

CE

GANPAT UNIVERSITY
B. TECH SEMESTER - IV (CE/IT) EXAMINATION
REGULAR EXAMINATION MAY/JUNE-2012
2(CE/IT) 403: DATA STRUCTURE

Seat No. _____

Time: 3 Hours]

[Total Marks: 70

- Instructions:
1. Attempt all questions.
 2. Figures to the right indicate full marks
 3. Each section should be written in a separate answer book

Section-I

- Q-1. **Answer the following**
- (A) Differentiate Linear data structure and Non-linear data structure. [3]
Give the example of Linear and Non-linear data structure.
- (B) What is Base Address? Assume we have two array, one array is integer array and second is char array, if we want to calculate address of a[34] element then by which way it will be differ in both cases? [3]
- (C) Write a C program to find all the even number and odd number from a given array of size of 15. Store all the even number in one array and store all the odd number in second array, if number is repeated ignore it. [6]

OR

- Q-1. **Answer the following**
- (A) Define term Data structure. What is the major advantage of Data structuring? What are the types of data structure? [3]
- (B) What is pointer? Explain with the help of example. [3]
- (C) Apply Bubble Sort on following given data [6]
88 , 43 , 55 , 13 , 98 , 23 , 76 , 65

- Q-2. **Answer the following**
- (A) What is stack? Give some real time example of stack. [6]
(HINT: stack as a pile of plates requiring washing in a restaurant kitchen)
Write a C program (or Algorithm) to implement stack as well as it also gives status of stack whenever we call function status() to display how many slots are still free.
- (B) Write a C program (or Algorithm) to convert any infix expression into postfix. [5]

OR

- Q-2. **Answer the following**
- (A) What is the disadvantage of Single Queue? [6]
Write a C program (or Algorithm) to implement Single Queue.
- (B) What is the advantage of Circular Queue? [5]
Write a C program (or Algorithm) to implement Circular Queue.

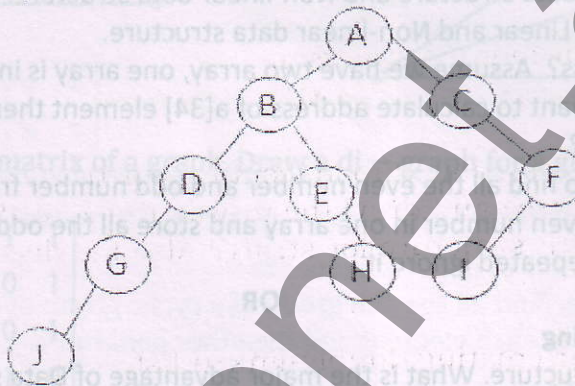
- Q-3. **Answer the following**
- (A) Convert the following infix expression into postfix (Note: With the help of Stack) [8]
1) $A * B / C * D + E / F$
2) $A + B / C * D + E * F$
- (B) Convert following Postfix into Infix [4]
1) $AB + D * EF - *$

Section II

- Q-4. Answer the following [6]
- (A) What are the advantages of linked list over array ?
Explain **malloc** function with the help of example. [6]
 - (B) Create a single linked list of 6 elements and also write the code to find frequency of a number in list. Display all the nodes and if searched element is existing in list then prints its frequency. (Hint: suppose we have list 1 2 3 4 4 5 if we search 4 then it will print 4 is appearing 2 times) [6]

OR

- Q-4. Answer the following [6]
- (A) Traverse following Binary Tree in inorder, preorder and postorder. [6]



- (B) Differentiate Full Binary Tree and Complete Binary Tree with the help of example. [6]
- Q-5. Answer the following [6]
- (A) Write a C program to implement doubly linked list, also manage head and tail. Also write the code to insert at beginning (Note: create 5 node as initial) [6]
 - (B) Initially queue is empty after that following operations is performed, after operations what will be the front and rear positions show with the help of diagram? [5]
(1)enqueue (2)enqueue (3)enqueue (4)dequeue (5)dequeue
(Initially front and rear is -1.)

OR

- Q-5. Answer the following [6]
- (A) Generate binary search tree for following given data [6]
56, 34, 67, 89, 26, 27, 19, 38, 10
 - (B) Evaluate expression: $12 \ 7 \ 3 \ - \ / \ 2 \ 1 \ 5 \ + \ * \ +$ [3]
 - (C) Differentiate tree and binary tree [2]

- Q-6. Answer the following [3]
- (A) Write a C program to implement a circular linked list. (Create 5 nodes) [3]
 - (B) Initially stack is empty after that following operations is performed after operations show the tos (top of the stack) show with the help of diagram. [3]
(1) push (2) pop (3) push (4) push (5) pop
(Initially tos is -1)
 - (C) Write a C program to traverse a Linked list, if node data is divisible by 7 then push that number into stack. (Assume stack size is 5 and no of node in linked list is 5.) [6]