Dr.G.R.Damodaran College of Science

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CRISL rated 'A' (TN) for MBA and MIB Programmes

I BSc(Information Technology)-[2017-2020]
Semester-I
Allied:Mathematical Foundations for Information Technology-112B
Multiple Choice Questions.

1. Let S be a start symbol and S->AB, A->aB, B->b be a grammar then a string generated by the grammar is _____.
   A. abb
   B. aba
   C. baa
   D. bba
  ANSWER: A

2. Let R = {(3, 3), (6, 6), (9, 9), (12, 12), (6,3), (3, 9), (9, 3), (3, 6)} be a relation on the set A = {3, 6, 9, 12}. The relation is _____
   A. reflexive
   B. symmetric
   C. reflexive and transitive
   D. transitive
  ANSWER: C

3. The number of rows in the truth table of negation (P and (negation Q)) is_____
   A. 2
   B. 4
   C. 6
   D. 8
  ANSWER: B

4. The conditional statement P->Q is equivalent to _____
   A. Q->P
   B. P <->Q
   C. negationP or Q
   D. negation P or negation Q
  ANSWER: C

5. Let R={(1,b),(3,d),(2,b)} and S={(4,b),(2,5),(3,a)} be a relation then R . S=____
   A. Empty
   B. {(1,1),(3,b),(2,5)}
   C. {(1,5),(3,a),(2,5)}
   D. {(1,5),(3,b),(2,b)}
   ANSWER: A

6. The binary relation R = {(0, 0), (1, 1), (1, 2), (2, 1)} on A = {0, 1, 2, 3, } is _____
   A. reflexive
   B. symmetric
   C. symmetric and transitive
   D. reflexive and transitive
   ANSWER: C

7. Define a binary relation R = {(0, a), (1, b), (2, c), (3, b), (2, 0)} on A = {0, 1, 2, 3}. The directed graph (including loops) of the transitive closure of this relation has ____arrows.
   A. 2
   B. 4
   C. 8
   D. 16
   ANSWER: D

8. The production S -> aB is of the type _____
   A. type 1, 2
   B. type 2, 3
   C. type 3 only
   D. type 0, 1, 2, 3
   ANSWER: D

9. The production S -> A is of the type _____
   A. type 0
   B. type 1
   C. type 2
   D. type 3
   ANSWER: A

10. If f(x)= x + 3 and g(x)= x+2 then fog is _____
    A. 5
    B. x-5
    C. x+5
    D. x-1
    ANSWER: C

11. A regular grammar contain rules of the form is _____
  A. A->AB
  B. AB->a
  C. A->aB
  D. AB->CD
 ANSWER: C

12. If f(x) = 4x and g(x) = 2x then fog is _____
  A. 4x
  B. 2x
  C. 8x
  D. 6x
 ANSWER: C

13. Consider the divides relation, m | n, on the set A = {2, 3, 4, 5, 6, 7, 8, 9, 10}. Which of the following permutations of A is not a topological sort of this partial order relation? _____
  A. 7,2,3,6,9,5,4,10,8
  B. 2,3,7,6,9,5,4,10,8
  C. 2,6,3,9,5,7,4,10,8
  D. 3,7,2,9,5,4,10,8,6
 ANSWER: C

14. Let R = {<1,2>,<2,4>,<3,6>,<4,8>}, then RoR is _____.
  A. {<1,4>,<2,8>}
  B. {<2,4>,<3,6>}
  C. {<1,2>,<4,8>}
  D. {<1,2>,<3,6>}
 ANSWER: A

15. Dual of (Pand Q)orT=_____.
  A. (Pand Q)orT
  B. (P or Q) and T
  C. (Pand Q)orF
  D. (P or Q) and F
 ANSWER: C

16. A statement variable standing alone is _____.
  A. Tautology
  B. Contradiction
  C. Contingency
  D. Well formed formula

ANSWER: D

17. A product of the variable and or their negation in a formula is called_____.
    A. Tautology
    B. Contradiction
    C. Elementary Product
    D. Elementary Sum
  ANSWER: C

18. Asum of the variable and or their negation in a formula is called_____.
    A. Tautology
    B. Contradiction
    C. Elementary Product
    D. Elementary Sum
  ANSWER: D

19. A formula which is equivalent to a given formula and which consist of a sum of elementary product is called_____.
    A. Elementary Product
    B. Elementary Sum
    C. Disjunctive normal form
    D. Conjunctive normal form
  ANSWER: C

20. A formula which is equivalent to a given formula and which consist of a product of elementary sum is called_____.
    A. Elementary Product
    B. Elementary Sum
    C. Disjunctive normal form
    D. Conjunctive normal form
  ANSWER: D

21. Consider the statement either -2 less than or equal to x less than or equal to -1 or 1less than or equal to x less than or equal to 2 the negation of this statement is
_____
    A. x < -2 or 2 < x or -1 < x < 1
    B. x <-2 or 2 < x
    C. -1 < x < 1
    D. -2 < x < 2
  ANSWER: A

22. A premise can be inserted at any point in the derivation is___.
    A. Rule P
    B. Rule T
    C. Rule CP

D. Equivalnece

ANSWER: A

23. If the formula q is tautologically implied by any one or more of the previous formula in a derivation, then q can be inserted in the derivations is___.
   A. Equivalnece
   B. Rule CP
   C. Rule T
   D. Rule P

ANSWER: C

24. If we can derive a formula S from R and a set of premises, then we can derive R->S from the set of premises alone is _____.
   A. Rule T
   B. Rule P
   C. Equivalnece
   D. Rule CP

ANSWER: D

25. The process of deriving a conclusion from a set of premises by using the standard rules of inference, is called_____.
   A. formal proof
   B. tautology
   C. contradiction
   D. equivalence

ANSWER: A

26. The compound propositions which have the same truth values in all possible cases are called _____.
   A. formal proof
   B. tautology
   C. logically equivalent
   D. contradiction

ANSWER: C

27. A set of formulas A1, A2,....An is inconsistent if their conjunction implies a_____.
   A. tautology
   B. contradiction
   C. logically equivalent
   D. equivalence

ANSWER: B

28. Let A and B be two sets. The cartesian product of A and B is___.
   A. A+B
   B. A*B
   C. A/B

D. A-B

ANSWER: B

29. Which of the following statements is TRUE?

A. For all sets A, B and C, A-(B-C)=(A-B)-C

B. For all sets A, B and C, (A-B)intersection(C-B)=(A intersection C)-B

C. For all sets A, B and C, (A-B)intersection(C-B)=A-(B union C)

D. For all sets A, B and C, if A intersection C = B intersectionC then A=B

ANSWER: B

30. Let R= { <1,2> <3,4> <2,2>}, S= { <4,2> <2,5> <3,1> <1,3>} then RoS is _____

A. { <1,5> <3,2> <2,5>}

B. { <4,2> <2,2> <1,2>}

C. { <3,4> <3,1> <1,3> }

D. { <2,2> <2,5> <4,2>}

ANSWER: A

31. Composition of relation is _____

A. not associative

B. not commutative

C. not transitive

D. not reflexive

ANSWER: B

32. Composition of relation is _____

A. commutative

B. associative

C. distributive

D. absorption

ANSWER: B

33. If A = {1,2,3,4}, B = {2,5,6,7} then A intersection B is _____

A. {1}

B. {2}

C. {3}

D. {4}

ANSWER: B

34. Let f : X-> Y and g : Y -> Z. Let h = g . f : X -> Z. Suppose g is one-to-one and onto. Which of the following is FALSE?

A. If f is one-to-one then g is one-to-one and onto

B. If f is not onto then g is not onto

C. If f is not one-to-one then g is not one-to-one

D. If f is one-to-one then g is one-to-one

ANSWER: A

35. Simple statements are also called _____ statements.

A. molecular

B. compund

C. atomic

D. complex

ANSWER: C

36. The statements formed from atomic statements are called_____statements

A. molecular

B. atomic

C. primary

D. primitive

ANSWER: A

37. The negation of the statement is formed by introducing _____

A. NOT

B. AND

C. OR

D. XOR

ANSWER: A

38. If a statement is P: I went to my class yesterday, then negation P is____.

A. i did not go to my class yesterday

B. i was absent to my class yesterday

C. it is not the case that I went to my class yesterday

D. all the above

ANSWER: D

39. If the truth value of P is false then the truth value of negation P is_____.

A. true

B. false

C. either true or false

D. neither true nor false

ANSWER: A

40. The conjunction of the statement is formed by introducing _____

A. NOT

B. AND

C. OR

D. XOR
ANSWER: B

41. If the statements are given by P:It is raining today, Q: There are 20 tables in this room. Then P and negation Q is _____.
    A. if it is raining today then there are 20 tables in this room
    B. it is raining today and there are 20 tables in this room
    C. it is raining today or there are 20 tables in this room
    D. it is raining today but there are 20 tables in this room
   ANSWER: B

42. If the statement P has the truth value T and Q has the truth value F then P or Q is _____.
    A. T
    B. F
    C. T or F
    D. both T and F
   ANSWER: A

43. If the statement P has the truth value T and Q has the truth value F then P and Q is _____.
    A. T
    B. F
    C. T or F
    D. both T and F
   ANSWER: B

44. The conditional statement is formed by introducing _____
    A. If P then Q
    B. P and Q
    C. P iff Q
    D. P or Q
   ANSWER: A

45. The Bi-conditional statement is formed by introducing _____
    A. P and Q
    B. P or Q
    C. P iff Q
    D. if P then Q
   ANSWER: C

46. If P has the truth value t and q has truth value F then P->Q is _____
    A. T
    B. F
    C. both T and F

D. T or F

ANSWER: B

47. A statement formula which is true regardless of the truth vale of the statements which replaces the variable in it is called _____
   A. universally valid formula
   B. a logically truth
   C. tautology
   D. all the above

ANSWER: D

48. A statement formula which is false regardless of the truth vale of the statements which replaces the variable in it is called _____
   A. a logically truth
   B. contradiction
   C. equivalence
   D. tautologically implications

ANSWER: B

49. If the range R=Y then the mapping f: X-> Y is called _____
   A. onto
   B. into
   C. one-one
   D. one-one on to

ANSWER: A

50. A set is _____.
   A. a collection of facts
   B. a collection of numbers or alphabets
   C. a collection of well defined objects
   D. none of the above

ANSWER: C

51. If an edge e is said to join the vertices u and v then the vertices u and v are called ____
   A. initial vertices
   B. terminal vertices
   C. ends of e
   D. all the above

ANSWER: C

52. Edges intersect only at their ends are called _____
   A. planar
   B. loop
   C. link

D. non planar

ANSWER: A

53. Two vertices which are incident with the common edge are called _____
   A. distinct
   B. directed
   C. adjacent
   D. loop

ANSWER: C

54. An edge with identical ends is called _____.
   A. complete graph
   B. bipartite graph
   C. loops
   D. link

ANSWER: C

55. An edge with the distinct ends are called _____
   A. complete graph
   B. bipartite graph
   C. loops
   D. link

ANSWER: D

56. A simple graph in which each pair of distinct vertices is joined by an edge is called a_____graph.
   A. simple
   B. complete
   C. regular
   D. weighted

ANSWER: A

57. The graph is said to be a simple graph if it has no _____.
   A. loops
   B. edges
   C. vertices
   D. links

ANSWER: A

58. Each edge has one end in X and one end in Y then the graph (X, Y) is called _____
   A. simple
   B. empty
   C. bipartite

D. complete

ANSWER: C

59. The graph defined by the vertices and edges of a _____ is bipartite.
   A. cube
   B. single
   C. square
   D. rectangle

ANSWER: A

60. To any graph G there corresponds a vertices * edges matrix called _____matrix.
   A. null
   B. square
   C. adjacency
   D. incidence

ANSWER: D

61. If H is a sub graph of G then G is a _____ of H.
   A. super graph
   B. spanning sub graph
   C. proper sub graph
   D. induced sub graph

ANSWER: A

62. If the graph G1 and G2 has no vertex in common then it is said to be _____
   A. disjoint
   B. union
   C. intersection
   D. edge disjoint

ANSWER: A

63. The degree of vertex V in G is _____.
   A. number of edges of G incident with V
   B. number of loops in G
   C. number of links in G
   D. number of sub graph in G

ANSWER: A

64. If the edges of a walk W are distinct then Wis called _____
   A. path
   B. trial
   C. walk

D. cycle

ANSWER: B

65. The number of primes of the form | n power 2 - 6n + 5 | where n is an integer is _____

   A. 0

   B. 1

   C. 2

   D. 3

ANSWER: C

66. If the vertices of a walk W are distinct then W is called _____

   A. trial

   B. walk

   C. tour

   D. path

ANSWER: D

67. If a walk has positive length and its origin and terminals are same then it is called _____

   A. open

   B. closed

   C. path

   D. walk

ANSWER: B

68. Each loop counting as _____ edges .

   A. 1

   B. 2

   C. 0

   D. both a and b

ANSWER: B

69. If A = {1,2,4} and B = {3,5,7} then A U B is _____

   A. {1,2,3,4,5,7}

   B. {1,2,4,5,7}

   C. { 1,2,3,5,7}

   D. { }

ANSWER: A

70. If A = {1,2,3,4}, B = {6,7,8,9} then A intersection B_____

   A. {1, 2, 3, 4,6,7,8,9}

   B. {1, 2, 6,7}

   C. { }

D. { 5}
ANSWER: C

71. Let X = {a,b,c} and Y = {0,1} then X x Y= _____
   A. {<a,0>,<b,0>,<c,0>,<a,1>,<b,1>,<c,1>}
   B. {<a,0>,<a,1>,<a,2>,<b,1>,<b,0>,<b,2>}
   C. {<b,0>,<b,1>,<b,2>,<c,0>,<c,1>,<c,2>}
   D. {<c,0>,<c,1>,<c,2>,<a,0>,<a,1>,<a,2>}
   ANSWER: A

72. If f(x) = x+2, g(x) = x-2 for x belongs to real numbers, then g . f is _____
   A. x
   B. 2x
   C. x+2
   D. x-2
   ANSWER: A

73. Let f : x->y be f= {<1,p>,<2,p>,<3,q>} and g:y->z be g={<p,b>,<q,b>} then gof is _____.
   A. {<1,b>,<2,b>,<3,b>}
   B. {<b,1>,<b,2>,<b,3>}
   C. {<p,b>,<q,b>,<1,p>}
   D. {<p,1>,<p,2>,<p,3>}
   ANSWER: A

74. A binary relation R in a set X is reflexive if _____.
   A. xRx
   B. xRy=>yRx
   C. xRy and yRx=>xRz
   D. xRy
   ANSWER: A

75. R is called symmetric whenever _____
   A. xRx
   B. xRy=>yRx
   C. xRy and yRx=>xRz
   D. xRy which is not implies to yRx
   ANSWER: B

76. R is called anti-symmetric whenever _____
   A. xRx
   B. xRy=>yRx
   C. xRy and yRx=>xRz

D. xRy which is not implies to yRx

ANSWER: D

77. A binary relation R in a set X is reflexive if _____.

A. xRx

B. xRy=>yRx

C. xRy and yRx=>xRz

D. x does not related to x

ANSWER: D

78. R is called transitive whenever _____.

A. xRy which is not implies to yRx

B. xRy=>yRx

C. xRy and yRx=>xRz

D. x does not related to x

ANSWER: C

79. If R = {<a,1>,<b,0>,<c,2>} and S = {<c,d>,<0,1>} then R.S is _____

A. (b, 1)

B. (a, 1)

C. (b. 0)

D. (a, b)

ANSWER: A

80. In the matrix all the diagonal elements are equal to one is said to be _____relation.

A. anti symmetric

B. transitive

C. irreflexive

D. reflexive

ANSWER: D

81. If the transpose of the matrix is equal to a relation matrix is said to be_____relation.

A. reflexive

B. irreflexive

C. anti symmetric

D. symmetric

ANSWER: D

82. A set containing no element is called _____.

A. null set

B. finite set

C. infinite set

D. cartesian product

ANSWER: A

83. The set of all divisors of 24 are _____.
   A. 1,2,3,4,6,8,12,24
   B. 1,2,3,4,6,8,12
   C. 1,2,3,4,6,12,24
   D. 1,2,3,6,8,12,24

ANSWER: A

84. The set of all divisors of 30 are _____.
   A. 1,2,5,6,10,15,30
   B. 1,5,10,15,30
   C. 1,2,6,10,30
   D. 1,2,3,5,6,10,15,30

ANSWER: D

85. The greatest lower bound of {8,12} is _____.
   A. 4
   B. 8
   C. 12
   D. 24

ANSWER: B

86. The least upper bound of {8,12} is _____.
   A. 4
   B. 8
   C. 12
   D. 24

ANSWER: C

87. a + (a* b) = a is _____law.
   A. commutative
   B. associative
   C. absorption
   D. de morgan's

ANSWER: C

88. In a bounded lattice, an element b belongs to L is called a complement of an element a belongs to L if _____.
   A. a * b = 0
   B. a - b = 1
   C. a + (a* b) = a

D. a + (a+b) = a

ANSWER: A

89. If each non-empty subsets of a lattice has a least upper bound and greatest lower bound then the lattice is called _____lattice.

   A. modular
   B. complete
   C. distributive
   D. bounded

ANSWER: B

90. A _____ is a complemented distributive lattice.

   A. boolean function
   B. complete lattice
   C. modular lattice
   D. boolean expression

ANSWER: A

91. Boolean expression except 0 can be expressed in an equivalent form called _____.

   A. product
   B. sum
   C. canonical
   D. standard

ANSWER: C

92. If R is Reflexive, Symmetric and Transitive then the relation is said to be _____relation.

   A. void
   B. empty
   C. equivalence
   D. partial ordering

ANSWER: C

93. If R is Reflexive, Anti - Symmetric and Transitive then the relation is said to be _____relation.

   A. void
   B. universal
   C. equivalence
   D. partial ordering

ANSWER: D

94. One to one onto function is also called _____function.

   A. injective
   B. surjective
   C. bijective

D. compostion

ANSWER: C

95. One to one function is also called _____function.

A. injective

B. surjective

C. bijective

D. compostion

ANSWER: A

96. onto function is also called _____function.

A. injective

B. surjective

C. bijective

D. compostion

ANSWER: B

97. The composition of function is Associative but not _____.

A. commutative

B. distributive

C. demorgan's

D. idempotent

ANSWER: A

98. A mapping x into itself is called _____relation.

A. reflexive

B. equivalence

C. poset

D. universal

ANSWER: A

99. Every non-trivial tree has atleast _____vertices of degree one.

A. 1

B. 2

C. 3

D. 4

ANSWER: B

100. Every connected graph contains a _____.

A. tree

B. spanning tree

C. spanning sub tree

D. binary tree

ANSWER: B

101. A minimal non-empty edge - cut of G is called a _____.
   A. path
   B. walk
   C. tour
   D. bond

ANSWER: D

102. A connected graph that has no cut vertices is called a _____.
   A. path
   B. walk
   C. tour
   D. block

ANSWER: D

103. Every block with atleast three vertices are _____connected.
   A. 0
   B. 1
   C. 2
   D. 3

ANSWER: C

104. A graph is eulerian if it contains an _____.
   A. euler tour
   B. euler trial
   C. eulerian graph
   D. binary tree

ANSWER: A

105. Hamilton cycle is a cycle that contains _____.
   A. every edge of G
   B. every cycle of G
   C. every vertex of G
   D. every path of G

ANSWER: C

106. If there are more than 2 LMD for a word then it is said to be _____
   A. grammar
   B. tree
   C. ambiguous

D. un ambiguous

ANSWER: C

107. If exactly only one LMD or RMD in a word then it is said to be _____.
   A. grammar
   B. tree
   C. ambiguous
   D. un ambiguous
 ANSWER: D

108. Collection of all tree is called _____.
   A. directed graph
   B. undirected graph
   C. complete binary tree
   D. forest
 ANSWER: D

109. A finite non-empty set of symbols is called _____.
   A. alphabet
   B. word
   C. letters
   D. language
 ANSWER: A

110. The specification of proper construction of a sentence is called _____
   A. alphabet
   B. language
   C. syntax
   D. sementaics
 ANSWER: C

111. The length of an empty word is_____.
   A. empty
   B. lamda
   C. 1
   D. 2
 ANSWER: A

112. An empty word is denoted by_____.
   A. alpha
   B. beta
   C. lamda

D. gamma

ANSWER: C

113. Context free grammar is also known as _____.

   A. type o
   B. type 1
   C. type 2
   D. type 3

ANSWER: C

114. Context sensitive grammar is also known as _____.

   A. type o
   B. type 1
   C. type 2
   D. type 3

ANSWER: B

115. Phrase structure grammar is also known as _____.

   A. type o
   B. type 1
   C. type 2
   D. type 3

ANSWER: A

116. Regular grammar is also known as _____.

   A. type o
   B. type 1
   C. type 2
   D. type 3

ANSWER: D

117. A class of machine which excepts a _____ language is called finite state automata

   A. type o
   B. type 1
   C. type 2
   D. type 3

ANSWER: D

118. Accepting states are denoted by _____.

   A. an arrow mark
   B. a single circle
   C. a double circle

D. straight line
  ANSWER: C

119. Initial states are denoted by _____.
   A. an arrow mark
   B. a single circle
   C. a double circle
   D. straight line
  ANSWER: A

120. For converting N.D.F.A. to D.F.A. we should _____ all the states which have no incoming.
   A. add
   B. subtract
   C. delete
   D. multiply
  ANSWER: C

121. If there are _____ distinct components in a statement then there is 2 power n combinations of values in the truth table.
   A. n
   B. n+1
   C. n.n
   D. n-1
  ANSWER: A

122. Any vertex having degree one is called _____vertex.
   A. end
   B. pendent
   C. regular
   D. path
  ANSWER: B

123. A graph that has neither self loops nor parallel edges is called_____graph.
   A. trivial
   B. simple
   C. complete
   D. regular
  ANSWER: B

124. A graph in which every vertex has same degree is called _____graph.
   A. trivial
   B. simple
   C. complete

D. regular

 ANSWER: D

125. Complete graph is denoted by _____.
   A. Ln
   B. Dn
   C. Wn
   D. Kn
 ANSWER: D

126. The number of vertices of odd degree in a graph is always_____.
   A. 0
   B. odd
   C. even
   D. odd and even
 ANSWER: C

127. A path of a graph is said to be _____ if it contains all the edges of the graph.
   A. simple
   B. weighted
   C. eulerian
   D. hamiltonian
 ANSWER: C

128. P.C.N.F. is also called _____.
   A. sum of product canonical form
   B. product of sum canonical form
   C. sum canonical form
   D. product canonical form
 ANSWER: B

129. P.D.N.F. is also called_____.
   A. sum of product canonical form
   B. product of sum canonical form
   C. sum canonical form
   D. product canonical form
 ANSWER: A

130. The Subset relation on a set of sets is _____.
   A. a partial ordering
   B. an equivalence relation
   C. transitive and symmetric only

D. transitive and anti-symmetric only

ANSWER: A

131. The minimum number of edges in a connected graph with n vertices is _____.

  A. n

  B. n+1

  C. n-1

  D. 2n

 ANSWER: C

132. The number of distinct simple graphs with upto three nodes is _____.

  A. 3

  B. 5

  C. 7

  D. 9

 ANSWER: C

133. In any undirected graph the sum of degrees of all the vertices _____.

  A. must be even

  B. is twice the number of edges

  C. must be odd

  D. can be even or odd

 ANSWER: D

134. A directed complete graph of n vertices contains _____.

  A. one arrow between each pair of distinct vertices

  B. two arrows between each pair of distinct vertices

  C. n-1 arrows between each pair of distinct vertices

  D. path between every two distinct vertices

 ANSWER: A

135. A directed graph G = (V, E) is said to be finite if its _____.

  A. set V of vertices is finite

  B. set V of vertices & set E of edges are finite

  C. set E of edges are finite

  D. no vertices & edges are repeated

 ANSWER: B

136. Which of the following traversal techniques lists the nodes of binary search in ascending order?

  A. in order

  B. pre order

  C. post order

D. root order
ANSWER: A

137. The number of letters in a word is called _____.
   A. alphabet
   B. length
   C. language
   D. syntax
 ANSWER: B

138. A _____is connected graph without circuit.
   A. tree
   B. eulerian graph
   C. hamiltonian graph
   D. path
 ANSWER: A

139. The direct product of any two distributive lattice is a _____lattice.
   A. modular
   B. distributive
   C. bounded
   D. complete
 ANSWER: B

140. Every distributive lattice is _____lattice.
   A. modular
   B. distributive
   C. bounded
   D. bounded
 ANSWER: A

141. A boolean algebra is a_____lattice.
   A. distributive
   B. modular
   C. distributive and complemented
   D. distributive and modular
 ANSWER: C

142. The specification of the meaning of sentences is called ____of a language.
   A. empty word
   B. syntax
   C. semantics

D. automata

ANSWER: C

143. If R = {(1, a), (1, b), (3, a)} then R inverse = _____.
   A. {(1, a), (b, 1), (3, a)}
   B. {(a, 1), (b, 1), (3, a)}
   C. {(a, 1), (b, 1), (a, 3)}
   D. {(a, 1), (b, 1), (3, 3)}

ANSWER: C

144. If the range of a function is equal to domain then the function is said to be _____function.
   A. one-one
   B. onto
   C. into
   D. one-one onto

ANSWER: B

145. If the range of a function is a single-ton set then the function is said to be_____function.
   A. one-one
   B. onto
   C. into
   D. constant

ANSWER: D

146. The number of vertices adjacent to a given vertex is called the _____.
   A. degree of the vertex
   B. adjacent matrix
   C. incidence matrix
   D. binary tree

ANSWER: A

147. A digraph is _____ connected if for every pair of points there is a path from one to the other.
   A. unilaterally
   B. strongly
   C. weekly
   D. simple

ANSWER: A

148. A digraph is_____connected if there exists a path from every point to every other.
   A. unilaterally
   B. strongly
   C. weekly

D. simple
ANSWER: B

149. A digraph is _____ connected if every pair of points is mutually reachable via a semi path .
   A. unilaterally
   B. strongly
   C. weekly
   D. simple
 ANSWER: C

150. Every _____ with at least two nodes has at least two nodes of degree 1.
   A. directed graph
   B. connected graph
   C. hamiltonian graph
   D. tree
 ANSWER: D

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