Roll No. | | | | | | | | |

Total No. of Questions : 09

Total No. of Pages : 02

MCA (Sem.–1)

ADVANCED DATA STRUCTURES

Subject Code : PGCA-1952

M.Code : 79037

Date of Examination : 21-12-2023

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

I) **Write short notes on :**

a. What do you mean by amortized analysis?

b. What is the worst case time complexity of merge sort?

c. What are the characteristics of a good hash function?

d. What is the worst case time complexity of counting sort algorithm?

e. What are the four rotations of AVL tree?

f. What is minimum spanning tree?

g. What is maximum flow

h. What is string copy?

i. How to concatenate two strings? Explain.

j. What is the time complexity of Rabin Karp algorithm?

SECTION-B

2) **Answer the following :**

a. Consider a hash table with 10 slots and the collisions are resolved by linear probing. The following keys are inserted in the order: 15, 2, 1, 5, 20, 31, 12, 21, 17 and 34. The hash function is h(k)=k mod 10. What is the resultant hash table?

b. What is perfect hashing? Explain.

3) a. Show the red-black trees that result after successively inserting the keys 41,38,31,12,19,8 into an initially empty red-black tree.

b. Explain disjoint-set data structures using an example.

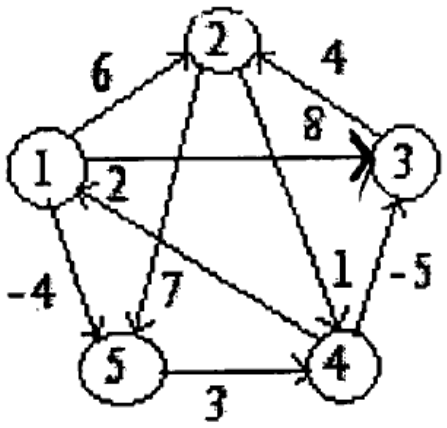
4) What is the difference between counting sort and bucket sort? Explain with the help of an example.

5) What are the methods of amortized analysis? Explain in detail.

SECTION-C

6) How graphs are represented in memory? Explain in detail.

7) Apply all pairs shortest algorithm for constructing the shortest path for the following graph.



8) What is the good suffix rule in Boyer-Moore algorithm? Explain in detail with the help of an example.

9) What is prefix function in Knuth-Morris-Pratt algorithm? Explain in detail.

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