Pandit Deendayal Energy University

School of Technology

Department of Computer Science & Engineering

Odd Semester 2021-2022

PRACTISE SET 1 (DATA STRUCTURES)

INTRODUCTION, ARRAY, STACK, QUEUE, PERFORMANCE ANALYSIS

1. Explain how matrix can be stored using arrays?
2. Distinguish between time and space complexity?
3. Discuss the performance analysis and evaluation methods of algorithm?
4. Define and explain Big O notation?
5. Define complexity of an algorithm. What is meant by time-space trade off?
6. What is an Algorithm? Explain with example the time and space analysis of an algorithm.
7. Distinguish between primitive and non-primitive data structures.
8. Differentiate linear and non-linear data structures.
9. Explain the advantages and disadvantage of list structure over array structure.
10. What do you understand by best, worst and average case analysis of an algorithm?
11. How will you specify the time complexity of an algorithm?
12. Define and explain the data structure stacks.
13. What are the operations on stack and an important use for this structure?
14. Explain how infix expressions are converted to polish notation. Illustrate the answer with suitable example?
15. Discuss the use of a stack in implementing recursive procedures.
16. Explain recursion with one example.
17. Write an algorithm for deleting an element from a stack.
18. Discuss the application of stacks.
19. What is a Stack? Explain any two operations performed on a Stack with required algorithms.
20. What is recursion? Give the application of recursion with programs.
21. Explain the application of stack for conversion of infix to postfix.
22. Write procedure to convert infix to postfix expressions.
23. Explain how a postfix expression is evaluated using stack with suitable example?
24. Write an algorithm to add a new element of information to a circular queue?
25. Write algorithms for inserting and deleting items from a DEQUE?
26. Explain the implementation of circular queue using array. How an “empty queue” is distinguished from a “full queue”? Write necessary functions to perform all valid operations on circular queue.
27. What are dequeues? Explain various representations of dequeues.
28. Mention and explain various types of queues. Compare them.