MULTIPLE CHOICE QUESTIONS (MCQ'S)

1. Which of the following is Unary Operation?
   (a) Addition (b) Multiplication
   (c) Square Root (d) None of these
2. If for all $a, b \in A$, $a * b \in A$ then
   (a) $*$ is a Unary operation in A
   (b) $a * b = b * a$
   (c) $*$is a binary operation in A
   (d) $a * b \neq b * a$
3. $*$ is said to be commutative in A if for all $a, b \in A$
   (a) $a + b = b + a$ (b) $a * b = b * a$
   (c) $a - b = b - a$ (d) $a * b \neq b * a$
4. If $*$ is a binary operation in A then
   (a) A is closed under $*$ (b) A is not closed under $*$
   (c) A is closed under $*$ (d) A is closed under $+$
5. An element $e \in A$ is said to be identity element with respect to a binary operation $*$ on A if for all $a \in A$.
   (a) $e * a = a * e = 0$ (b) $e * a = a * e \neq a$
   (c) $e * a = a * e = e$ (d) $e * a = a * e = a$
6. In the group $(G, *)$
   (a) $a + b \in G \ \forall \ a, b \in G$ (b) $ab \in G \ \forall \ a, b \in G$
   (c) $a * b \in G \ \forall \ a, b \in G$ (d) $a - b \in G \ \forall \ a, b \in G$
7. If $(G, *)$ is a group then for all $a \in G$ three exists $a' \in G$ Such that
   (a) $a * a' = 0 = a' * a$ (b) $a * a' = a' = a' * a$
   (c) $a * a' = a = a' * a$ (d) $a * a' = e = a' * a$
8. $(G, *)$ is a Commutative (or) abelian group if for all $a, b \in G$.
   (a) $a * b = b * a$ (b) $a * b \neq b * a$
   (c) $a + b = b * a$ (d) $a * b = b + a$
9. Number of identity elements in any group is _____.
   (a) 1 (b) 2 (c) 3 (d) 4
10. Z is a group under.
    (a) Subtraction (b) Division
    (c) Multiplication (d) Addition

11. The Action of wearing Socks and Shoes
(a) Do not Commute (b) Commute
(c) Does not Exit (d) is Associative
12. The set of all non-singular matrices of order 2 forms a non-abelian group under.
(a) Addition (b) Subtraction
(c) Multiplication (d) Division
13. A monoide is always a ________ .
(a) a group (b) a commutative group
(c) a non-abelian group (d) groupoid
14. A monoide is always a ________.
(a) a group (b) a commutative group
(c) a non-abelian group (d) Semi-group
15. A semi-group is always a
(a) a group (b) a commutative group
(c) groupoid (d) a non-abelian group
16. A closed set with respect to some binary operation is called ________.
(a) a group (b) a commutative group
(c) groupoid (d) a non-abelian group
17. A non-empty set which is closed with respect to some binary operation is called the semi group if.
(a) the binary operation is associative
(b) the binary operation is commutative
(c) the binary operation is anti-commutative
(d) identity element exists
18. A non-empty set which is closed with respect to some associative binary operation is called the monoid if
(a) inverse of each element exists
(b) the binary operation is commutative
(c) the binary operation is anti-commutative
(d) identity element exists
19. If G = $\{1, -1, i, -i\}$ is a group under multiplication, then inverse of i is.
(a) 1 (b) -1
(c) i (d) None of these
20. If a, b are elements of a group G then $(ab)^{-1}$ = ______.
(a) $a^{-1}b^{-1}$ (b) $b^{-1}a^{-1}$ (c) $a^{-1}b$ (d) $b^{-1}a$

21. A binary operation on non-empty set is a
(a) Rule (b) function
(c) both (a) & (b) (d) None of these
22. The Unary operation is an operation which yields another number when perform on ________.
(a) a single number (b) Two numbers
(c) Three numbers (d) None of these
23. Addition is a binary operation on set ______.
(a) R (b) C (c) W (d) N
24. Multiplication is a binary operation on set ________.
(a) R (b) C (c) W (d) N
25. let S = $\{1, -1\}$ then _______ are binary operation on S.
(a) Addition and Multiplication
(b) Addition and Subtraction
(c) Multiplication and division
(d) Multiplication and Subtraction
26. S = $\{1, -1\}$ and F = $\{1, 2\}$ then multiplication is not a binary operation on_______.
(a) S (b) F
(c) both S & F (d) None of these
27. let $\odot$ be binary operation on Z defined by
$a \odot b = (a + b) + 3\ \forall\ a, b \in Z$ then $5\odot 7$ = ________.
(a) 15 (b) 12 (c) 35 (d) 38
28. let $\odot$ be a binary operation on Q^+ Defined by
$a \odot b = (a + b) \times 3\ \forall\ a, b \in Q^+$ then $\frac{1}{2} \odot \frac{5}{4}$ = ________.
(a) Zero (b) $\frac{6}{5}$
(c) $\frac{15}{8}$ (d) None of these
29. On R define a binary operation by $a \odot b = (a - b)\ \forall\ a, b \in R$ then $7 \odot 9$ = _______.
(a) 2 (b) -2
(c) ± 2 (d) None of these
30. The binary operation $\odot$ on R is defined by $a \odot b = \max(a, b)\ \forall\ a, b \in R$ then $3 \odot 3$ = ________.
(a) 4 (b) 5
(c) 3 (d) None of these

31. Define a binary operation * in Q by a * b = 4ab $\forall$ a, b $\in$ Q then 4 * 2 = ________.
(a) 4 (b) 8 (c) 12 (d) 32

32. Define $a * b = \frac{ab}{3}$ $\forall$ a, b $\in$ Q^+ then 7 * 6 = _______.
(a) 42 (b) 14 (c) 21 (d) None of these

33. let a binary operation * be define on Z by a * b = a + b – ab then 1 * 2 = _______.
(a) 2 (b) 1 (c) –1 (d) –2

34. A set "S" can have atmost _______ identity element w.r to the given binary operation *
(a) one (b) Two (c) three (d) four

35. Zero "O" is the identity element of Q w.r to ________.
(a) Multiplication (b) Subtraction
(c) Addition (d) Division

36. Unity, "1" is the identity element of Q w.r to _______.
(a) Multiplication (b) Subtraction
(c) Addition (d) Division

37. Which Set has no identity element w.r to "+".
(a) R (b) Q (c) W (d) N

38. Which Set has no identity element w.r to "•".
(a) Set of prime numbers (b) Set of even numbers
(c) Set of irrational numbers (d) None of these

39. let S = {A, B, C, D} where A = {a}, B = {a, b}, C = {a, b, c} and D = ϕ then identity element w.r to "U".
(a) A (b) B (c) C (d) D

40. Define a binary operation * in Q by a * b = 4ab $\forall$ a, b $\in$ Q then identity element w.r to "*" is _______.
(a) $\frac{1}{4}$ (b) 4
(c) –4 (d) None of these

41. In a group G, Inverse of each element of G atmost _______.
(a) one (unique) (b) Two
(c) Three (d) None of these

42. Define a binary operation "*" in Q by a * b = ab $\forall$ a, b $\in$ Q then inverse of a = ____ where $\frac{1}{4}$ is the identity element.
(a) $\frac{1}{16}$ (b) $\frac{1}{16a}$
(c) 16 (d) Does not exist

43. let S = {1, w, w^2}, I' is the identity element w.r.to "•" then inverse of w is _______.
(a) 1 (b) w
(c) w^2 (d) None of these

44. let S = {1,w,w^2}, I' is the identity element w.r to "•" then inverse of w^2 is ________.
(a) 1 (b) w
(c) w^2 (d) None of these

45. let S = {1, w, w^2}, I' is the identity element w.r to "•" then inverse of "1" is ________.
(a) w^3 (b) w
(c) w^2 (d) None of these

46. Which of the following sets are group w.r to ordinary multiplication ________.
(a) (Q, •) (b) (R, –)
(c) (M_3, •) (d) None of these

47. An Ordered pair (G, *) of a non-empty Set G and a binary operation "•" is said to be group if ______.
(a) * is associative
(b) identity element exist w.r to "•
(c) inverse of each element exist"
(d) All of these

48. If S = {Δ, □} and a * b = Δ then multiplication table is ______.

(a)

*	Δ	□
Δ	□	□
□	□	□

(b)

*	Δ	□
Δ	Δ	□
□	□	Δ

(c)

*	Δ	□
Δ	Δ	Δ
□	Δ	Δ

(d) None of these

49. A groupoid (S, *) is called Semi group if * is
(a) Commutative (b) Associative
(c) Not associative (d) None of these

50. A non-empty Set "S" together with one or more bi operations is called _____.
(a) Group (b) Groupoid
(c) Algebraic Structure (d) None of these

51. $(S, *)$ is an ordered pair consisting of a non-empty set S and a binary operation "$*$" defined an S then $(S, *)$ is called ______.
(a) Group (b) Groupoid
(c) Abelian group (d) None of these

52. In all groups binary operation is ______.
(a) Commutative (b) Associative
(c) Distributive (d) None of these

53. In a group G, if every element of a group G is it's own inverse then inverse of ab is ______.
(a) ab (b) $\frac{1}{ab}$
(c) $-ab$ (d) None of these

54. In a group G if $a \times a = b$ then x = ______.
(a) $a^{-1}\, b\, a^{-1}$ (b) $a^{-1}\, a^{-1}\, b$
(c) $b\, a^{-1}\, a^{-1}$ (d) None of these

55. In a group G $(ab)^{-1}$ = ______
(a) $b^{-1}\, a^{-1}$ (b) $a^{-1}b^{-1}$
(c) $(ba)^{-1}$ (d) None of these

56. In a group G, $(abc)^{-1}$ = ______.
(a) $a^{-1}\, b^{-1}\, c^{-1}$ (b) $b^{-1}\, a^{-1}\, c^{-1}$
(c) $c^{-1}\, b^{-1}\, a^{-1}$ (d) $c^{-1}\, a^{-1}\, b^{-1}$

57. In a group G if $a * a = a$ then a = ______.
(a) Zero (b) 1
(c) e (identity) (d) None of these

58. ______ represents a binary operation.
(a) $\forall$ (b) + (c) $*$ (d) $\in$

59. Addition is not a binary operation on the Set of ______ numbers.
(a) Even (b) Odd
(c) Prime (d) None of these

60. A binary operation for addition is ______ if $a + b = b + a$.
(a) Commutative (b) Transitive
(c) Associative (d) Distributive

61. Vector addition of Coplaner vectors is ______.
(a) Associative (b) Commutative
(c) Distributive (d) Transitive

62. Matrix Addition is ______.
(a) Distributive (b) Associative
(c) Transitive (d) Non-Transitive

63. Division and ______ are not associative on Q^+.
(a) Union (b) Intersection
(c) Subtraction (d) Addition

64. Multiplication is a binary operation on ● = ______.
(a) $\{2, -2\}$ (b) $\{1, 2\}$ (c) $\{1, -1\}$ (d) $\{2, 3\}$

65. Matrix addition is a/an ______ binary operation.
(a) Commutative (b) Associative
(c) Distributive (d) Transitive

66. Ordinary addition is ______ operation on the set of integers.
(a) Abelian (b) Composite (c) Cyclic (d) Binary

67. If $S = \{1, -1, i, -i\}$ is a group with respect to ______.
(a) Addition (b) Multiplication
(c) Subtraction (d) Division

68. If $\{0, 1\}$ is closed with respect to ______.
(a) Addition (b) Subtraction
(c) Multiplication (d) Division

69. If $a, b \in S$ then $a * b \in S$ thus S is called ______ w.r to
(a) Closed (b) Non-Closed
(c) Commutative (d) None of these

70. Let S be a set with a binary operation $*$ having identity element e. An element $b \in S$ is said to be ______ of $a \in S$ w.r to $*$ if $a * b = b * a = e$
(a) inverse element (b) identity element
(c) element (d) None of them

71. A binary operation $*$ on a set is said to be commutative if ______.
(a) $a * b = b * a$ (b) $(a * b) * c = a * (b * c)$
(c) $a * b = b * a = e$ (d) $a * e = e * a = a$

72. A binary operation $*$ on a Set is said to be associative if ______.
(a) $a * b = b * a$ (b) $(a * b) * c = a * (b * c)$
(c) $a * b = b * a = e$ (d) $a * e = e * a = a$

73. Let s be a set with a binary operation $*$ an element is said to be an identity element of S w.r to $*$ if ______.
(a) $a * b = b * a$ (b) $(a * b) * c = a * (b * c)$
(c) $a * b = b * a = e$ (d) $a * e = e * a = a$

74. let S be a Set with a binary operation * having and identity element e an element $b \in S$ is said to be an inverse of $a \in S$ w.r to * if ________.
(a) $a * b = b * a$ (b) $(a * b) * c = a * (b * c)$
(c) $a * b = b * a = e$ (d) $a * e = e * a = a$

75. Construct the multiplication table on $S = \{1, -1, i, -i\}$ with respect to (•).

(a)

•	1	−1	i	−i
1	1	−1	i	−i
−1	−1	1	−i	i
i	i	−i	−1	1
−i	−i	i	1	−1

(b)

•	i	−1	i	−i
1	−i	i	−1	1
−1	i	−i	1	−1
i	1	−1	−i	i
−i	−i	1	i	−i

(c)

•	1	−1	i	−i
1	−i	i	1	−i
−1	i	−i	−1	1
i	−1	1	−i	i
−i	1	−1	i	−i

(d) None of these

76. Find an identity element in R w.r to * is defined by $a * b = \sqrt{a^2 + b^2}$
(a) 1 (b) Zero (c) ½ (d) ¼

77. Find an inverse of $\frac{1}{12}$ w.r to * if $a * b = 4ab$ an $e = ¼$
(a) 3/4 (b) 4/3 (c) 12 (d) 1/6

78. A groupoid (S, *) then satisfies _____ operation.
(a) binary (b) Commutative binary
(c) Associative binary (d) None of these

79. Which is the groupoid ________.
(a) $(W, +)$ (b) $(R, +)$ (d) $(M_3, \bullet)$ (d) $(V, \bullet)$

80. Which is the group _______.
(a) $(Z, +)$ (b) $(W, \bullet)$ (c) $(Q, \bullet)$ (d) $(R, -)$

81. Find the value of $(a^{-1})^{-1}$ = _________.
(a) a^{-1} (b) a (c) a^2 (d) a^3

82. Is (Z, *) is a group when defined by $a * b = 0$ for all $a, b \in Z$
(a) yes (b) No
(c) Neither yes or No (d) None of these

83. The Null set is a group w.r to multiplication.
(a) yes (b) No
(c) Neither yes or No (d) None of these

84. The every element of a group there is one inverse element w.r to *.
(a) Correct (b) Uncorrect (c) yes (d) No

85. Find an identity element in $(R - \{-1\})$ w.r to * is defined by $a * b = a + b + ab$.
(a) 1 (b) Zero (c) ½ (d) 2.

86. Find an identity of $(Q', *)$ if * is defined by $a * b = \frac{ab}{3}$
(a) Zero (b) 1 (c) 2 (d) 3

87. Find an identity of (R, *) if * is defined by $a * b = 7ab$.
(a) Zero (b) 1 (c) 7 (d) 1/7

88. Find an identity of (Z, *) if * is defined by $a * b = a + b - a$
(a) Zero (b) 1 (c) 2 (d) ½

89. Set N is not groupoid w.r to
(a) Addition (b) Subtraction
(c) Multiplication (d) None of these

90. Set $\{1, -1\}$ is groupoid w.r to
(a) Addition (b) Subtraction
(c) Multiplication (d) Union

91. Set of whole integers is not groupoid w.r to _______.
(a) Addition (b) Multiplication
(c) Subtraction (d) None of these

92. If a groupoid has Associative property then it is called _______.
(a) group (b) Semi group
(c) Monoide (d) Abelian group

93. Power Set of any Set together with binary operation.
(a) Semi-group (b) Non-abelian
(c) Non-Commutative (d) None of these

94. A Semi-group having an identity is called ___________.
(a) Semi-group (b) groupoid
(c) Monoide (d) group

95. Identity in a power Set of any Set is ________.
(a) ϕ (b) Singleton Set
(c) Set itself (d) None of these

96. The Set of Natural numbers (N) has no identity element w.r to ______.
(a) Subtraction (b) Addition
(c) Multiplication (d) Division
97. Set of prime numbers has no identity element w.r to ______.
(a) Subtraction (b) Addition
(c) Multiplication (d) Division
98. A Semi-group is also called ______ groupoid.
(a) Commutative (b) Associative
(c) Non-Commutative (d) None of these
99. Set $\{1, -1\}$ is groupoid w.r to ______.
(a) Multiplication (b) Addition
(c) Subtraction (d) Division
100. Which is the identity element of R with respect to ordinary addition?
(a) 0 (b) 1
(c) −1 (d) None of these
101. Which is the identity element of R with respect to ordinary Subtraction?
(a) 0 (b) 1
(c) −1 (d) None of these
102. Which is the identity element of R w.r to ordinary multiplication?
(a) 0 (b) 1
(c) −1 (d) None of these
103. Which is the identity element of R with respect to Ordinary division?
(a) 0 (b) 1
(c) −1 (d) None of these
104. If every element of group G is it's own inverse then G is ______.
(a) Abelian group (b) Semi group
(c) Groupoid (d) None of these
105. Identity of a binary operation is ______.
(a) Unique (b) Different
(c) Two (d) None of these
106. A Group (G, *) is said to be an abelian group if "*" is ?
(a) $g * h = h * g$ (b) $gh = hg$
(c) $g^2 = h^2$ (d) $g + h = h + g$

107. A group (G, *) is said to be ______ if G consists of a finite number of elements.
(a) Groupoid (b) finite group
(c) Semi-group (d) Infinite group
108. A non-empty Set S which is Closed with a binary operation "*" is called group if.
(a) The binary operation is associative
(b) There exists identity element with respect to the binary operation
(c) There exists a Unique inverse of each element of S with respect to the binary operation
(d) All (a), (b) and (c)
109. If Set S is a group w.r to addition then each element of S has ______ inverse.
(a) Unique (b) Two
(c) Three (d) None of these
110. If Set S is a group w.r to addition then the number of identity elements in S is
(a) Unique (b) Two
(c) Three (d) None of these
111. The Set $(R - \{0\})$ of real numbers is closed w.r to
(a) Addition (b) Multiplication
(c) Division (d) None of these
112. (R, −) is a ______.
(a) group (b) Semi group
(c) groupoid (d) None of these
113. Semi-group $(M_3, +)$ is also a ______.
(a) Monoide (b) Infinite group
(c) group (d) None of these
114. (N, +) is not a ______.
(a) groupoid (b) Semi group
(c) Monoid (d) group
115. (N, x) is not a ______.
(a) group (b) Semi group
(c) Monoide (d) groupoid
116. (R, +) is a ______.
(a) group (b) Monoid
(c) abelian group (d) None of these

117. $(R+, \bullet)$ is a ________.
(a) Monoid (b) group
(c) groupoid (d) None of these

118. $(C, +)$ is a ________.
(a) Monoid (b) group
(c) groupoid (d) None of these

119. $(C^+, \bullet)$ is a ________.
(a) Monoid (b) groupoid
(c) group (d) None of these

120. $(Z^+, +)$ is a Semi group but not a ________.
(a) Monoid (b) Abelian group
(c) group (d) None of these

121. $(Z^-, \bullet)$ is not a ________.
(a) groupoid (b) Monoid
(c) Semi group (d) None of these

122. $(Z^+, -)$ is not a ________.
(a) Monoid (b) groupoid
(c) Semi group (d) None of these

123. $(V_3, \bullet)$ is not a ________.
(a) Monoid (b) groupoid
(c) Semi group (d) None of these

Answers

1.	*c*	**2.**	*c*	**3.**	*b*	**4.**	*a*	**5.**	*d*
6.	*c*	**7.**	*d*	**8.**	*a*	**9.**	*a*	**10.**	*d*
11.	*a*	**12.**	*c*	**13.**	*d*	**14.**	*d*	**15.**	*c*
16.	*c*	**17.**	*a*	**18.**	*d*	**19.**	*d*	**20.**	*b*
21.	*c*	**22.**	*a*	**23.**	*d*	**24.**	*d*	**25.**	*c*
26.	*b*	**27.**	*a*	**28.**	*b*	**29.**	*a*	**30.**	*c*
31.	*d*	**32.**	*b*	**33.**	*b*	**34.**	*a*	**35.**	*c*
36.	*a*	**37.**	*d*	**38.**	*a*	**39.**	*d*	**40.**	*a*
41.	*a*	**42.**	*d*	**43.**	*c*	**44.**	*b*	**45.**	*a*
46.	*d*	**47.**	*d*	**48.**	*b*	**49.**	*b*	**50.**	*c*
51.	*b*	**52.**	*b*	**53.**	*a*	**54.**	*a*	**55.**	*a*
56.	*c*	**57.**	*c*	**58.**	*c*	**59.**	*b*	**60.**	*a*
61.	*a*	**62.**	*b*	**63.**	*c*	**64.**	*c*	**65.**	*a*
66.	*d*	**67.**	*b*	**68.**	*c*	**69.**	*a*	**70.**	*a*

71.	*a*	72.	*b*	73.	*d*	74.	*c*	75.	*a*
76.	*b*	77.	*a*	78.	*a*	79.	*c*	80.	*a*
81.	*b*	82.	*b*	83.	*a*	84.	*a*	85.	*b*
86.	*d*	87.	*d*	88.	*a*	89.	*b*	90.	*c*
91.	*c*	92.	*b*	93.	*a*	94.	*c*	95.	*a*
96.	*b*	97.	*c*	98.	*b*	99.	*a*	100.	*a*
101.	*d*	102.	*b*	103.	*d*	104.	*a*	105.	*a*
106.	*a*	107.	*b*	108.	*d*	109.	*a*	110.	*a*
111.	*a*	112.	*c*	113.	*c*	114.	*d*	115.	*a*
116.	*a*	117.	*b*	118.	*b*	119.	*c*	120.	*a*
121.	*a*	122.	*b*	123.	*b*				