

FACULTY OF SCIENCE

B.Sc. (CBCS) III - Semester Examination, November/December 2019

Code No.8078

Subject: Computer Science (Data Structures)
Paper: III (DSC)

Time: 3 Hours

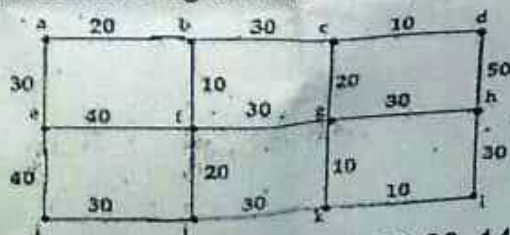
Max. Marks: 80

Part - A (5x4 = 20 Marks)
(Short Answer Type)✓ **Note: Answer any FIVE of the following questions.**

1. Define data structure and describe the types of data structure. ✓
2. What is stack? List out applications of stack. ✓
3. Why linked list is called dynamic data structure? What are the advantages of using linked list over arrays? ✓
4. Describe execution of recursive calls with example. ✓
5. What are the binary tree applications? ✓
6. Define graph and explain graph representation.
7. Write a program for sequential search. ✓
8. What is heap? Explain heap construction process? ✓

Part - B (4x15 = 60 Marks)
(Essay Answer Type)**Note: Answer ALL the following questions.**

9. (a) (i) What is an array and explain its advantages and disadvantages?
(ii) Explain memory representation and address calculation of 1-D and d-D arrays.
- OR
- (b) Write a program to implement the stack abstract data type using an array.
10. (a) (i) What is recursion and write an example for recursion?
(ii) What is queue? And explain about circular queue and double ended queue.
- OR
- (b) Write a program to create a double linked list insert, delete and search for an element operations.
11. (a) (i) Define the binary tree and explain its properties. Explain the binary tree traversal techniques with example.
(ii) Write a program to travel binary tree in pre-order, post-order and in-order.
- OR
- (b) What is spanning tree and minimum spanning tree? Construct minimum spanning tree using kruskal's algorithm.



12. (a) (i) Sort the given list of numbers 76, 67, 36, 55, 23, 14, 6 using insertion sort.
(ii) Write a program for sorting the numbers in ascending order using bubble sort.
- OR
- (b) Explain the merge sort technique and write a program for sorting the numbers in ascending order using merge sort.