**SUBJECT CODE: 17MCA1C2**

**JAMAL MOHAMED COLLEGE(Autonomous)**

**TRIUCHIRAPPALLI-620 020**

**OBJECTIVE TYPE QUESTIONS**

**DEPARTMENT OF COMPUTER SCIENCE**

**Semester: I UG/PG: PG- MCA**

**Title of the Paper: : CORE - II MATHEMATICAL FOUNDATIONS**

**UNIT- I**

1. The Use of Connective Statement is

a) Combine b) Separate

c) Both (a) & (b) d)None of the these

2 . The statements that we consider initially are simple statements called \_\_\_\_\_\_\_\_\_statements.

a) molecular b) compound

c) atomic d) simple

3. To denote a Conditional Statement use

a) Capital Letter b) Small letters

c) Roman Letters d) Both (a) & (b)

4. Negation is

a) binary operator b) unary operator

c) Relation operator d) None of these

5. The Truth values are

a) True b) False

c) True & False d) contradiction

6. The rule of Conditional Statement is

a) P→Q=T-F=F b) Q→P=T-F=F

c) P→Q=F-F=F d) All of these

7. In Statement P→Q , here P is

a) Anticedent ans b) Consequent

c) Variable d) Constant

8. How this statement read as, P⮀ Q

a) If P then Q b)P if and only if Q

c) P is sufficient of Q d) Tautology

9. This ^Symbol means

a) AND b) OR

c) Not d) conditional

10. The use of sentential connectives, the resulting Statement is

a) molecular b) Atomic

c) Variable d) primary

11. A sum of the variables and their negations in a formula is called \_\_\_\_\_\_\_\_\_.

a) elementary sum b)elementary product

c) cnf d) dnf

12. A product of the variables and their negations in a formula is called \_\_\_\_\_\_\_\_\_.

a) elementary product b) elementary sum

c) cnf d) dnf

13. Min-terms of two statements are formed by introducing the connective \_\_\_\_\_\_\_\_\_.

a) Conjunction b) disjunction

c) Conditional d) negation

14. The following statement is belongs to P ٨ (Q V R) *<=>* (P ٨ Q) V (P ٨ R) ,

P V (Q ٨ R) *<=>* (P V Q) ٨ (PVR)

a)commutative law b) Distributive laws

c)De Morgan’s law d)Associative law

15.Max-terms of two statements are formed by introducing the connective \_\_\_\_\_\_\_\_\_.

a) disjunction b) conjunction

c) negation d)conditional

16. If a normal form contains all minterms, then it is \_\_\_\_\_\_\_\_.

a) tautology b) contradiction

c) contingency d) both (a) and (b)

17. A premise may be introduced at any point in the derivation is called \_\_\_\_\_\_\_\_.

a) rule p b) rule p and rule t

c) rule t d) rule cp

18.The Premises (p^q) V r and r →s imply which of the conclusion?

a) p V r b) p V s

c) q V s d) q V r

19. A statement formula which is true regardless of the truth values of the statements in which replace the variable in it called a -------

a) contingency b) tautology

c) contradiction d) both (a) and (b)*.*

20. PCNF is also called \_\_\_\_\_\_\_.

a) sum of product canonical form . b) product of sum canonical form

c) sum canonical form d) product canonical form

**UNIT-II**

21. A set containing no element is called \_\_\_\_\_\_\_\_\_\_\_\_.

a) null set b)finite set

c) infinite set d) equal set

22. A = {1,3,5,7,9} is a \_\_\_\_\_\_\_\_\_\_.

a) null set b) finite set

c) singleton set d) infinite set

23. A set A is called proper subset of set B if if A ⊆ B and A ╪ B

a) A ⊆ B or A ╪ B b) A = B and A ╪ B

c) A ⊆ B and A ╪ B d) A ⊆ B and A = B

24. The relative complement of a set A in a set B is denoted by ---------

a) B + A b) B / A

c) A- B d) B – A

25. Let E be the universal set. For any set A, the relative complement of A with respect to E, that is E – A, is called the ------------of A

a) Relative complement b) absolute complement

c) Symmetric difference d) proper subset

26. The ----------of two sets A and B is the set of all ordered pairs (a, b) where a Є A and b Є B. It is denoted by A X B.

a)intersection b)union

c) Disjoint sets d) Cartesian product

27. Let S = {a, b}. How many elements does the power set 2s  contain ?

a) 1 b) 6 c)4 d)8

28. For the relation S = {(1, 2), (3, a), (b, α) ,(β, Joe)} Find out D(S), R(S)

a) D(S) = {1, 3, b, 2} and R(S) = {2, a, α, Joe}

b) D(S) = {1, 3, b, β} and R(S) = {2, a, α, Joe}

c) D(S) = {1, 3, b, β} and R(S) = {2, a, α, 2}

d) D(S) = {1, 3, b, 2} and R(S) = {2, a, α, 2}

29. The range R of a binary relation S is the set of all ----------------of the ordered pairs in the

relation.

a)first elements b)third element

c) second elements d)sixth element

30. 4. A relation R in a set X is symmetric if \_\_\_\_\_\_\_\_.

a) xry, yrz => xrz. b) xry

c) xry=>yrx d) xrx

31. If R is reflexive, symmetric and transitive then the relation is said to be \_\_\_\_\_\_\_\_.

a) binary relation b) compatibility relation

c)equivalence relation d) partial order relation

32. A partial order relation ≤ on a set P can be represented by means of a diagram known as

a------ of (P, ≤).

a)matrix b)graph

c) Hasse d) binary relation

33. A mapping f: A→ B is called onto (surjective) if for every b Є B there is an a Є A such that f

*a) = B. a) one to one* b) onto

c)constant mapping d) identity mapping

34. A mapping f: A→A is called the --------of A if f (a) = a, for all a∈A.

a)inverse functions b) identity mapping

c) function d)Constant mapping

35. A mapping f: A → B is called one-to-one (injective or 1 –1) if distinct elements of A are

mapped into distinct elements of B.

a) one-to-one b)surjective

c)onto d)into

36. If f: A→B and g: B→C are two functions, then the composition of functions f and g, denoted by-----------

a)G o f b)g o F

c) g o f d) G o F

37. Let f: A→ B be a one-to-one and onto mapping. Then, its inverse, denoted by ------

a) f -1 b) f

c)R+ d)R

38. The composition of function is associative but not \_\_\_\_\_\_\_.

a)commutative b) associative

c) distributive d) idempotent

39. A mapping f: R→ b is called a ----------------if, for all a∈A, f (a) = b, a fixed element.

a) bijective b) constant mapping

c) onto mapping d) identity mapping

40. A partial order relation is denoted by the symbol----.

a) = b) ≤ c) ╪ d) <

**UNIT- III**

41. The greatest lower bound of a subset {a, b} ⊆ L is denoted by \_\_\_\_\_\_\_\_\_\_\_\_\_

a. a \* b b. a ⊕ b c. a ∩ b d. a ∪ b

42. The least upper bound of a subset {a, b} ⊆ L is demoted by\_\_\_\_\_\_\_\_

a. a \* b b. a ⊕ b c. a ∩ b d. a ∪ b

43. \_\_\_\_\_\_\_\_\_\_\_ is used to denote the meet of two elements.

a. ˄ b. • c. \* d. all of these

44. \_\_\_\_\_\_\_\_ is used to denote the join of two elements.

a. ˄ b. + c. ⊕ d. all of these

45. A totally ordered set is trivially \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a. poset b. lattice c. LUB d. GLB

46. All partially ordered sets are \_\_\_\_\_\_\_\_\_\_

a. lattice b. not lattice c. poset d. totally ordered set

47. For a, b, c ∈<L, ≤ >, a\*(a ⊕ b) = \_\_\_\_\_\_\_

a) a b) b c) a \* b d) a + b

48. A lattice with three or fewer elements is \_\_\_\_\_\_\_\_\_\_\_\_

a. lattice b. isotonicity c. chain d. duality

49. In a lattice if a ≤ b ≤ c then a ⊕ b = \_\_\_\_\_\_\_\_\_\_\_\_

a) b \* a b. a \* c c. b \* c d. b ⊕ c

50. In a lattice if a ≤ b ≤ c then (a \* b) ⊕ (b \* c) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_

a) a b) b c) c d) a ⊕ b

51. In a lattice if a ≤ b ≤ c then (a ⊕ b) \* (a ⊕ c) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_

a) a b) b c) c d) a \* b

52. Every finite subset of a lattice has \_\_\_\_\_\_\_\_\_\_\_\_

a. LUB b. G LB c. both a & b d. none of these

53. A lattice is called \_\_\_\_\_\_\_\_\_ if each of its non empty subsets has a LUB and GLB.

a. bounded b. complemented c. distributive d. complete

54. A lattice < L, \*, ⊕, 0, 1 > is said to be \_\_\_\_\_\_\_\_\_\_\_ lattice if every element of L had at least one complement.

a. distributive b. complement c. complete d. commutative

55. Every \_\_\_\_\_\_\_\_\_\_\_ is a distributive lattice.

a. commutative lattice b. chain

c. idempotent d. associative lattice.

56. The direct product of any two distributive lattices is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lattice.

a. Commutative b. associate c. idempotent d. distributive

57. a ⊕ a = a is called \_\_\_\_\_\_\_\_\_\_\_\_ property.

a. absorption b. associate c. Idempotent d. distributive

58. If < L, \*, ⊕ > is a distributive lattice, for any a, b, c ∈ L, then

(a \* b = a \* c) ˄ (a ⊕ b = a ⊕ c ⇒ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

a) a = b b) a = c c) b = c d. b ≠ c

59. Every distributive lattice is \_\_\_\_\_\_\_\_\_\_\_\_\_

a. Chain b. modular c. complement d. complete

60. A bounded distributive lattice, the elements which have complements form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a. lattice b. sub-lattice c. complemented lattice d. modular

**UNIT - IV**

61. An edge having the same vertex as both its end vertices is called\_\_\_\_\_\_\_\_\_\_\_\_

(a) Circuit (b) self loop (c) linear complex (d) element

62. A graph that has neither self-loops nor parallel edges is called \_\_\_\_\_\_\_\_\_\_

(a) simple graph. (b) Euler graph (c) complete graph (d) infinite graph

63. A graph is also called \_\_\_\_\_\_\_\_\_\_\_

(a) branch (b) line (c) junction (d) one-dimensional complex

64. The number of edges incident on a vertex with self loops counted twice is called \_\_\_\_\_\_\_\_

(a) finite graph (b) adjacent edge (c) degree of vertex (d) degree of edge

65. A vertex having no incident edge is called \_\_\_\_\_\_\_\_\_\_

(a) an isolated vertex (b) pendent vertex (c) end vertices (d) node

66. A graph in which all vertices are of equal degree is called \_\_\_\_\_\_\_\_\_\_\_\_

(a) Euler graph (b) connected graph (c) disconnected graph (d) regular graph

67. The degree of a vertex is sometimes also referred to as its \_\_\_\_\_\_\_\_\_\_\_\_

(a) pendent vertex (b) arc (c) unicursal graph (d) valency

68. More than one edge associated with a given pair of vertices such edges is called \_\_\_\_\_\_\_

(a) parallel edges (b) loop (c) edge disjoint (d) branch

69. Sub graphs that do not even have vertices in common are said to be \_\_\_\_\_\_\_\_\_

(a) vertex disjoint (b) edge disjoint (c) circular path (d) intermediate vertex

70. The number of edges in a path is called the \_\_\_\_\_\_\_\_\_

(a) height of a graph (b) length of a path (c) length of walk (d) length of a cycle

71. Some closed walk in a graph contains all the edges of the graph, such a walk is called as

(a) Closed walk (b) open walk (c) an Euler line (d) Fusion

72. A simple graph in which there exist an edge between every pair of vertices is called as

(a) Unicursal graph (b) Hamiltonian circuit (c) Arbitrary traceable graph (d) complete graph

73. A compete graph is sometimes also referred to as a \_\_\_\_\_\_\_\_\_\_\_\_

(a) clique (b) Hamiltonian path (c) circuit path (d) polygon

74. The length of a Hamiltonian path in a connected graph of n vertices is \_\_\_\_\_\_\_\_

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

75. Eccentricity of center in a tree is defined as the \_\_\_\_\_\_\_\_\_\_\_\_\_ of a tree.

(a) Diameter (b) root (c) labeled (d) radius

76. A nonpendant vertex in a tree is called \_\_\_\_\_\_\_\_\_\_

(a) external vertex (b) internal vertex (c) free tree (d) isolated vertex

77. A graph in which each vertex is assigned a unique name is called a \_\_\_\_\_\_\_\_\_\_

(a) labeled graph (b) regular graph (c) spanning tree (d) complete graph

78. Addition of a chord and deletion of an appropriate branch is called a \_\_\_\_\_\_\_\_

(a) cyclic change (b) cyclic modify (c) cyclic interchange (d) cyclic terminate

79. Adding a chord to a spanning tree is called a \_\_\_\_\_\_\_\_\_\_\_\_

(a) binary tree (b) fundamental circuit (c) elementary tree (d) minimal spanning tree

80. An edge of G that is not in a given spanning tree T is called a \_\_\_\_\_\_\_\_\_

(a) cotree (b) branch (c) chord (d) tie set

**UNIT- V**

81. A cut-set always “cuts” a graph into \_\_\_\_\_\_

(a) four (b) two (c) three (d) five

82. The ring sum of any two cut-sets in a graph is either a third cut-set or an edge disjoint \_\_\_\_\_\_\_ of cut sets.

(a) Intersection (b) union (c) fusion (d) deletion

83. Every cut-set in a connection graph in G must contain at least \_\_\_\_\_\_\_ branch of every spanning tree of G.

(a) Zero (b) one (c) two (d) three

84. The number of edges in the smallest cut-set is defined as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of G.

a. edge connectivity b. vertex connectivity

c. Separable d. all the above

85. The number of vertices in the smallest cut-set is defined as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of G.

a. edge connectivity b. vertex connectivity

c. Separable d. all the above

86. A connected graph is separable if its vertex connectivity is \_\_\_\_\_\_\_\_\_\_

a.zero b. two

c. three d. one

87. In a separable graph a vertex whose removal disconnects the graph is called \_\_\_\_\_\_\_\_\_

a. cut-edge b. cut-matrix

c. articulation point d. vertex connectivity

88. Every \_\_\_\_\_\_\_\_\_\_ in a non separable graph with more than two vertices contains at least

two edges.

a. cut-edge b. cut-matrix

c. cut-set d. vertex connectivity

89. The incidence matrix contains only two elements 0 and1, such a matrix is called as

a. unary matrix b. trinary matrix

c. rank matrix d. binary matrix

90. In an incidence matrix, a row with all 0’s represents an \_\_\_\_\_\_\_\_\_\_\_

a. isolated matrix b. pendent matrix

c. degree d. all the above

91. In an incidence matrix, a row with number of 1’s \_\_\_\_\_\_ of the corresponding vertex.

a. isolated matrix b. degree

c. pendent matrix d. all the above

92. In an incidence matrix, identical columns represents \_\_\_\_\_\_\_\_\_

a. self loop b. parallel edges

c. edge disjoint d. pendent vertices

93. If A(G) is an incident matrix of a connected graph with n vertices, the rank of A(G) is

a. n+1 b. n

c. n-1 d. n-2

94. In circuit matrix, a non circuit edge means a column of \_\_\_\_\_\_\_\_\_\_\_\_

a. all ones b. two ones

c. two zeros d. all zeros

95. In cut-set matrix, a column with all 0’s corresponds to an edge forming a \_\_\_\_\_\_\_\_\_\_

a. parallel edges b. isolated vertex

c. self loop d. isomorphic

96. An adjacent matrix representation of a graph cannot contain information of \_\_\_\_\_\_\_

a. node b. edges

c. parallel edges d. direction of edges

97. In a path matrix, there is no row with all \_\_\_\_\_\_\_

a. 0’s b. 1’s c. two 1’s d. two 0’s

98. In a path matrix, the ring sum of any two rows in P(x, y) corresponds to a \_\_\_\_\_\_\_\_\_\_\_

a. self loop b. direction of edge c. edge d. circuit

99. In adjacency matrix, diagonal of X are all 0’s if and only if the graph has \_\_\_\_\_\_\_\_\_

a. self loop b. parallel edges c. no self loop d. no parallel edges

100. \_\_\_\_\_\_\_\_\_ produces identical columns in the cut-set matrix.

a. Self loop b. Parallel edges c. Isolated vertex d. Pendent edges

**Answers with Expansion**

**UNIT - I**

1. (a) Combine

2. (c)atomic

3. (a) Capital Letter

4. (b)unary operator

5. (c) True & False

6. (d) All of thesel

7. (a) Anticedent

8. (b) P if and only if Q

9. (a) AND

10. (a) molecular

11. (a) elementary sum

12. (a) elementary product

13. (a) Conjunction

14. (b) Distributive laws

15. (a) disjunction

16. (a) a tautology

17. (a) Rule P

18. ( b)p V s

19. (b) *tautology*

20. (b) product of sum canonical form

21. (a) null set

22. (b) finite set

23. (c) A ⊆ B and A ╪ B

24. (d) B – A

25. (b) absolute complement

26. (d) Cartesian product

27. (c) 4

28. (b) D(S) = {1, 3, b, β} and R(S) = {2, a, α, Joe}

29. (c) second elements

30. (c)xry=>yrx

31. (c) equivalence relation

32. (c) Hasse

33. (b) onto

34. (b) identity mapping

35. (a) one-to-one

36. (c) g o f

37. (a) f -1

38. (a) commutative

39. (b) constant mapping

40. (b) ≤

**UNIT - III**

41. (a) a \* b

42. (b) a ⊕ b

43. (d) all of these

44. (d) all of these

45. (b) lattice

46. (b) not lattice

47. (a) a

48. (c) chain

49. (c) b \* c

50. (b) b

51. (b) b

52. (c) both a & b

53. (d) complete

54. (b) complemented

55. (b) chain

56. (d) distributive

57. (a) absorption

58. (c) b = c

59. (b) modular

60. (b) sub-lattice

**UNIT - IV**

61. (b) self loop

62. (a) simple graph

63. (d) one-dimensional complex.

64. (c) degree of vertex

65. (a) an isolated vertex

66. (d) regular graph

67. (d) valency

68. (a) parallel edges

69. (a) vertex disjoint

70. (b) length of a path

71. (c) an Euler line.

72. (d) complete graph.

73. (a) clique

74. (b) n-1

75. (d) radius.

76. (b) internal vertex

77. (a) labeled graph.

78. (c) cyclic interchange.

79. (b) fundamental circuit

80. (c) chord.

**UNIT - V**

81. (b) two

82. (b) union.

83. (b) one

84. (a) edge connectivity.

85. (b) vertex connectivity.

86. (d) one.

87. (c) articulation point.

88. (c) cut-set.

89. (d) binary matrix.

90. (a) isolated matrix.

91. (a) isolated matrix.

92. (b) parallel edges.

93. (c) n-1.

94. (d) all zeros.

95. (c) self loop.

96. (c) parallel edges.

96. (c) parallel edges.

97. (a) 0’s.

98. (d) circuit.

99. (d) no parallel edges.

100. (b) Parallel edges.