Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

MCA (Sem.–1)

ADVANCED DATA STRUCTURES

Subject Code : PGCA-1952

M.Code : 79037

Date of Examination : 02-01-2025

Time : 3 Hrs. **Max. Marks : 70**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION - B & C have FOUR questions each.**
3. **Attempt any FIVE questions from SECTION B & C carrying TEN marks each.**
4. **Select atleast TWO questions from SECTION - B & C.**

SECTION-A

l. Write short notes on :

a) Show that left and right rotations are inverses of each other. What can you say about double rotations?

b) Which algorithm works with negative edges and Why?

c) What is Pivot element? What is its importance?

d) What is bucket sorting?

e) What is string matching? Give example.

f) What is the difference between shortest path and minimal spanning tree?

g) What are B-trees?

h) What do you mean by an adjacency matrix? Give example.

i) How is the growth rate of an algorithm determined?

j) What is maximum flow problem?

SECTION-B

2. Insert the following keys in the height balanced trees, showing all the intermediate steps

   342, 206, 444, 523, 607, 301, 142, 183, 102, 157 and 149.

3. Write an algorithm for quick sort and apply the same on the following sequence.

   8 5 7 3 2 1 6 4 9

4. Compare chaining and open addressing techniques of collision resolving.

5. What are Red-black trees? Construct a red black tree for the following list with proper rotations and coloring: 7, 5, 6, 3, 9, 14, 15

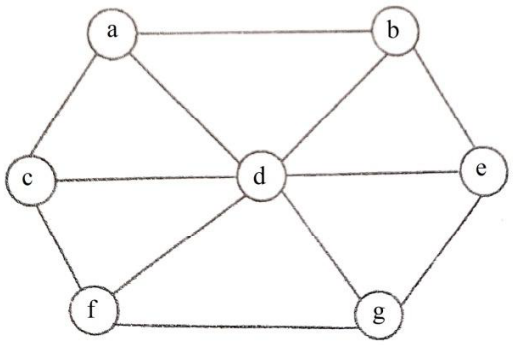
SECTION-C

6. Explain the Rabin-Karp algorithm in detail.

7. Write an algorithm to solve APSP problem.

8. What do you mean by a spanning tree? Explain the Kruskal's algorithm used to find out the minimum spanning tree of a graph with the help of a suitable example.

9. Draw five spnning trees from the following graph:



NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.