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SECOND SEMESTER **B.E. (COE)**

MID-SEMESTER THEORY EXAMINATION MARCH, 2017
CEC02 DATA STRUCTURES

Time: 90 Mins. **MM: 15**

Note: Assume suitable missing data, if any.

Q1. Briefly explain the following:

i. A single array A[1..MAXSIZE] is used to implement two stacks. The two stacks grow from opposite ends of the array. Variables top1 and top2 (topl< top 2) point to the location of the topmost element in each of the stacks. If the space is to be used efficiently, specify the condition for "stack full" and find the number of elements at any moment in the stacks. (1)

ii. Write a function to insert and delete an element *item* in the queue of priority *p.* (2)

iii. Derive an expression for finding the address of an item $A(i_1,i_2,i_3, \ldots, i_n)$ for the array $A(l_1:u_1,l_2:u_2, \ldots,l_n:u_n)$ given that the address of the first element is α. The elements are stored in the column major order. (2)

Q2. i. Write an iterative algorithm/subroutine to check if a singly linked list is palindrome or not? (2)

ii. Write the function to delete a node from a binary search tree? (3)

Q3. i. Write an iterative algorithm/subroutine for post-order traversal of a binary tree. (3)

ii. A binary search tree contains the numbers 1, 2, 3, 4, 5, 6, 7, 8. When the tree is traversed in pre-order and the values in each node printed out, the sequence of values obtained is 5, 3, 1, 2, 4, 6, 8, 7. Find the sequence when the tree is traversed in post-order? (2)

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THIRD SEMESTER B.E. (IT)

B.E. MID SEM. EXAMINATION, SEPT-2015

IT 201 DATA STRUCTURES

Time: 1:30 Hrs. Max. Marks: 20

Note: Assume suitable missing data, if any.

1. Write a program to implement a Stack using two Queues. (5)
2. Write an algorithm to sort a doubly linked list using Quicksort. (5)
3. Write an algorithm to convert an infix expression into a postfix expression. (5)
4. Write an algorithm to find middle element of a linked list in one pass. (5)

OR

Write an algorithm to detect loops in a linked list.

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B.E. MID SEMESTER EXAMINATION SEPTEMBER,2014 BE(IT)

IT-201: DATA STRUCTURES

Time:1.30 Hours

Max.Marks:20

Note: Assume suitable missing data,if any.

Q.1 Why does storing of sparse matrices need extra consideration?How are sparse matrices stored efficiently in the computer's memory? **2**

Q.2 Consider the following multidimensional arrays:

X(-5:5,3:33) Y(3:10.1:15,10:20)

a) Find the length of each dimension and the number of elements in X and Y.

b) Suppose Base(Y)=400 and there are w=4 words per memory location.Find the effective indices E1,E2,E3 and the address of Y[5,10,15] assuming Y is stored in row-major order. **3**

Q.3 a)Compare the Linear Linked List and Doubly Linked List according to their advantages and disadvantages. **1.5**

b)What is a free storage list and how it is maintained ? Specify the use of a header node in a header linked list. **1.5**

Q.4 Write an algorithm to create a list in memory by name Student .Insert the names of five students in the list Student and copy the contents of existing list into Student1. **3**

Q.5 Explain the terms infix expression,prefix expression, and postfix expression.Convert the following infix expressions to their postfix equivalents:

a) (A-2*(B+C)/D*E)+F

b) 14/7*3-4+9/2 **3**

Q.6 Consider the following array :

68,2,4,88,24,16,11,48,10,9

Show the contents of the array after sorting listed below:

Quick Sort: After 3rd iteration. **3**

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THIRD SEMESTER B.E. (IT)

B.E. MID SEM. EXAMINATION, SEP.-2013

IT-201, Data Structure

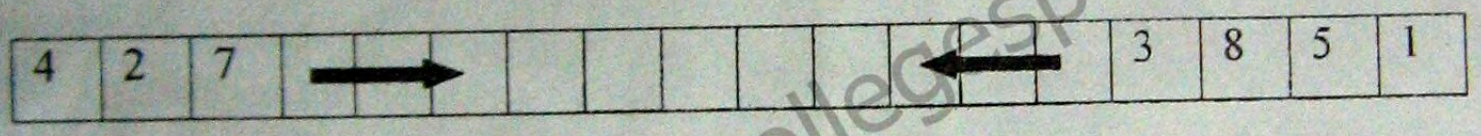
Time: 1.5 Hrs. Max. Marks: 20

Note: All questions are compulsory
Assume suitable missing data, if any.

1. Write a program to read name, age and salary of 10 persons and maintain them in a linked list sorted by name. (4)

2. Write a program to represent an input restricted queue using linked list. Also, write functions to add and delete elements from deque. (5)

3. Write a program to implement two stacks S1 and S2 using an array of size n. The stacks grow in opposite directions as shown in figure below: (4)



4. Construct a binary tree whose following traversals are given:
Inorder: D F E I H B A J C N O M K
Postorder: F I H E D B J O N M K C A (2)

5. What do you mean by an AVL tree? Construct an AVL tree by inserting the following element in the order of their occurrence:
H, I, J, B, A, E, C, F, D, G, K, L (5)

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B.E.(IT) IIIrd Sem
Mid Sem Examination, Sept'2010
IT-201: Data Structures

Time: 1 ½ hrs Max.Marks 20

Note: All Questions are compulsory.
Assume suitable missing data, if any.

1. Suppose an unsorted linked-list is in memory. Write a procedure
SEARCH(INFO, LINK, START, ITEM, LOC) (4)
Which
i) Find the location LOC of ITEM in the list or sets LOC:=NULL for an unsuccessful search and
ii) When the search is successful, interchange ITEM with the element in front of it.

2. Consider the following postfix expression: (4)
6, 10, +, 12, 8, -, *, 8, 2, -4, -, +
Translate expression into infix notation and evaluate.

3. Define an algorithm for a output restricted deque. Implement the designed algorithm. (4)

4. Given the inorder and preorder, display the tree formed. Also, give the post order traversal (3)
Preorder: 40, 10, 5, 2, 8, 15, 23, 20, 50, 45, 55, 52.
Inorder: 2, 5, 8, 10, 15, 20, 23, 40, 45, 50, 52, 55

5. Discuss the Towers of Hanoi problem.Give algorithm using recursion. Illustrate with the help of an example. (5)