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IV Semester B.C.A. Degree CBCSS (OBE) Regular Examination, April 2021 (2019 Admission Only) **General Awareness Course**

4A 14 BCA: DISCRETE MATHEMATICAL STRUCTURES

Time: 3 Hours Max. Marks: 40 17. Prove that the theorem: Let (: A B th A - TRA9 both one-one and onto functions (Short Answer) and end-end calls at O A stop ment

Answer all questions.

(0+19)(0+9)(0+9)=(0+16)

- 1. A set with no elements is called ___
- 2. Define proposition. B. E. B. E. B. E. B. The adjacency structure of a graph G is given as G = [A : B, E : B. The adjacency structure of a graph G is given as G = [A : B, E : B. E. B. The adjacency structure of a graph G is given as G = [A : B, E : B. E. B. The adjacency structure of a graph G is given as G = [A : B, E : B. E. B. The adjacency structure of a graph G is given as G = [A : B, E : B. E. B. The adjacency structure of a graph G is given as G = [A : B, E : B. E. B. The adjacency structure of a graph G is given as G = [A : B, E : B. E. B. The adjacency structure of a graph G is given as G = [A : B, E : B. E. B. The adjacency structure of a graph G is given as G = [A : B, E : B. E. B. The adjacency structure of a graph G is given as G = [A : B, E : B].
- 4. Define onto mapping.
- 5. Let G = (V, E) be a graph. If the elements of E are ordered pairs of vertices, then the graph G is called ____
- 6. What is planar graph?

PART - B (Short Essay) and play of a disgree horized adhose 0.00

Answer any 6 questions.

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- 7. Determine the truth table of ~p (q p). The second of th
- 2. Let p be "it is cold" and q be " it is raining". Give a simple verbal sentence which describes each of the following:

a. ~p

b. ~p ∧ ~q

- 9. Define Hasse diagram.
- 10. Define relation from A to B with example.
- 11. Describe laws of Boolean Algebra.
- 12. Simplify F = + + A + AB.
- 13. Define complete graph with example.
- 14. What is graph coloring?

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PART - ((Essay)

Answer any 4 questions.

 $(4 \times 3 = 12)$

- 15. Prove that $(p \land q)$ p is tautology.
- 16. A = {1, 2}, B = {1, 2, 4, 5}, C = {5, 7, 9, 10}. Find the following :
 - a) $(A \cup B) \cup C$
 - b) $(A \cap B) \cap C$
 - c) $(A \cup B) \cap C$.
- 17. Prove that the theorem : Let f : A B then g : B be both one-one and onto functions, then gof : A C is also one-one and onto.
- 18. Simplify Y = (P + Q) (P + Q') (P' + Q).
- 19. Prove that K₅ is non planar graph.
- 20. The adjacency structure of a graph G is given as G = [A : B, E; B : A, E, F, G; C : D, G, H; D : C, H; E : A, B; F : G; G : B, C, F; H : C, D].

PART – D

Legothovilo ausq beredio ets (Long Essay) ett il inderg s ed (E.M). = 2 tell

Answer any 2 questions.

 $(2 \times 5 = 10)$

13. Define complete graph with example

Canswer all guestions

- 21. Compare DFS and BFS graph.
- 22. Describe shortest paths in weighted graphs.
- 23. Without using truth tables prove that $(\neg p \lor q) \land (p \land (p \land q)) = p \land q$.
- 24. Write down the properties of Union operations in sets. I along the properties of Union operations in sets.