{Sin}\,\beta$ (d) $-\sin\beta$

10. $\sin(\beta-\frac{\pi}{2})$ is equal to
(a) $\text{Cos}\,\beta$ (b) $-\cos\beta$ (c) $\sin\beta$ (d) $-\sin\beta$

11. $\cos(2\pi-\theta)$ is equal to
(a) $\text{Cos}\,\theta$ (b) $-\text{Cos}\,\theta$ (c) $\text{Sin}\,\theta$ (d) $-\sin\theta$

12. $\sin(2\pi-\theta)$ is equal to.
(a) $\text{Cos}\,\theta$ (b) $-\text{Cos}\,\theta$ (c) $\text{Sin}\,\theta$ (d) $-\sin\theta$

13. $\text{Tan}(\alpha+\beta)$ is equal to
(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) $\frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta}$

14. $\text{Tan}(\alpha-\beta)$ is equal to
(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) $\frac{\tan\alpha+\tan\beta}{1+\tan\alpha\tan\beta}$

15. Angles associated with basic angles of measure θ to a right angle or its multiple are called:
(a) Conterminal angles (b) Angle in standard positions
(c) Allied angles (d) Obtuse angles

16. $\sin(\frac{\pi}{2}-\theta)$ is equal to
(a) Cos θ (b) Sin θ (c) –cos θ (d) $-\sin\theta$

17. $\sin(\frac{\pi}{2}+\theta)$ is equal to
(a) Cos θ (b) Sin θ (c) –cos θ (d) $-\sin\theta$

18. $\cos(\frac{\pi}{2}-\theta)$ is equal to
(a) cos θ (b) sin θ (c) –cos θ (d) $-\sin\theta$

19. $\cos(\frac{\pi}{2}+\theta)$ is equal to
(a) cos θ (b) sin θ (c) –cos θ (d) $-\sin\theta$

20. $\tan(\frac{\pi}{2}-\theta)$ is equal to
(a) cot θ (b) tan θ (c) – cot θ (d) –tan θ

21. $\tan(\frac{\pi}{2}+\theta)$ is equal to
(a) cot θ (b) tan θ (c) – cot θ (d) –tan θ

22. sin (π – θ) is equal to
(a) sin θ (b) cosθ (c) – sin θ (d) $-\cos\theta$

23. sin(π + θ) is equal to
(a) sin θ (b) cosθ (c) – sin θ (d) $-\cos\theta$

24. cos (π – θ) is equal to
(a) sin θ (b) cosθ (c) – sin θ (d) $-\cos\theta$

25. cos (π + θ) is equal to
(a) sin θ (b) cosθ (c) – sin θ (d) $-\cos\theta$

26. tan (π – θ) is equal to
(a) tan θ (b) – cot θ (c) $-\tan\theta$ (d) cot θ

27. tan (π+ θ) is equal to
(a) tan θ (b) – cot θ (c) $-\tan\theta$ (d) cot θ

28. $\sin(\frac{3\pi}{2}-\theta)$ is equal to
(a) Sinθ (b) cos θ (c) $\sin\theta$ (d) – cos θ

29. $\sin(\frac{3\pi}{2}+\theta)$ is equal to
(a) Sinθ (b) cos θ (c) $\sin\theta$ (d) – cos θ

30. $\cos\left(\frac{3\pi}{2}+\theta\right)$ is equal to

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

31. $\cos\left(\frac{3\pi}{2}-\theta\right)$ is equal to

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

32. $\tan\left(\frac{3\pi}{2}+\theta\right)$ is equal to

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

33. $\tan\left(\frac{3\pi}{2}-\theta\right)$ is equal to

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

34 $\sin(2\pi-\theta)$ is equal to

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

35. $\sin(2\pi+\theta)$ is equal to

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

36. $\cos(2\pi+\theta)$ is equal to

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

37. $\tan(2\pi-\theta)$ is equal to

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

38. $\tan(2\pi+\theta)$ is equal to

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

39. $\cos 315^0$ is equal to

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

40. $\sin 540^0$ is equal to

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

41. $\tan(-135)$ is equal to

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

42. $\sec(-300^0)$ is equal to

(a) 1 (b) 2 (c) 0 (d) -1

43. $\sin(180+\alpha).\sin(90-\alpha)$ is equal to

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

44. If α, β and γ are the angles of Δ ABC, then $\sin(\alpha+\beta)$ is equal to

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

45. If α, β and γ are the angles of Δ ABC, then $\cos\frac{(\alpha+\beta)}{2} =$

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

46. If α, β and γ are the angles of Δ ABC, then cos (α + β) is equal to

(a) sin γ (b) – sin γ (c) cos γ (d) – cos γ

47. $\frac{\cos 11^0 + \sin 11^0}{\cos 11^0 - \sin 11^0} =$

(a) tan 56^0 (b) tan 34^0 (c) cot 56^0 (d) cot 34^0

48. sin2α is equal to

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

49. cos 2α is equal to

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

50. tan 2 α is equal to

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

51. $\cos\frac{\alpha}{2} =$

(a) $\pm\sqrt{\frac{1+\sin\alpha}{2}}$ (b) $\pm\sqrt{\frac{1-\cos\alpha}{2}}$ (c) $\pm\sqrt{\frac{1+\cos\alpha}{2}}$ (d) $\pm\sqrt{\frac{1-\sin\alpha}{2}}$

52. $\sin\frac{\alpha}{2}$ is equal to

(a) $\pm\sqrt{\frac{1+\sin\alpha}{2}}$ (b) $\pm\sqrt{\frac{1-\cos\alpha}{2}}$ (c) $\pm\sqrt{\frac{1+\cos\alpha}{2}}$ (d) $\pm\sqrt{\frac{1-\sin\alpha}{2}}$

53. sin3α is equal to

(a) 3 Sin α $-4\sin^3\alpha$ (b) 3 Sin α + $4\sin^3\alpha$
(c) 4 Sin α – 3 $\sin^3\alpha$ (d) 4 Sin α + 3 $\sin^3\alpha$

54. cos3 α is equal to

(a) 3cos α – 4cos α (b) $3\cos^3\alpha + 4\cos\alpha$
(c) $4\cos^3\alpha - 3\cos\alpha$ (d) $4\cos^3\alpha + 4\cos\alpha$

55. $\frac{1-\cos\alpha}{\sin\alpha} =$

(a) $\tan\frac{\alpha}{2}$ (b) $\cos\frac{\alpha}{2}$ (c) $\sin\frac{\alpha}{2}$ (d) $\sec\frac{\alpha}{2}$

56. ($\sin \alpha + \sin \beta$) is equal to

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

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

57. $\sin \alpha - \sin \beta =$

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

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

58. $\cos \alpha + \cos \beta =$

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

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

59. $\cos \alpha - \cos \beta =$

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

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

60. $2 \sin 7\theta \cos 3\theta =$

(a) $\sin 10\theta + \sin 4\theta$ (b) $\sin 5\theta + \sin 2\theta$

(c) $\cos 10\theta + \cos 4\theta$ (d) $\cos 5\theta - \cos 2\theta$

61. $2 \cos 5\theta \sin 3\theta$ is equal to

(a) $\sin 8\theta - \sin 2\theta$ (b) $\sin 8\theta + \sin 2\theta$

(c) $\sin 4\theta - \sin \theta$ (d) $\sin 4\theta + \sin \theta$

62. $2 \sin 7\theta \sin 2\theta$ is equal to

(a) $\cos 5\theta - \cos 9\theta$ (b) $\cos 9\theta - \cos 5\theta$

(c) $\sin 9\theta + \sin 5\theta$ (d) $\sin 9\theta + \sin 5\theta$

63. $\sin 12^0 \sin 46^0$ is equal to

(a) $\frac{1}{2}(\cos 34^0 - \cos 58^0)$ (b) $\frac{1}{2}(\cos 58^0 - \cos 34^0)$

(c) $(\cos 58^0 - \cos 34^0)$ (d) $\frac{1}{2}(\cos 58^0 + \cos 34^0)$

64. Which is the allied angle:

(a) $90^o + \theta$ (b) $60^o + \theta$ (c) $45^o + \theta$ (d) $30^o + \theta$

65. The value of $\sin 420^o$ is:

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

66. 2 sinx cosx is equal to:
(a) sinx (b) sin2x (c) sin x/2 cos x/2 (d) none of these

67. The value of $\cos(\alpha - 2\pi)$ is equal to:
(a) $-\cos\alpha$ (b) $-\sin\alpha$ (c) $\cos\alpha$ (d) $\sin\alpha$

68. The value of $\sin 7\pi$ is equal to:
(a) 0 (b) 1 (c) –1 (d) 1/2

Chapter - 11 Multiple Choice Questions

Encircle the correct answer choice)

1. Domain of $y = \sin x$ is
(a) $-x < x < x$ (b) $-1 \le x \le 1$
(c) $-\infty < x < \infty, x \ne n\pi, n \in Z$ (d) $x \ge 1, x \le -1$

2. Domain of $y = \cos x$ is
(a) $-\infty < x < \infty$ (b) $-1 \le x \le 1$
(c) $-\infty < x < \infty, x \ne n\pi, n \in Z$ (d) $x \ge 1, x \le -1$

3. Domain of $y = \text{Tan } x$ is
(a) $-\infty < x < \infty$ (b) $-\infty < x < \infty, x \ne n\pi, n \in Z$
(c) $-\infty < x < \infty, x \ne \frac{(2n+1)\pi}{2}, n \in Z$ (d) $-\pi \le x \le \pi$

4. Domain of $y = \cot x$ is
(a) $-\infty < x < \infty$ (b) $-\infty < x < \infty, x \ne n\pi, n \in Z$
(c) $-\infty < x < \infty, x \ne \frac{(2n+1)\pi}{2}, n \in Z$ (d) $-\pi \le x \le \pi$

5. Domain of $y = \sec x$ is
(a) $-\infty < x < \infty$ (b) $-\infty < x < \infty, x \ne n\pi, n \in Z$
(c) $-\infty < x < \infty, x \ne \frac{(2n+1)\pi}{2}, n \in Z$ (d) $-\pi \le x \le \pi$

6. Domain of $y = \text{cosec } x$ is
(a) $-\infty < x < \infty$ (b) $-\infty < x < \infty, x \ne n\pi, n \in Z$
(c) $-\infty < x < \infty, x \ne \frac{(2n+1)\pi}{2}, n \in Z$ (d) $-\pi \le x \le \pi$

7. Range of $y = \sin x$ is
(a) R (b) $-1 \le y \le 1$ (c) $(-\infty, 1) \cup (1, \infty)$ (d) $-1 < y < 1$

8. Range of $y = \cos x$ is
(a) R (b) $[-1, 1]$ (c) $-1 < y < 1$ (d) $(-\infty, 1) \cup (1, \infty)$

9 Range of $y = \tan x$ is
(a) $(-\infty, \infty)$ (b) $[-1, 1]$ (c) Q (d) $R - \{0\}$

10. Range of $y = \cot x$ is
(a) R (b) $R - [-1, 1]$ (c) $R - \{0\}$ (d) Z

11. Range of $y = \sec x$ is
(a) R (b) $y = \geq 1$or $y \leq -1$
(c) $-1 \leq y \leq 1$ (d) $R - [-1,1]$

12. Range of $y =$ Cosec x is
(a) R (b) $y = \geq 1$or $y \leq -1$
(c) $-1 \leq y \leq 1$ (d) $R - [-1,1]$

13. Smallest + ve number which when added to the original circular measure of the angle gives the same value of the function is called
(a) Domain (b) Range (c) co domain (d) period

14. Period of $\sin\theta$ is
(a) π (b) 2π (c) -2π (d) $\frac{\pi}{2}$

15. Period of cosec θ is
(a) π (b) 2π (c) -2π (d) $\frac{3\pi}{2}$

16. Period of $\tan\theta$ is
(a) π (b) 2π (c) -2π (d) $\frac{3\pi}{2}$

17. Period of $\cot\theta$ is
(a) π (b) 2π (c) -2π (d) $\frac{3\pi}{2}$

18. Period of $\sec\theta$ is
(a) π (b) 2π (c) -2π (d) $\frac{3\pi}{2}$

19. Period of $\cos\theta$ is
(a) π (b) 2π (c) -2π (d) $\frac{3\pi}{2}$

20. period of $\sin 3x$ is
(a) π (b) 2π (c) $\frac{2\pi}{3}$ (d) 6π

21. Period of $\cos 2x$ is
(a) 2π (b) π (c) 4π (d) $\frac{\pi}{2}$

22. Period of $\tan 4x$
(a) $\frac{\pi}{4}$ (b) 4π (c) 8π (d) $\frac{\pi}{2}$

23. Period of $\cot 3x$ is
(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{3}$ (c) $\frac{2\pi}{3}$ (d) 3π

24. Period of sec $2x$ is

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

25. Period of cosec $3x$ is

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

26. Period of $\sin\frac{x}{3}$ is

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

27. Period of $\cos\frac{x}{6}$ is

(a) 12π (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{6}$ (d) 3π

28. Period of $\cot\frac{x}{2}$

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

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

(a) $\frac{10\pi}{3}$ (b) $\frac{6\pi}{5}$ (c) 10π (d) $\frac{5\pi}{3}$

30. Period of $2\,\text{cosec}\,\frac{x}{4}$ is

(a) 2π (b) 4π (c) $\frac{\pi}{2}$ (d) 8π

31. Period of $3\tan\frac{x}{7}$ is

(a) $\frac{7\pi}{3}$ (b) 7π (c) $\frac{14\pi}{3}$ (d) 14π

32. The graph of trigonometric functions have
(a) Breaks segments (b) sharp corners
(c) straight line segments (d) smooth curves

33. The graph of function $y = \sin 2x$, will be between the lines
(a) $x = 1$ & $x = -1$ (b) $y = 1$ & $y = -1$
(c) $x = 2$ & $x = -2$ (d) $y = 2$ & $y = -2$

34. The graph of sine function in the interval $[0, 2\pi]$ is called
(a) its period (b) its domain (c) its continuity (d) one cycle

35. The graph of function $y = 2\sin x$, will be between the lines
(a) $x = 1$ & $x = -1$ (b) $y = 1$ & $y = -1$
(c) $x = 2$ & $x = -2$ (d) $y = 2$ & $y = -2$

36. The trigonometric functions repeat their values after adding or subtracting 2π in basic angle x. This behavior is called
(a) period (b) periodicity (c) continuity (d) range

Chapter - 12 Multiple Choice Questions

(Encircle the correct answer choice)

1. A "Triangle" has:
(a) Two elements (b) 3 Elements
(c) 4 Elements (d) 6 Elements

2. At the top of a cliff 80m high the angle of depression of a boat is α, If the distance between the boat and foot of clif is $80\sqrt{3}$ m, then angle α is
(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{6}$ (c) $\frac{\pi}{3}$ (d) $\frac{3\pi}{4}$

3. When we look an object above the horizontal ray, the angle formed is
(a) Angle of Elevation (b) Angle of depression
(c) Angle of incidence (d) Angle of reflection

4. When we look an object below the horizontal ray, the angle formed is
(a) Angle of Elevation (b) Angle of depression
(c) Angle of incidence (d) Angle of reflection

5. A Triangle which is not right is called:
(a) Oblique triangle (b) Isosceles triangle
(c) Scalene triangle (d) Right Isosceles triangle

6. To solve an oblique triangle, we use:
(a) Law of sines (b) Law of cosines
(c) Law of tangents (d) All of these

7. In any triangle ABC, $\frac{b^2+c^2-a^2}{2bc}=$
(a) Cos α (b) Sin α (c) Cos β (d) Cos γ

8. Which can be reduced to Pythagoras theorem:
(a) Law of sines (b) Law of cosines
(c) Law of tangents (d)Half angle formulas

9. In any triangle ABC, if $\beta = 90^0$,then $b^2 = c^2+a^2-2ac\cos\beta$ becomes:
(a) Law of sin (b) Law of Tangents
(c) Pythagoras Theorem (d) None of these

10. In any triangle ABC, Law of of tangent is:
(a) $\frac{a-b}{a+b}=\frac{\tan(\alpha-\beta)}{\tan(\alpha+\beta)}$ (b) $\frac{a-b}{a+b}=\frac{\tan(\alpha+\beta)}{\tan(\alpha-\beta)}$
(c) $\frac{a-b}{a+b}=\frac{\tan(\frac{\alpha-\beta}{2})}{\tan(\frac{\alpha+\beta}{2})}$ (d) $\frac{a-b}{a+b}=\frac{\tan(\frac{\alpha+\beta}{2})}{\tan(\frac{\alpha-\beta}{2})}$

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

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

12. In any triangle ABC, $\sqrt{\dfrac{(s-a)(s-c)}{ac}}$ is equal to

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

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

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

14. In any triangle ABC, $\text{Cos}\dfrac{\alpha}{2}$ is equal to

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

15. In any triangle ABC, $\text{Cos}\dfrac{\beta}{2}$ is equal to

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

16. In any triangle ABC, $\text{Cos}\dfrac{\gamma}{2}$ is equal to

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

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

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

18. $\sqrt{\dfrac{s(s-a)}{(s-b)(s-c)}} =$

(a) $\sin\dfrac{\alpha}{2}$ (b) $\cos\dfrac{\alpha}{2}$ (c) $\tan\dfrac{\alpha}{2}$ (d) $\cot\dfrac{\alpha}{2}$

19. $\sqrt{\dfrac{s(s-b)}{(s-a)(s-c)}} =$

(a) $\sin\dfrac{\beta}{2}$ (b) $\cos\dfrac{\beta}{2}$ (c) $\tan\dfrac{\beta}{2}$ (d) $\cot\dfrac{\beta}{2}$

20. In any triangle ABC, $\sqrt{\dfrac{s(s-c)}{(s-a)(s-b)}}$ is equal to

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

21. In any triangle ABC, $\sqrt{\dfrac{(s-a)(s-b)}{s(s-c)}}$ is equal to

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

22. In any triangle ABC, $\sqrt{\dfrac{(s-a)(s-c)}{s(s-b)}}$

(a) $\tan\dfrac{\beta}{2}$ (b) $\tan\dfrac{\gamma}{2}$ (c) $\tan\dfrac{\gamma}{2}$ (d) $\sec\dfrac{\gamma}{2}$

23. In any triangle ABC, $\sqrt{\dfrac{(s+a)(s+b)}{s(s+c)}} =$

(a) $\sin\dfrac{\gamma}{2}$ (b) $\cos\dfrac{\gamma}{2}$ (c) $\tan\dfrac{\gamma}{2}$ (d) None of these

24. We can solve an oblique triangle, if:
(a) One side and two angles are known (b)Three sides are known
(c) Two sides and their included angles are known (d)All (a),(b) and (c)

25. To solve an oblique Triangle when measure of three sides are given, we can use:
(a) Hero Formula (b) Law of Cosines
(c) Law of Tangents (d) Pythagoras theorem

26. The smallest angle of Δ ABC, when a = 37.34, b=3.24, and c = 35.06 is
(a) α (b) β (c) γ (d) cannot be determined

27. Area of Triangle in terms of measure of two sides and their included angle is:

(a) $\dfrac{1}{2}bc\sin\alpha$ (b) $\dfrac{1}{2}ca\sin\beta$ (c) $\dfrac{1}{2}ab\sin\gamma$ (d) All of these

28. In any triangle ABC, Area of Triangle is:

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

29. Area of Triangle in terms of measure of one side and two angles is:

(a) $\dfrac{1}{2}\dfrac{a^2\sin\beta\sin\gamma}{\sin\alpha}$ (b) $\dfrac{1}{2}\dfrac{b^2\sin\alpha\sin\gamma}{\sin\beta}$

(c) $\dfrac{1}{2}\dfrac{c^2\sin\alpha\sin\beta}{\sin\gamma}$ (d) All of these

30. In any triangle ABC, Hero's formula is

(a) $\Delta = s\ (s\quad a)\ (s\quad b)\ (s\quad c)$ (b) $\Delta = \sqrt{(s-a)(s-b)(s-c)}$

(c) $\Delta = \sqrt{s(s-a)(s-b)(s-c)}$ (d) $\Delta = \dfrac{a+b+c}{2}$

31. In any triangle ABC, with usual notations, which one of them is not true

(a) $\Delta = \dfrac{1}{2}ab\sin\gamma$ (b) $\Delta = \dfrac{1}{2}bc\sin\alpha$

(c) $\Delta = \dfrac{1}{2}\dfrac{a\sin\beta\sin\gamma}{\sin\alpha}$ (d) $\Delta^2 = s\ (s\quad a)\ (s\quad b)\ (s\quad c)$

32. The circle passing through the three vertices of a Trianlge is called

(a) Circum Circle (b) In-circle (c) Ex- centre (d) Escribed circle

33. The point of intersection of the right bisectors of the sides of the Trianlge is called:

(a)circum centre (b)In centre

(c)Escribed centre (d)ortho centre

34. Radius of the circle which passes through the vertices of a Triangle is:

(a) Circum Radius (b) In-Radius

(c) e- Radius (d) Diameter

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

(a) r (b) r_1 (c) R (d) Δ

36. . In any triangle ABC, with usual notations, $\dfrac{b}{\sin\beta} =$

(a) 2 r (b) 2 r_1 (c) 2R (d) ΔS

37. In any triangle ABC, with usual notations, $\text{Sin}\,\gamma =$

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

38. . In any triangle ABC, with usual notations, $R =$

(a) $\dfrac{abc}{\Delta}$ (b) $\dfrac{abc}{4\Delta}$ (c) $\dfrac{4\Delta}{abc}$ (d) $\dfrac{\Delta}{abc}$

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

(a) R (b) Rs (c) 4RΔ (d) $\dfrac{\Delta}{s}$

40. The circle drawn inside a Triangle touching its three sides internally is

(a) Inscribed circle (b) unit circle

(c) circum circle (d) Escribed circle

41. The point of intersection of the bisectors of angles of the Triangle is:

(a) In centre (b) e-centre

(c) circum centre (d) Ex - centre

42. In Radius is denoted by
(a) R (b) r (c) r_1 (d) s

43. In any triangle ABC, with usual notations, in radius r is equal to
(a) $\frac{s}{\Delta}$ (b) $\frac{\Delta}{s}$ (c) s Δ (d) $\frac{a}{2\sin\alpha}$

44. A circle which touches one side of the Triangle externally and other two produced sides internally is
(a) Escribed circle (b) Ex-circle (c) e-circle (d) all of these

45. The point where the internal bisector of one and the external bisector of the other two angles of the Triangle meet is called:
(a) Escribed centre (b) Ex- centre (c) e-centre (d) all of these

46. In any triangle ABC, with usual notations, $\frac{\Delta}{s-a}$:
(a) R (b) r (c) r_1 (d) Sin α

47. In any triangle ABC, with usual notations, r_3 is equal to
(a) $\frac{\Delta}{s-a}$ (b) $\frac{\Delta}{s-b}$ (c) $\frac{\Delta}{s-c}$ (d) $\frac{s-a}{\Delta}$

48. In any triangle ABC, with usual notations, $r : R : r_1$
(a) 1: 2: 3 (b) 3: 2: 1 (c) 1:3: 2 (d) 1:1: 1

49. In any triangle ABC, with usual notations, Law of Sine is:
(a) $\frac{\sin\alpha}{a} = \frac{\sin\beta}{b} = \frac{\sin\gamma}{c}$ (b) $\frac{a}{\sin\alpha} = \frac{b}{\sin\beta} = \frac{c}{\sin\gamma}$
(c) $a : \sin\alpha = b : \sin\beta = c : \sin\gamma$ (d) All of these

50. The area of triangle ABC is
(a) $\frac{1}{2}bc\sin\beta$ (b) $\frac{1}{2}bc\sin\gamma$ (c) $\frac{1}{2}bc\sin\alpha$ (d) $\frac{1}{2}bc\sin(\alpha+\beta+\gamma)$

51. For a circum circle, R =
(a) $\frac{abc}{4\Delta}$ (b) $\frac{a}{4s\Delta}$ (c) $\frac{abc}{\Delta}$ (d) $\frac{4\Delta}{abc}$

52. In a triangle ABC if $\beta = 60^\circ$, $\gamma = 15^\circ$, then α equals:
(a) 90° (b) 180° (c) 150° (d) 105°

53. With usual notation r_3 equals
(a) $\frac{\Delta}{s-a}$ (b) $\frac{\Delta}{s-b}$ (c) $\frac{\Delta}{s-c}$ (d) $\frac{\Delta}{s+a}$

54. With usual notations, $\frac{\Delta}{s-a}$ is equal to:
(a) r (b) r_1 (c) r_2 (d) r_3

55. With usual notation r_2 is equal to:
(a) $\frac{\Delta}{s-b}$ (b) $\frac{\Delta}{s}$ (c) $\frac{s-b}{\Delta}$ (d) $\frac{s}{\Delta}$

Chapter - 13 Multiple Choice Questions

(Encircle the correct answer choice)

Note: Here we are dealing with principal function or capital function i.e.

1. Instead of sin x, we use Sin x.
   Instead of cos x, we use Cos x
   Instead of tan x we use Tan x etc. While in chapter 11, General functions were discussed and symbols $\sin x$, $\tan x$ etc. were used.
2. Here we are restricting the domain to make the function (1-1), so that its inverse is to be calculated.
3. Inverse of general Trigonometric functions does not exist. It exists only when function is (1-1), to make the function (1-1), we restrict the domain of the function and we call the function principal or capital functions. We denote the principal functions as:
   $y = \text{Sin } x$, $y = \text{Cos } x$, $y = \text{See } x$
   $y = \text{Cosec } x$, $y = \text{Tan } x$, $y = \text{Cot } x$

1. If $y = \text{Sin } x$, then Domain is

(a) $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$ (b) $0 \le x \le \pi$

(c) $[0, \pi]$, $x \ne \frac{\pi}{2}$ (d) $[-\frac{\pi}{2}, \frac{\pi}{2}]$, $x \ne 0$

2. If $y = \text{Cos } x$, then Domain is

(a) $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$ (b) $0 \le x \le \pi$

(c) $[0, \pi]$, $x \ne \frac{\pi}{2}$ (d) $[-\frac{\pi}{2}, \frac{\pi}{2}]$, $x \ne 0$

3. If $y = \text{Sec } x$, then Domain is

(a) $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$ (b) $0 \le x \le \pi$

(c) $[0, \pi]$, $x \ne \frac{\pi}{2}$ (d) $[-\frac{\pi}{2}, \frac{\pi}{2}]$, $x \ne 0$

4. If $y = \text{Cosec } x$, then Domain is

(a) $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$ (b) $0 \le x \le \pi$

(c) $[0, \pi]$, $x \ne \frac{\pi}{2}$ (d) $[-\frac{\pi}{2}, \frac{\pi}{2}]$, $x \ne 0$

5. If $y =$ Tan x, then domain is

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

6. If $y =$ Cot x, then domain is

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

7. If $y =$ Sin x, then range is

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

8. If $y =$ Cos x, then range is

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

9. If $y =$ Tan x, Then range is

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

10. If, $y =$ Cot x, then range is

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

11. If $y =$ Cosec x, then range is

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

12. If $y =$ Sec x, then range is

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

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

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

14. If $y = \text{Cos}^{-1}x$, then Domain is

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

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

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

16. If. $y = \text{Cot}^{-1}x$, then Domain is

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

17. If $y = \text{See}^{-1}x$, then Domain is

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

18. If $y = \text{Cosec}^{-1}x$, then Domain is

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

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

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

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

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

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

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

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

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

23. If $y = \text{See}^{-1}x$, then range is

(a) $0 \le y \le \pi,\ y \ne \frac{\pi}{2}$ (b) $-\frac{\pi}{2} \le y \le \frac{\pi}{2},\ y \ne 0$

(c) $0 < y < \pi$ (d) $-\frac{\pi}{2} < y < \frac{\pi}{2}$

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

(a) $0 \le y \le \pi,\ y \ne \frac{\pi}{2}$ (b) $-\frac{\pi}{2} \le y \le \frac{\pi}{2},\ y \ne 0$

(c) $0 < y < \pi$ (d) $-\frac{\pi}{2} < y < \frac{\pi}{2}$

25. Inverse of a function exist only if it is

(a) trigonometric function (b) (1-1) function
(c) onto function (d) an into function

26. If $y = \text{Sin}^{-1}x$, then which is not true

(a) $x = \text{Sin}\, y$ (b) domain of Inverse function is value of x
(c) $y = (\text{Sin})^{-1}$ (d) range of Inverse function is value of y

27. $\text{Sin}^{-1}x =$

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

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

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

29. $\text{Cosec}^{-1}x =$ ....

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

30. $\mathrm{Sec}^{-1}x =$

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

31. $\mathrm{Tan}^{-1}x =$

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

32. $\mathrm{Cot}^{-1}x =$ ....

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

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

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

34. $\mathrm{Cos}(\mathrm{Tan}^{-1}0) =$ ....

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

35. $\mathrm{Sec}\left[\mathrm{Sin}^{-1}\left(-\frac{1}{2}\right)\right] =$ ....

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

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

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

37. $\mathrm{Cos}^{-1}\left(\frac{1}{2}\right) =$ ....

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

38. $\mathrm{Tan}^{-1}\left(-\frac{1}{3}\right) =$ ....

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

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

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

40. $\text{Cot}^{-1}(-1) =$

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

41. $\text{Tan Tan}^{-1}(-1) =$

(a) -1 (b) 1 (c) $\frac{\pi}{4}$ (d) $-\frac{\pi}{4}$

42. $\text{Cos}(\text{Sin}^{-1}\frac{1}{\sqrt{2}}) =$

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

43. $\text{Sec}(\text{Cos}^{-1}\frac{1}{2}) =$

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

44. $\text{Tan Cos}^{-1}\frac{\sqrt{3}}{2} =$

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

45. $\text{Cosec}(\text{Tan}^{-1}(-1)) =$ ....

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

46. $\text{Sin}(\text{Sin}^{-1}\frac{1}{2}) =$ ......

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

47. $\text{Tan}(\text{Sin}^{-1}(-\frac{1}{2})) =$ ....

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

48. $\text{Sin}^{-1}A + \text{Sin}^{-1}B$ is equal to

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

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

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

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

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

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

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

52. $\text{Tan}^{-1} A + \text{Tan}^{-1} B =$

(a) $\text{Tan}^{-1}(\frac{A-B}{1+AB})$ (b) $\text{Tan}^{-1}(\frac{A+B}{1-AB})$

(c) $\text{Tan}^{-1}(\frac{A-B}{1-AB})$ (d) $\text{Tan}^{-1}(\frac{A+B}{1+AB})$

53. $\text{Tan}^{-1} A - \text{Tan}^{-1} B =$

(a) $\text{Tan}^{-1}(\frac{A-B}{1+AB})$ (b) $\text{Tan}^{-1}(\frac{A+B}{1-AB})$

(c) $\text{Tan}^{-1}(\frac{A-B}{1-AB})$ (d) $\text{Tan}^{-1}(\frac{A+B}{1+AB})$

54. $2\,\text{Tan}^{-1} A =$

(a) $\text{Tan}^{-1}(\frac{A}{1-A^2})$ (b) $\text{Tan}^{-1}(\frac{2A}{1-A})$

(c) $\text{Tan}^{-1}(\frac{2A}{1+A^2})$ (d) $\text{Tan}^{-1}(\frac{A}{1+A^2})$

55. $\text{Sin}^{-1}(-x) = \ldots\ldots\ldots$

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

56. $\text{Cos}^{-1}(-x)$

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

57. $\text{Tan}^{-1}(-x) = \ldots\ldots\ldots$

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

58. $2\,\text{Sin}^{-1} A = \ldots\ldots\ldots$

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

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

59. $2\,\text{Cos}^{-1} A =$

(a) $\text{Cos}^{-1}(2A^2-1)$ (b) $\text{Cos}^{-1}(1-2A^2)$

(c) $\text{Cos}^{-1}(2A-1)$ (d) $\text{Cos}^{-1}(2A^2+1)$

60. $\text{Cosec}^{-1}(-x) = \ldots\ldots\ldots$

(a) $-\text{Cosec}^{-1} x$ (b) $\text{Sin}^{-1} x$

(c) $\pi - \text{Cosec}^{-1} x$ (d) $\pi - \text{Sin}^{-1} x$

61. $Sec^{-1}(-x)$
(a) $Cos^{-1}x$ (b) $Sec^{-1}x$ (c) $\pi - Sec^{-1}x$ (d) $-Sec^{-1}x$

62. $Cot^{-1}(-x)$ = ...
(a) $-Cot^{-1}x$ (b) $\pi - tan^{-1}x$ (c) $\pi - cot^{-1}x$ (d) $Tan^{-1}x$

63. $Tan\left(\cos^{-1}\frac{\sqrt{3}}{2}\right) =$

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

64. $Tan^{-1}\left[\frac{2A}{1-A^2}\right]$ is equal to:

(a) $Tan^{-1}A$ (b) $Tan^{-1}\left(\frac{2}{A}\right)$ (c) $2Tan^{-1}A$ (d) $Tan^{-1}\left(\frac{A}{2}\right)$

65. $Tan^{-1}(2A) =$
(a) $Tan^{-1}\left(\frac{A}{2}\right)$ (b) $Tan^{-1}\left(\frac{2}{A}\right)$ (c) $2Tan^{-1}A$ (d) Non of these

Chapter - 14 Multiple Choice Questions

(Encircle the correct answer choice)

1. An equation containing at least one trigonometric function is called:
(a) Trigonometric function (b) Trigonometric equation
(c) Trigonometric value (d) Periodic equation

2. If $\text{Sin } x = \frac{1}{2}$, then solution in the interval $[0, 2\pi]$ is:
(a) $\{\frac{\pi}{6}, \frac{5\pi}{6}\}$ (b) $\{\frac{\pi}{6}, \frac{7\pi}{6}\}$ (c) $\{\frac{\pi}{3}, \frac{4\pi}{3}\}$ (d) $\{\frac{\pi}{3}, \frac{2\pi}{3}\}$

3. If $\text{Cos } x = \frac{1}{2}$, then reference angle is:
(a) $\frac{\pi}{3}$ (b) $-\frac{\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $-\frac{\pi}{6}$

4. If $\text{Sin } x = -\frac{1}{2}$, then reference angle is:
(a) $\frac{\pi}{3}$ (b) $-\frac{\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $-\frac{\pi}{6}$

5. General Solution of tan $x = 1$ is:

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

(c) $\{\frac{\pi}{4} + n\pi, \frac{3\pi}{4}\ n\pi\}$ (d) $\{\frac{\pi}{4} + 2n\pi, \frac{3\pi}{4} + 2n\pi\}$, $n \in Z$

6. 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) $\frac{3\pi}{4}$

7. If $\sin x + \cos x = 0$, 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) $\{\frac{\pi}{4}, \frac{-\pi}{4}\}$

8. If $\sin 2x = \frac{\sqrt{3}}{2}$, then $x \in [0, \pi]$ is

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

9. General solution of the equation $1 + \cos x = 0$ is:

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

(c) $\{-\pi + n\pi\}$ (d) non

10. General solution of $4\sin x - 8 = 0$ is:

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

(c) $\{-\pi + n\pi\}$ (d) not possible

11. If $\sin x = \cos x$, then value of x is:

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

12 If $\cot\theta = \frac{1}{\sqrt{3}}$, then value of θ in $[0, \pi]$ is:

(a) $\frac{\pi}{3}$ (b) $\frac{\pi}{6}$ (c) $\{\frac{\pi}{3}, \frac{\pi}{6}\}$ (d) Non

13 Solution of equation $2\sin x + \sqrt{3} = 0$ in 4th Quadrant is:

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

14. If $\sin x = \cos x$, then General solution is:

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

(c) $\{\frac{\pi}{4} + n\pi, \frac{5\pi}{4} + n\pi, n \in Z\}$ (d) $\{\frac{\pi}{4} + 2n\pi, \frac{5\pi}{4} + 2n\pi, n \in Z\}$

15. If $\cos^2 x = \frac{1}{2}$, then value of x in $[0, 2\pi]$ are:

(a) $\{\frac{2\pi}{3}, \frac{4\pi}{3}\}$ (b) $\{\frac{\pi}{3}, \frac{\pi}{6}\}$

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

16. If $4 \sin^2 x = 3$, then value of x in $[0, \pi]$ is:

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

17. 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

18. All trigonometric function are .... function

(a) periodic (b) continues (c) injective (d) bijective

19. General solution of every trigonometric equation consists of:

(a) one solution only (b) two solutions

(c) infinity many solutions (d) No real solution

20. If $\sin 2x = \cos x$, then values of x in $[0,\pi]$ are:

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

21 If $\sin x = 0$, then solution set is:

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

22. If $\sin = 1$, then solution set is:

(a) $\{\frac{\pi}{2}\}$ (b) $\{\frac{\pi}{2} + n\pi, \frac{3\pi}{2} + n\pi, n \in Z\}$

(c) $\{\frac{\pi}{2} + 2n\pi\}$ (d) $\{n\pi, n \in Z\}$

23. If $\cos x = 1$, then solution set is:

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

24. If $\cos x = 0$, then solution set is:

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

25. If $\tan x = 0$, then solution set is:

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

26. If $\cot x = 0$, then solution set is:

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

27. If cosec x =1, then solution set is:

(a) $\{-\frac{\pi}{2}\}$ (b) $\{\frac{3\pi}{2}\}$ (c) $\{\frac{\pi}{2}+2n\pi, n\in Z\}$ (d) $\{2n\pi, n\in Z\}$

28. If sec x = 1, then solution set is:

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

29. If sin $x = -1$, then solution set is:

(a) $\{-\frac{\pi}{2}\}$ (b) $\{-\frac{3\pi}{2}\}$ (c) $\{-\frac{\pi}{2}+n\pi, n\in Z\}$ (d) $\{2n\pi, n\in Z\}$

30. If cos $x = -1$, then solution set is:

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

(c) $\{\pi + 2n\pi, n\in Z\}$ (d) $\{2n\pi, n\in Z\}$

31. If cosec = -1, then solution set is:

(a) $\{-\frac{\pi}{2}\}$ (b) $\{-\frac{3\pi}{2}\}$ (c) $\{-\frac{\pi}{2}+n\pi, n\in Z\}$ (d) $\{2n\pi, n\in Z\}$

32. If sec $x = -1$, then solution set is =

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

33. If $\tan 4x = 1$, then value of x in $[0, 2\pi]$ is:

(a) $\{\frac{\pi}{4},\frac{5\pi}{4}\}$ (b) $\{\frac{\pi}{16},\frac{5\pi}{16}\}$ (c) $\{\frac{\pi}{8},\frac{5\pi}{8}\}$ (d) $\{\frac{\pi}{8},\frac{\pi}{16}\}$

34. One solution of sec $x = -2$ is:

(a) $\frac{2\pi}{3}$ (b) $\frac{\pi}{3}$ (c) $\frac{4\pi}{5}$ (d) $\frac{-\pi}{3}$

35. If $\cos\theta = -\frac{1}{2}$ and $\sin\theta = \frac{-\sqrt{3}}{2}$, then θ is:

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

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

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

37. Solution of $\sin x = \frac{1}{2}$ in $[0, \pi]$ is:

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

ANSWERS

Chapter - 1 ANSWERS KEY

(1) d (2) b (3) d (4) a (5) b (6) a (7) b (8) a (9) b (10) a
(11) b (12) a (13) a (14) a (15) b (16) d (17) d (18) e. (19) a (20) b
(21) c (22) b (23) a (24) c (25) a (26) d (27) c (28)d (29) a (30) c
(31) c (32) b (33) b (34) c (35) a (36) c (37) b (38) c (39) d (40) a
(41) a (42) a (43) a (44) c (45) a (46) c (47) d (48) a (49) b (50) b
(51) d (52) a (53) a (54) b (55) b (56) a (57) a (58) c (59) b (60) a
(61) b (62) a (63) a (64) a (65) d (66) c (67) a (68) b (69) b (70) a
(71) c (72) a (73) a (74) b (75) c (76) a (77) b (78) b (79) a (80) a
(81) c (82) c (83) b (84) a

Chapter- 2 ANSWER KEY

(1) a (2) b (3) a (4) a (5) d (6) b (7) a (8) b (9) a (10) b
(11) a (12) a (13) b (14) b (15) a (16) a (17) a (18) c (19) b (20) a
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(31) a, (32) d (33) d (34) a (35) b (36) a (37) a (38) d (39) d (40) c
(41) d (42) e (43) e (44) b (45) b (46) b (47) a (48) b (49) d (50) a
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(61) d (62) b (63) a (64) b (65) a (66) b (67) c (68) b (69) a (70) b
(71) a (72) a (73) a (74) a (75) a (76) b (77) d (78) b (79) a (80) d
(81) c (82) a (83) a (84) b (85) b (86) b (87) a (88) a (89) b (90) c
(91) d (92) d (93) a (94) b (95) c (96) c (97) a (98) b (99) a (100) d
(101) a (102) b (103) c (104)b (105) b (106) b (107) a (108) a (109) c (110) a
(111) b (112) c (113) a (114) a (115) b (116) c (117) c (118) c (119) c (120) c
(121) c (122) c (123) b (124) a (125) d (126) a (127) c (128)a (129) b (130) b
(131) c (132) b (133) a (134) b (135) b (136)a (137) c (138) c (139)a (140)c,a
(141)a (142) b

Chapter- 3 ANSWERS KEY

(1) a (2) a (3)b (4) a (5) a (6) a (7) a (8) b (9) c (10) d
(11) b (12) a (13) a (14) d (15) a (16) b (17) a (18) d (19) a (20) d
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(61) b (62) b (63) a (64) d (65) b (66) a (67) b (68) a (69) b (70) c
(71) d (72) c (73) a (74) b (75) b (76) a (77) a (78) d (79) b (80) a
(81) c (82) a (83) a (84) c

Chapter- 4 ANSWERS KEY

(1) b (2) b (3) a (4) a (5) a (6) c (7) c (8) b (9) a (10) c
(11) c (12) a (13) c (14) b (15) c (16) b (17) c (18) c (19) a (20) c
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(51) b (52) b (53) a (54) b (55) a (56) c (57) d (58) c (59) d (60) b
(61) a (62) a (63) a (64) d (65) a (66) d (67) c (68) b

Chapter- 5 ANSWERS KEY

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

Chapter- 6 ANSWERS KEY

(1) a (2) b (3) c (4) a (5) c (6) d (7) a (8) d (9) b (10) a
(11) b (12) a (13) d (14) b (15) b (16) a (17) a (18) a (19) a (20) b
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(61) a (62) a (63) c (64) a (65) d (66) a (67) b (68) b (69) c (70) c
(71) c (72) c (73) c

Chapter- 7 ANSWERS KEY

(1) a (2) a (3) b (4) d (5) a (6) a (7) c (8) b (9) b (10) b
(11) a (12) b (13) a (14) a (15) a (16) a (17) d (18) c (19) b (20) d
(21) a (22) b (23) b (24) c (25) b (26) b (27) c (28) a (29) b (30) b
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(51) a (52) b (53) b (54) b (55) b (56) b (57) a (58) a (59) c (60) b
(61) a (62) b (63) b (64) a (65) a (66) a (67) a (68) b (69) c (70) a
(71) c (72) d (73) a (74) d (75) c (76) d (77) a

Chapter - 8 ANSWERS KEY

(1) c (2) d (3) b (4) b (5) a (6) b (7) a (8) b (9) c (10) b
(11) a (12) c (13) a (14) b (15) a (16) b (17) b (18) b (19) b (20) c
(21) b (22) d (23) b (24) b (25) a (26) b (27) d (28) d (29)b (30) a
(31) d (32) a (33) b (34) d (35) c

Chapter- 9 ANSWERS KEY

(1) b (2) c (3) b (4) d (5) c (6) d (7) d (8) b (9) b (10) b
(11) b (12) b (13) b (14) a (15) c (16) c (17) b (18) c (19) c (20) d
(21) b (22) c (23) a (24) a (25) a 26) b (27) a (28) b (29) a (30) a
(31) a (32) c (33) b (34) a (35) c (36) a (37) b (38) b (39) b (40) c
(41) b (42) d (43) a (44) b (45) c (46) a (47) b (48) c (49) d (50) b
(51) a (52) a (53) c (54) b (55) d (56) b (57) a (58) a (59) a (60) b
(61) d (62) b (63) d

Chapter- 10 ANSWERS KEY

(1) a (2) a (3) b (4) a (5) b (6) d (7) c (8) c (9) d (10) b
(11) a (12) d (13) d (14) b (15) c (16) a (17) a (18) b (19) d (20) a
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(61) a (62) a (63) b (64) a (65) b (66) b (67) c (68) a

Chapter- 11 ANSWERS KEY

(1) a (2) a (3) c (4) b (5) c (6) b (7) b (8) b (9) a (10) a
(11) b (12) b (13) d (14) b (15) b (16) a (17) a (18) b (19) b (20) c
(21) b (22) a (23) b (24) a (25) c (26) c (27) a (28) a (29) c (30) d
(31) b (32) d (33) b (34) d (35) d (35) b

Chapter- 12 ANSWERS KEY

(1) d (2) b (3) a (4) b (5) a (6) d (7) a (8) b (9) c (10) c
(11) a (12) c (13) d (14) c (15) b (16) d (17) b 18) d (19) d (20) d
(21) c (22) a (23) d (24) d (25) b (26) b (27) d (28) c (29) d (30) c
(31) c (32) a (33) a (34) a (35) c (36) c (37) b (38) b (39) c (40) a
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(51) a (52) d (53) a (54) c (55) a

Chapter- 13 ANSWERS KEY

(1) a (2) b (3) c (4) d (5) b (6) c (7) a (8) a (9) b (10) b
(11) c (12) c (13) a (14) a (15) b (16) b (17) c (18) c (19) a (20) b
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(31) b (32) a (33) b (34) b (35) a (36) a (37) d (38) a (39) d (40) c
(41) a (42) d (43) a (44) b 45) d (46) a (47) d (48) a (49) b (50) a
(51) b (52) a (53) b (54) b (55) a (56) c (57) a (58) a (59) a (60) a
(61) c (62) c (63) a (64) c (65) d

Chapter- 14 ANSWERS KEY

(1) b (2) a (3) a (4) c (5) a (6) a (7) c (8) d (9) a (10) d
(11) b (12) a (13)b (14) c (15) d (16) a (17) d (18) a (19) c (20) b
(21) c (22) c (23)c (24) c (25) c (26) c (27) c (28) d (29) a (30) c
(31) a (32) d (33) b (34) a (35) c (36) a (37) c

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