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M. Sc
MSIT 1202

2nd Semester Examination (2012 Syllabus): April-May 2015

DATA STRUCTURE USING 'C'

Full Marks: 60

Time: 3 Hrs.

Answer Question No.1 which is compulsory and any Five from the rest.

The figure in the right hand margin indicates marks.

PART – A

[10x1.5=15]

1. a) What is the difference between array and linked list representations?
- b) Write the conditions to check “the queue is full” and “the queue is empty”.
- c) Write the difference between doubly and circularly linked lists.
- d) What type of structure is used to define a node in linked list? Give an example.
- e) Define a complete graph? Give an example.
- f) Define a Height Balanced Tree. Give an example.
- g) Define a queue. What are the applications of queue?
- h) What is the best case and worst case complexity of Quick Sort?
- i) Define a complete graph. What is the total number of edges in a complete graph with n nodes?
- j) Define an ADT. Give an example.

PART – B

[5x9=45]

2. a) Write a C program functions to implement Push and Pop operations of a Stack using array.
- b) Convert the given infix expression $((A+B)*C-(D-E)) \wedge (F+G)$ into equivalent postfix expression using Stack. [4]
3. a) Write algorithms or C functions to insert a node in the beginning and end of a single linked list. [5]
- b) Write an algorithm or C function to delete an element from a linear Queue. [4]
4. a) What are expression trees? Represent the following expression using an expression tree: $(a-b) / ((c*d) + e)$
Comment on the result that you get when this tree is traversed in Preorder, In-order and post order. [5]
- b) Construct the binary tree for the following sequence of nodes in preorder and in-order respectively. [4]
Preorder: G, B, Q, A, C, K, F, P, D, E, R, H
Inorder: Q, B, K, C, F, A, G, P, E, D, H, R