GANPAT UNIVERSITY

B. TECH SEM- IV (CE/IT) CBCS REGULAR EXAMINATION– APRIL-JUNE 2016

2CE404/2IT404:Data Structures

TIME: 3 HRS]   [TOTAL MARKS :60

Instructions: (1) This Question paper has two sections. Attempt each section in separate answer book.
(2) Figures on right indicate marks.
(3) Be precise and to the point in answering the descriptive questions.

SECTION: I

Q-1 [A] Write an algorithm to perform delete any operation on singly linked list. [6]

[B] Write an algorithm to find the address of node with highest (numeric) node value [4]
from circular linked list.

OR

Q-1 [A] Define Linked list data structure. Explain implementation of linked list data [6]
structure using C programming language.

[B] Write an algorithm to implement Breadth First Search(BFS). [4]

Q-2 [A] Define Queue data structure. Explain different types of queue in brief. [6]

[B] Write C programming module to perform circular queue traversal. [4]

OR

Q-2 [A] Write C programming module that compare two strings are equal or not using [6]
pointers.

[B] Discuss input – output restricted dequeues. [4]

Q-3 [A] Define: Graph. Discuss following Graph terminologies with example [6]
1. Mixed graph
2. Multi graph
3. Simple graph
4. Elementary path
5. Parallel edges.

[B] Write C programming module to perform concatenation between two doubly [4]
linked lists.

[P. T.O]

Q-4. **[A]** Explain the terms infix expression, prefix expression and postfix expression. **[5]**
Convert following infix expressions into postfix and prefix expression.
- ((A*B)+C/((D-E)+F))
- $1 / 7 * 3 - 4 + 9 / 2 \char`^ 6$

[B] Explain Tower of Hanoi problem with example. **[5]**

OR

Q-4. **[A]** Convert the expression given below into its corresponding postfix expression and **[5]**
then evaluate it. Also write C program to evaluate a postfix expression.
$10 + 7 - 3 * 6 / 3 + 5$

[B] **[5]**
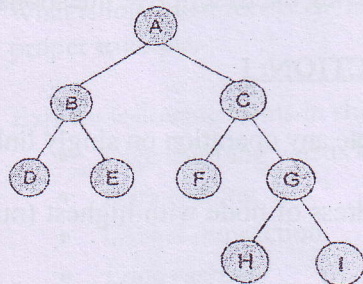
Attempt followings:
- Make a list of the leaf nodes & non leaf nodes.
- Name the ancestors of node E
- Name the descendants of A.
- Name the siblings of C.
- Find out the in-order, pre-order and post-order.
- Find the height of the tree.

Q-5. **[A]** Sort the elements 77,49,25,12,9,33,56,81 using following sorting algorithm: **[5]**
a) Selection sort   b) Shell sort

[B] Write C program to implement partition-exchange sort. **[5]**

OR

Q-5. **[A]** Write C program to implements bubble sort. Given the numbers 17, 14, **[6]**
12,57,30,45, How many swaps will be performed to sort these numbers using the
bubble sort?

[B] What is searching? Which technique of searching an element in an array would you **[4]**
prefer to use and in which situation?

Q-6. **[A]** Create a binary search tree with the input given below: **[6]**
98,2,48,12,56,32,4,67,23,87,55,46 (Consider 98 is root node)
Also delete values 23,56,2 and 46 from the tree.

[B] Explain any four algorithm terminologies in detail. **[4]**

-----End of Paper-----