SUMMER-2014

UNIT 1

Q.1 a) Write the slow pattern matching algorithm and apply it to calculate the number of comparisons C to find the index of P = (abc) in the text string T = $(aaabce)^4$. **(7)**

b) Explain the different asymptotic notations. **(6)**

Q.2 a) Yet S be a character array variable such that S = 'VERY VERY FAST'. Find:

i. INDEX (S, 'VERY')

ii. INDEX (S, '□VE')

iii. SUBSTRING (S, 1, 4)

iv. SUBSTRING (S, 4, 7)

v. LENGTH (S)

vi. DELETE (S, 1, 4). **(6)**

b) Consider an array A: 7 5 8 10 15. Write an algorithm to find sum of even numbers in A. **(7)**

UNIT 2

Q.3 a) Give the representation of a linear array. Write an algorithm DELETE (LA, N, K, ITEM) which deletes the K^{th} element from the linear array LA having N elements. **(8)**

b) Give the different representations for a two dimensional array. **(6)**

Q.4 a) What are the different searching algorithms? Consider an array A: 10 15 5 3 20 1. Name and write the algorithm to search an element in A. **(8)**

b) Consider the string S = 'COUNTRY'. Apply bubble sort to arrange the characters in S in alphabetic order. Show all the passes. **(6)**

UNIT 3

Q.5 a) Let LIST be a linked list containing integer numbers. Write an algorithm to find the sum of all odd and even integers on the linked list. **(7)**

b) Write an algorithm INSLOC (INFO, LINK, START, AVAIL, LOC, ITEM) to insert so that ITEM follows the node with location LOC or ITEM as the first node when LOC = NULL. **(6)**

Q.6 a) Define the following terms:

i. Header list, **ii.** Two-way header list. **(6)**

b) Write an algorithm to reverse a linked list. **(7)**

UNIT 4

Q.7 a) Write an algorithm to convert an infix expression to a postfix expression. Apply the algorithm to convert the infix expression a*b+c-z/y to post-fix notation. **(8)**

b) Suppose a stack S is allocated N = 6 memory cells and initially S is empty. Find the output of the following:

i. Set A = 5, B = 6,

ii. Call PUSH (S, A),

iii. Call PUSH (S, 4),

iv. Call PUSH (S, B),

v. Call PUSH (S, 'A+B'),

vi. Repeat while Top ≠ 0 CALL POP (S, ITEM) WRITE: ITEM [End of loop],

vii. Return. **(6)**

Q.8 a) What is a priority queue? Give its linked list and array representation. **(8)**

b) What is stack? Write procedure for pushing an element onto a linked stack. **(6)**

UNIT 5

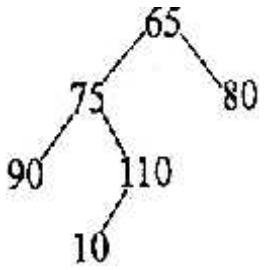
Q.9 a) Write an algorithm for inorder traversal of a binary tree. **(6)**

b) The inorder traversal of a binary search tree gives a sorted listing of the elements. Justify with an example. **(7)**

Q.10 a) Explain the following with an example:

i. Complete binary tree, **ii.** Heap. **(6)**

b) Consider the following binary tree:



Give the array representation of the above tree. **(7)**

UNIT 6

Q.11 a) Explain with an example the linked list representation of a graph. **(7)**

b) Write an algorithm for depth first search of a graph. **(6)**

Q.12 a) Name the search technique in which the search time is independent of the number of elements in the set. Explain the different problems for this technique. **(7)**

b) Apply selection sort to the following array A: 77, 80 90 10 5 15. **(6)**