Reg No:

MCA DEGREE EXAMINATION, JUNE 2023

Second Semester

Data Structure
(CBCS Y2K20 Scheme)
2021 Admission Onwards

Time: 3 Hours   Max Mark: 70

Part A (Short Essay Questions)
Answer any five questions
Weight **6** each

1. Differentiate linear and non-linear data structure.
2. Program that implements depth first search algorithm.
3. Given the input { 4371, 1323, 6173, 4199, 4344, 9679, 1989 } and a hash function of h(X)=X (mod 10) show the resulting: a. Separate Chaining hash table b. Open addressing hash table using linear probing
4. Explain greedy algorithm.
5. Program to find the minimum cost of a spanning tree
6. (i) write an algorithm to determine the biconnected components in the given graph.
(ii)determine the biconnected components in a graph.
7. what are the advantages and disadvantages of various collision resolution strategies?
8. Explain linear linked implementation of Stack and Queue? a. Write an ADT to implement stack of size N using an array. The elements in the stack are to be integers. The operations to be supported are PUSH, POP and DISPLAY. Take into account the exceptions of stack overflow and stack underflow. b. A circular queue has a size of 5 and has 3 elements 10,20 and 40 where F=2 and R=4. After inserting 50 and 60, what is the value of F and R. Trying to insert 30 at this stage what happens? Delete 2 elements from the queue and insert 70, 80 & 90. Show the sequence of steps with necessary diagrams with the value of F & R.

Part B (Essay Questions)
Answer any four questions
Weight **10** each

9. What does Kruskals's algorithm do?
10. Articulation Points (or Cut Vertices) in a Graph
11. Give mode of operation in Dijkstra's algorithm .
12. What are the postfix and prefix forms of the expression? A+B*(C-D)/(P-R)
13. Write short notes on i. Binomial heaps ii. Fibonacci heaps
14. Write a function called 'push' that takes two parameters: an integer variable and a stack into which it would push this element and returns a 1 or a 0 to show success of addition or failure.
15. Write BFS algorithm