

Scheme - I
Sample Question Paper

Program Name : Computer Engineering Program Group
Program Code : CO/CM/IF/CW
Semester : Third
Course Title : Data Structures Using 'C'
Marks : 70

22317

Time: 3 Hrs.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following.

10 Marks

- a. Write any four applications of data structure.
- b. Sketch the diagram of circular queue.
- c. State the following terms: 1. Ancestor 2. Height of Degree
- d. Show the memory representation of Stack using array with the help of a diagram.
- e. Define Abstract Data Type.
- f. Convert the following infix expression to its postfix form using stack
$$A + B - C * D / E + F.$$
- g. Describe given two types of graphs: Directed and undirected graph.

Q.2) Attempt any THREE of the following.

12 Marks

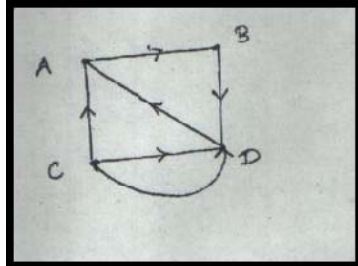
- a. Explain the working of Radix Sort Method with an example.
- b. Write algorithm to delete an intermediate node from a Singly Linked List.
- c. Explain stack overflow and underflow conditions with example.
- d. Differentiate between tree and graph w.r.t. any 4 parameters.

Q.3) Attempt any THREE of the following.

12 Marks

- a. Implement C Program for performing following operations on Array : Insertion, Display.
- b. Convert the following infix expression to its prefix form using stack $A + B - C * D / E + F.$ Show diagrammatically each step of conversion.

- c. Sort the following numbers in ascending order using Insertion sort. Given Numbers :
348, 14, 614, 5381, 47 and Write the output after each iteration .
- d. For the following directed graph :
- Give adjacency matrix representation.
 - Give adjacency list representation.



Q.4) Attempt any THREE of the following.

12 Marks

- Differentiate between Binary Search and Sequential Search.
- Construct the binary search tree using following elements:
35,15,40,7,10,100,28,82,53,25,3. Show diagrammatically each step of construction of BST.
- Create a Singly Linked List using data fields 10, 20, 30, 40, 50 and show procedure step-by-step with the help of diagram from start to end.
- Show the effect of INSERT and DELETE operations on to the Linear queue of size 10. The Linear queue sequentially contains 10, 20, 30, 40, and 50 where 10 is at front of the queue. Show diagrammatically the effect of -
 - INSERT (12)
 - INSERT (34)
 - DELETE
 - INSERT (56)
- Create a Singly Linked List using data fields 10, 20, 30, 40, 50 and show procedure step-by-step with the help of diagram from start to end.

Q.5) Attempt any TWO of the following.

12 Marks

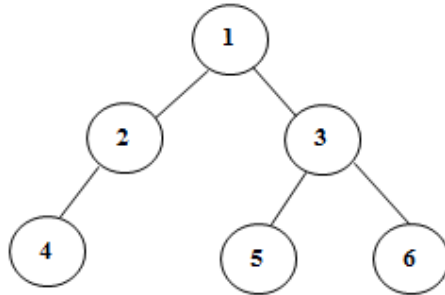
- Show the effect of PUSH and POP operation on to the stack of size 10. The stack contains 10, 20, 22, 26, 28, and 30, with 30 being at top of the stack. Show diagrammatically the effect of-
 - PUSH 46
 - PUSH 48
 - POP

4.POP

5.POP

Sketch the final structure of Stack after performing the above said operations. Sketch the final structure of Stack after performing the above said operations.

b.



From the given tree complete six answers :

1. Degree of tree :
 2. Degree of node 3 :
 3. Level of node 5 :
 4. Indegree of node 3 :
 5. Outdegree of node 3 :
 6. Height of tree :
- c. Write an algorithm to count number of nodes in singly linked list.

Q.6) Attempt any TWO of the following.

12 Marks

- a. Sort the following numbers in ascending order using Bubble sort. Given Numbers : 348, 14, 614, 5381, 47 and Write the output after each iteration
- b. Evaluate the following prefix expression : $- * + 4 3 2 5$
Show diagrammatically each step of evaluation using stack.
- c. Create a Singly Linked List using data fields 10, 20, 30, 40, 50. Search a node 40 from the SLL and show procedure step-by-step with the help of diagram from start to end.

Scheme – I

Sample Test Paper - I

Program Name : Computer Engineering Program Group
Program Code : CO/CM/IF/CW
Semester : Third
Course Title : Data Structures Using 'C'
Marks : 20

22317

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a) Differentiate between Linear and Non-linear data structures w.r.t. any 2 parameters.
- b) Define searching and give its type.
- c) List any four operations on data structure.
- d) Define sorting and give its type.
- e) Explain the term: time complexity.
- f) List any four sorting techniques.

Q.2 Attempt any THREE.

12 Marks

- a) Implement C Program for performing following operations on Array: Insertion, Display.
- b) With explanation sort the given no. in ascending order using radix sort. Given Numbers : 348, 14, 614, 5381, 47
- c) Find the position of element 29 using binary search method in an array 'A' given below : A = {11, 5, 21, 3, 29, 17, 2, 43}
- d) Write an algorithm for Selection sort.

Scheme – I

Sample Test Paper - II

Program Name : Computer Engineering Program Group
Program Code : CO/CM/IF/CW
Semester : Third
Course Title : Data Structures Using 'C'
Marks : 20

22317

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a) Give any two applications of stack.
- b) Draw the diagram of queue to represent front and rear pointers of queue.
- c) Describe any two terms from the following : Node, Null pointer, empty list with respect to linear linked list with diagram..
- d) Describe any two terms from the following : information Field/ Data field, Address, Next Pointer with respect to circular linked list with diagram..
- e) Give any two applications of Graph.
- f) Describe any two types of trees from the following : General tree, binary tree, binary search tree.

Q.2 Attempt any THREE.

12 Marks

- a) Write algorithm to insert an element into a linear queue.
- b) Convert the following Infix expression to its Postfix form using stack $A + B - C * D / E + F$. Show diagrammatically each step of conversion using Stack.
- c) Create a Singly Linked List using data fields 10,20,30,40,50. And sketch stepwise procedure from start to end.
- d) Construct the binary search tree using following elements : 35,15,40,7,10,100,28,82,53,25,3. Show diagrammatically each step of construction of BST.