(FOR THE CANDIDATES ADMITTED

DURING THE ACADEMIC YEAR 2023 ONLY)   REG.NO. :

23UDA1A1

N.G.M. COLLEGE (AUTONOMOUS) : POLLACHI
END-OF-SEMESTER EXAMINATIONS: NOVEMBER 2023

BSC.COMP.SCIENCE WITH DA(SF)   **MAXIMUM MARKS: 75**

SEMESTER:1   **TIME: 3 HOURS**

PART - III
23UDA1A1 – ALLIED I:MATHEMATICAL FOUNDATIONFOR DATA SCIENCE

SECTION – A   (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.   **(K1)**

1. Which of the following is/are tautology?

   a) a v b → b ^ c   b) a ^ b → b v c   c) a v b → (b → c)   d) None of these

2. How many binary relations are there on a set S with 9 distinct elements?

   a) 2^{90} b) 2^{100} c) 2^{81} d) 2^{60}

3. A function is invertible if it is _____

   a) surjective   b) bijective   c) injective   d) neither surjective nor injective

4. If the origin and terminus of a walk are same and then the walk is known as...?
   a) Open   b) Closed   c) path   d) None of these

5. The a minimal spanning tree of a graph G is_____

   a) A spanning sub graph   b) A tree   c) Minimum weights   d) All of above

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES   **(K2)**

6. Define duality law

7. Define binary relation

8. Define any one general form of composite functions

9. What is meant by degree of a vertex?

10. Define properties of trees

SECTION – B   (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K3)

11. a) Describe disjunctive normal forms

(OR)

   b) List the rules of inference

12.a) Discover the properties of binary relations in a set

(OR)

   b) Describe the main idea of partial ordering

13.a) Solve inverse of the function $f(x) = \ln (x - 2)$

(OR)

  b) Describe how would you organize peano axioms?

14.a) Compare the finite and infinite graph

(OR)

  b) Show a graph is disconnected graphs

15.a) Describe the basic terms used in tree

(OR)

  b) Describe the rooted trees with diagram

SECTION – C   (5 X 8 = 40 MARKS)
ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.
(K4 (Or) K5)

16. a) Analysis the Conjuctive normal forms with example.

(OR)

  b) Compute an expression $(X \wedge Y) \vee (\neg X \wedge Z) \vee (Y \wedge Z)$, and we have to determine the PDNF with the help of truth table

17. a) Construct the Relation matrix on a graph with an example.

(OR)

  b) Consider $A = \{2, 3, 4, 5\}$ and $R = \{(5, 5), (5, 3), (2, 2), (2, 4), (3, 5), (3, 3), (4, 2), (4, 4)\}$. Confirm that R is an equivalence type of relation

18. a) Evaluate composition of functions with an example.

(OR)

  b) Point out the salient features of functions

19.a) A newspaper agent daily drops the newspaper to the area assigned in such a manner that he has to cover all the houses in the respective area with minimum travel cost. Compute the minimum travel cost. The area assigned to the agent where he has to drop the newspaper is shown in fig:
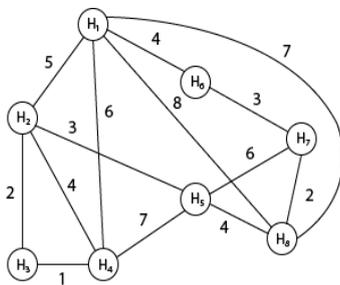
(OR)

  b) Explain the connected graphs and graph components with example.

20.a) Examine the spanning trees with suitable example.

(OR)

  b) Point out the distance and centers in a tree with example tree structure.

ETHICAL PAPER

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