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Question Bank- 1 : Data Structures (3130702)

1. What is mean by data structure? What are the different types of data structures?
2. What is mean by Algorithms and its complexity? Explain types of complexities.
3. Explain the row-major and column-major representation of two-dimensional arrays.
4. Given the base address of an array **A[1300……1900]** as **1020** and the size of each element is **2 bytes** in the memory, find the address of **A[1700]**?
5. A two dimensional array defined as **A[2:5,-3:1]** requires **3 bytes** of storage space for each elements. If the array is store in row-major form, then calculate the address of element at location **A[4,0]**, Given that the base address (L0) is **1082**.
6. What is mean by stack? Write an algorithm for PUSH, POP and CHANGE operation.
7. What is the data structure used to perform recursion? Explain the types of recursions.
8. Write prefix and postfix expression for given infix expression (A-B/C) * (D*E-F) with stack tracing for postfix evaluation.
9. Write is mean by Queue? Write an algorithm for INSERT and DELETE foe circular queue.
10. What is mean by Double Ended Queue? Explain types of Double Ended Queue and write down step by step procedure to perform insert and delete operations on double ended queue.
11. Write a program to evaluate the postfix expression?
12. Convert following infix expression in postfix and prefix
    1. A * B + C / D
    2. (A + B) + (C / D) - (D + E)
    3. P * Q – X ^ Y
    4. R / S + A ^ B ^ C
13. Evaluate the given postfix expression.
    1. 5 3 + 6 2 / * 3 5 * +
    2. 6 2 3 + - 3 8 2 / + * 2 ^ 3
    3. 7 6 + 4 * 4 10 + - 5 +
    4. 12 , 6 , 3, / , 2 , * , /
14. What is the difference between static memory allocation and dynamic memory allocation?
15. Write C/C++ code for allocating the memory dynamically for singly and doubly linked list with proper declaration of all variables.
16. Write a program to implement operations of stack using singly linked list.
17. Write a program to implement operations of queue using singly linked list.
18. What are the advantages and disadvantages of Singly Linked List, Circular Linked List and Doubly Linked List?
19. Write C/C++ code for Delete operation performed on Singly Linked List.
20. Write a algorithm to count a total no. of nodes in singly linked list.
21. Write a Pseudo-code to find the average of all the elements in singly linked list
22. Explain and describe the step to reverse the singly linked list