

CU UG INTERMEDIATE EXAMINATION-2020

MAHESHTALA COLLEGE

COMPUTER SCIENCE (HONS)

SEMESTER-4, FULL MARKS: 50, TIME: 1 HOUR

PAPER: CC9 (Introduction to Algorithms & its Application. ), Date: 04/12/2020, 2 PM to 3 PM

**PART-A (Theory: 25 Marks)**

**Answer any five question:**

5x5=25

1. Differentiate between Greedy method and Dynamic programming.
2. Define big-oh, big-omega and big-theta notations for complexity analysis.
3. Write Prim's algorithm to find out the minimum spanning tree from a weighted connected graph.
4. Write Dijkstra's algorithm to find out shortest distance and path from a fixed vertex to any vertex in a weighted connected graph.
5. Define small-oh and small-omega notation for complexity analysis.
6. Discuss the Divide and Conquer approach using Merge sort.
7. If  $f(n)=n^2$  and  $g(n)=\log(n)$  then show that  $f(n)=\omega(g(n))$ .  $\omega$  represents small omega.
8. Discuss briefly about Matrix chain Multiplication technique with a suitable example.
9. Write the Warshal algorithm to find out transitive closure of a relation.

**PART-B (Internal Assessment: 10 Marks)**

**Answer any five questions**

5x2=10

1. What is graph colouring ?
2. What is chromatic number?
3. Define minimum spanning tree?
4. What do you mean by Divide and Conquer strategy?
5. What is NP-Hard problem?
6. What is NP-Complete problem?
7. Differentiate between BFS and DFS graph traversal algorithm.
8. Write the advantages of Dynamic programming.

**PART-C (Practical: 15 Marks) (Write in separate sheet and send in a separate file)**

**Answer any one**

1. Write a C-program to find out the shortest path and shortest distance between every pair of vertices in a weighted connected graph using Floyd's algorithm.
2. Write a C-program to find out the minimum spanning tree in a weighted connected graph using Prim's algorithm.
3. Write a C-program to implement graph colouring using backtracking method.
4. Write a C-program to find out the minimum spanning tree in a weighted connected graph using Kruskal's algorithm.