5 MARKS

1. Define data structure. How data types are classified? Discuss.

2. Discuss the operations on queues.

3. Write algorithms to insert and delete elements in a circular queue.

4. What are linked lists? How do they differ from arrays?

5. Define Trees, Binary Trees, siblings, ancestors and degree of a tree.

6. How trees can be represented?

7. Write algorithm to convert forest to binary tree and explain.

8. Explain the shortest path algorithm.

9.   What are the operations on an ordered list?

10. Construct an expression tree for the expression :(5-x)*y + 6 / (x + z).

11. Cconvert the ((((A/B)-C + (D*E))-(A*C)) expression into postfix.

12. Briefly explain about the representation of two dimensional arrays.

13. What is Linked List? Explain the different types of Linked list with a neat diagram.

14. Write the procedure for adding and deleting an element in a Queue.

15. What is a Graph? Explain different representations for graphs.

16. Write short notes on Breadth First Search.

17. Write about of Operations in an Array.

18. Explain about Application of Queue.

19. Write a C++ Program for single linked list Insertion.

20. Write a short notes on Binary Tree.

21. Describe the Threaded binary tree.

22. Write an Algorithm for Depth first Traversal.

23. What is composite data types? Explain.

24. Explain about Circular Queue.

25. What is an Array? Explain with an example

26. How data types are classified?

27. Explain the following in stack i) LIFO   ii) Push   iii) Pop   iv) Over Flow v) Under Flow

28. With an example discuss the circular queue.

29. How to add a node at the Beginning of the linked list?

30. Mention the advantages of Doubly linked list

31. Define Binary tree.

32. When a graph is said to be connected or Non-connected?

33. What are primitive and composite data types?

34. Convert the following expression into its post fix form: (i) $1 + 2 * 4 + 3$ (ii) $(((8 + 1) - (7 - 4)) / (11 - 9))$

35. Write a note on singly linked list.

36. How addition and deletion can be done in a circular queue? Explain.

37. Define the following: i) Graph   ii) adjacent vertices iii) directed graph   iv) undirected graph   v) weighted graph

38. Draw the internal memory representation of the following figure using array and linked representation.

39. Describe the conversion of forest to binary tree.

40. Explain an algorithm for finding the shortest path.

10 Marks

1. Describe the operations on arrays.

2. How infix expressions can be converted into postfix? Explain with an example.

3. How polynomials can be represented using linked lists?

4. Give a detailed description about doubly linked lists.

5. Discuss in detail binary tree traversals.

6. Explain binary tree representations.

7. Write a detailed note on graphs.

8. Write the algorithm to add two polynomials and explain.

9. Write the procedure to add two polynomials with an example.

10. Explain the operations performed on stacks and queues.

11. Write and explain an algorithm to add a node to a doubly linked list

12. Write a recursive algorithm for binary tree traversals with an example.

13. Write an algorithm to convert infix to postfix expression.

14. Explain about the algorithm to find the shortest path in a graph with an example.

15. Write short notes on (i) Conversion of forest to a binary tree. (ii) Circular queue.

16. Write the procedure for depth first search of a graph with an example.

17. What is an Ordered list? Explain and its Operations.

18. Write a C++ Program for PUSH and POP Operation

19. Write a C++ Program for to adding and deleting elements from the Double linked list.

20. Discuss about binary Tree Representations.

21. How to convert forest to binary tree? Explain.

22. Write an Algorithm for Shortest path Routing.

23. Describe the graph Representations.

24. Explain about Polynomial Representations.

25. How memory allocation is done in Two dimensional arrays?

26. Mention the steps involved on converting the Infix notation to postfix notation.

27. Compare and contrast stacks with queues.

28. How to traverse the given linked list? Explain.

29. Compare between Arrays and linked list.

30. How to convert forest into binary tree? Explain with an example.

31. Describe Dijikistra's algorithm for finding the shortest path.

32. Explain the arrays with examples.

33. Give a brief a note on the operations of stack.

34. Explain the applications of queue.

35. Discuss the addition of two polynomials.

36. Summarize tree traversals.

37. Devise an algorithm for evaluating arithmetic expressions? Give example.

38. How binary trees are represented? Explain

39. What are the methods for representing graphs? Explain

Department Name: Computer Science   **Subject Code** : CS204S

Subject Name   :   Fundamentals of Data Structures   **Staff Name** : Mrs.M.A.Maria Parimala

PART-A

1.Define Data Structure.What are primitive and composite data types ?

2.Write about operations in an array?

3.Convert an infix expression $(A + B) * C - (D - E) * (F + G)$ into postfix expression.

4.Write a procedure for adding and deleting an element in a queue.

5.What are Linked List.Give the representations of Singly Linked List.

6. Define Trees, Binary Trees, siblings, ancestors and degree of a tree.

7. Describe the conversion of forest to binary tree.

8. Define the following:
   i) Graph ii) adjacent vertices iii) directed graph
   iv) undirected graph v) weighted graph

PART-B

9. How polynomials can be represented using linked lists?

10. Explain the operations performed on stacks.

11. Summarize tree traversals.

12. What are the methods for representing graphs? Explain

13. Write an Algorithm for Shortest path Routing.

14. Write and explain an algorithm to ADD and DELETE a node to a doubly linked list.

15. What is a circular queue?How addition and deletion can be done in a circular queue?
    Explain