Total No of Questions: [8] *SEAT NO. :*

[Total No. of Pages : 3]

S.E. 2012 (Data Structures and Files)

(Semester - II)

Time: 2Hours ***Max. Marks : 50***

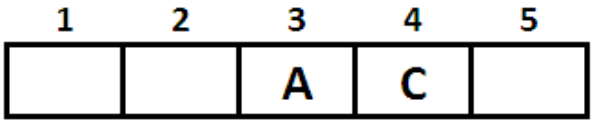
Instructions to the candidates:

1) ***Answer four questions***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary***

Q 1) **a)** Explain the concept of implicit and explicit stack. **[02]**

b) Write an algorithm to convert infix to postfix expression. **[04]**

c) Consider following circular queue of characters and size 5. **[06]**



Front point to A and Rear Points to C

Show the queue contents as per the following operations at every step.

i) F is added to the queue.
ii) Two letters are deleted.
iii) K, L, M are added to the queue.
iv) Two letters are deleted.
v) R is added to the queue.
vi) Two letters are deleted.
vii) R is added to the queue.
viii) Two letters are deleted.

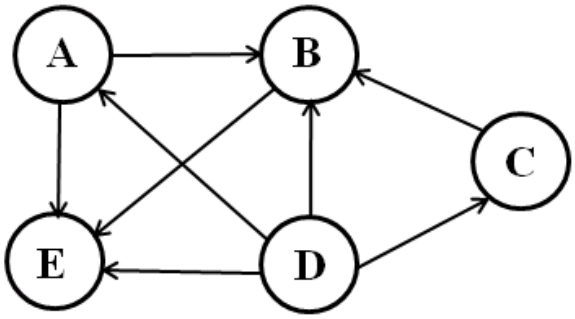
OR

Q 2) **a)** Implement Queue as an ADT using array representation. **[06]**

b) Clearly indicate the contents of stack during conversion of given infix expression to prefix expression. Consider ^ as exponent operator. **[06]**

(((A+B)*C-(D-E))^(F+G))

Q 3) **a)** For Given graph draw the adjacency list / matrix and perform BFS or DFS **[06]**

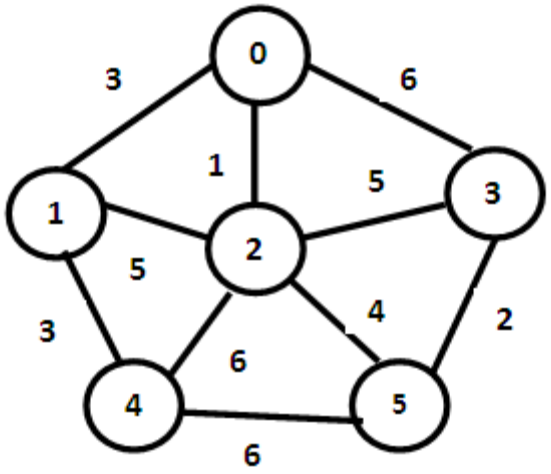


b) With Example define following terms **[06]**

i) Complete Binary tree
ii) Strictly Binary tree
iii) Predecessor and successor

OR

Q 4) **a)** Write a pseudo code for Prim's algorithm and find the MST for the graph given and show all the steps. **[08]**



b) For the binary tree representation as an array, perform in-order threading for the tree. **[04]**

A B C D E G H -- -- F -- -- -- J K -- -- -- -- -- -- -- -- -- -- -- -- -- L -- --

Q 5) **a)** Construct an AVL search tree by inserting the following elements in the order of their occurrence. Show the balance factor and type of rotation at each stage: **[10]**

MAR MAY NOV AUG APR JAN DEC JUL FEB JUN

b) Explain Huffman algorithm with an example. **[04]**

OR

Q 6) **a)** Sort the following numbers in ascending order using heap sort: **[10]**

55 33 11 77 44 22 66 88 99

b) Write a note on OBST. **[04]**

Q 7) **a)** With the prototype and example, explain following functions: **[04]**

i) seekg() ii)tellp()

b) Write C++ implementation of all primitive operations on Sequential file. **[08]**

OR

Q 8) **a)** What is a File? List different file opening modes? List the different types of external storage devices? **[06]**

b) Compare Sequential, Index sequential and direct access files. **[06]**