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18/104-C

B.C.A. (Second Semester) (Regular/ Back) Examination, 2018

Paper : Fourth

(BCA-204)

Discrete Mathematics

Time : Three Hours] *[Maximum Marks : 70*

Note : Attempt questions from **all** sections as per instructions.

Section-A

Note : Attempt **all** parts of this question. 10×1½=15

1. (a) What do you mean by power set? Explain with example.

   (b) Perform cartesian product of two set A and B i.e.

   A={1, 3, 5, 7} and B={2, 4, 6, 8}

P.T.O.

(c) Define the term Group and sub-group.

(d) Explain about Ring and field.

(e) What do you mean by Multigraph? Explain.

(f) Differentiate walk, path and circuit.

(g) Define hamiltonian graph with an example.

(h) Design an eulerian graph and write its property.

(i) Write two difference between tree and forest.

(j) Write the definition of minimum cost spanning tree.

Section-B

Note : Attempt **all** questions. 7×5=35

2. State and Prove Commutative Law of two finite, non empty sets.

OR

Show that union of two sets are associative.

3. Define predicate logic and predicate calculus in brief.

OR

Explain the "theory of inference" for statement calculus.

4. Define bipartite graph and its property, also design a complete bipartite graph.

OR

What is shortest path problem of a graph? Explain with an example.

5. Explain about traveling Salesman problem.

OR

What do you mean by randomly eulerian graph? Explain.

6. Write the difference between binary tree and binary search tree.

OR

Write prim's algorithm for finding minimum spanning tree.

Section-C

Note : Attempt any **two** questions. $10 \times 2 = 20$

7. Solve $\left(\frac{1}{6}\right)^{-3x-2}$ and prove that if $\left(\frac{1}{6}\right)^{-3x-2} = (36)^{x+1}$ Then $x=0$

8. Write the following equation in log form :

   (i) $2^{-3} = \frac{1}{8}$

   (ii) $\left(\frac{1}{7}\right)^{-2} = 49$

9. Write and briefly explain about Pseudograph and Multigraph with suitable example.

10. Write about Unicursal and eulerian graph. Also write Fleury's algorithm.

11. State and Prove Menger's theorem with suitable example.