

B.E. (Computer Technology) Fourth Semester (C.B.S.)
Data Structure & Program Design Paper - II

P. Pages : 2

Time : Three Hours



TKN/KS/16/7377

Max. Marks : 80

- Notes :
1. All questions carry marks as indicted
 2. Solve Question 1 OR Questions No.2.
 3. Solve Question 3 OR Questions No.4.
 4. Solve Question 5 OR Questions No.6.
 5. Solve Question 7 OR Questions No.8.
 6. Solve Question 9 OR Questions No.10.
 7. Solve Question 11 OR Questions No.12.
 8. Due credit will be given to neatness.

1. a) Suppose A array contains 8 elements as follows : 8,6,22,11,2,66,5,9, sort array 'A' using selection sort method. Also discuss its time complexity. **6**
- b) Explain the following terms: **8**
- i) Data structure and its types
 - ii) Abstract data type.
 - iii) Flowchart and its symbols.
 - iv) Time and space complexity.
- OR**
2. a) Write a program to implement merge sort. Also discuss its complexity. **8**
- b) What do you mean by analysis of algorithm? Explain different asymptotic notations used for analysis of algorithm. **6**
3. a) Write short notes on:- **9**
- i) Multiple stacks
 - ii) Circular queue.
 - iii) Priority queue.
- b) Write algorithm for PUSH and POP operation on stack. **4**
- OR**
4. a) Write a program to implement various operations on queue. **7**
- b) Covert given infix expression to postfix expression by using stack. **6**
- i) $A + B \uparrow C$
 - ii) $(A + B * C) / (D - E) + F$
 - iii) $(A - B) / D + (F * A * D)$
5. a) Write "C" functions to perform following operations on singly linked list: **8**
- i) Insert node at beginning.
 - ii) Insert node at end.
 - iii) Traverse the linked list.
- b) Explain various types of linked list with proper representation and example. **5**
- OR**
6. a) Give suitable representation for polynomials and write on algorithm to add two polynomials. **6**

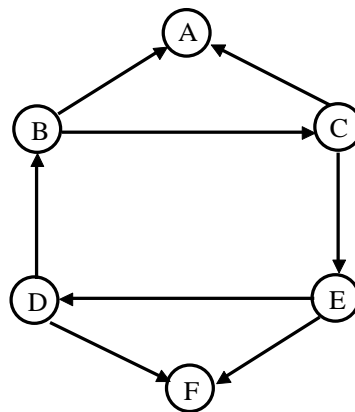
- b) What is Doubly linked list? Write an algorithm to reverse the links of doubly linked list. 7
7. a) Write an algorithm for preorder traversal of binary tree (Non-recursive) 7
- b) What is Binary search tree? For the given, sequence, create a binary search tree 60,25,75,50,66,15,33,44. 7

OR

8. a) Define following terms with its example. 14
- | | |
|-------------------------|---------------------------|
| i) Tree | ii) Binary tree |
| iii) Binary search tree | iv) Strictly binary tree. |
| v) Full binary tree | vi) Complete binary tree. |
| vii) AVL tree. | |
9. a) Define graph what are different types of graphs and different ways of representation of graphs? Explain each with suitable example. 7
- b) Explain prims algorithm to find minimum cost spanning tree with suitable example. 6

OR

10. a) For the following graph, write:- 7
- i) In degree and out degree of each vertex.
 - ii) Adjacency matrix.
 - iii) Adjacency list
 - iv) Adjacency multilist representation.



- b) Write an algorithm for BFS. 6
11. a) What is hashing? Explain division method of hashing to store the following values in hash table. 7
- 25,45,96,101,102,162,197,201
- b) Discuss fundamental file organization techniques. Discuss their merits and demerits. 6

OR

12. a) Write short notes on the following:-
- a) Storage structure on tapes and disks. 3
 - b) Indexed sequential file. 3
 - c) Direct access file. 3
 - d) External sorting method. 4
