SUMMER-2015

UNIT 1

Q.1 a) Write an algorithm for Linear Search and obtain an expression for its time complexity. **(7)**

b) Explain the following string operations:

i. SUBSTRING, **ii.** INDEX, **iii.** //. **(6)**

Q.2 a) Name the different storage structures for string and explain any one of them. **(7)**

b) Write an algorithm for slow pattern matching. **(6)**

UNIT 2

Q.3 a) Considering a linear array A write algorithm for:

i. Traversing A, **ii.** Inserting into A. **(6)**

b) Write an algorithm for binary search and obtain an expression for its time complexity. **(8)**

Q.4 a) Give the following representations for a two dimensional array:

i. Row major order, **ii.** Column major. **(6)**

b) Write an algorithm for bubble sort and obtain an expression for its time complexity. **(8)**

UNIT 3

Q.5 a) Write procedure for:

i. Printing information at each node on a linked list.

ii. Counting the number of nodes on a linked list. **(6)**

b) Write an algorithm for reversing a linked list. **(7)**

Q.6 a) Write procedure for:

i. Finding the maximum of the values on a linked list.

ii. Finding the average of the values on a linked list. **(6)**

b) Write algorithm INSLOC (INFO, LINK, START, AVAIL, LOC. ITEM) to insert ITEM so that ITEM follows the node with location LOC or inserts ITEM as the first node when LOC = NULL. **(7)**

UNIT 4

Q.7 a) What is stack? Assuming the array representation give procedure to:

i. Push, **ii.** Pop. **(6)**

b) What is priority queue? Explain the different representation of it. **(8)**

Q.8 a) Assuming the linked representation of queue, give procedure for:

i. LINKQ-INSERT (), **ii.** LINKQ-DELETE (). **(6)**

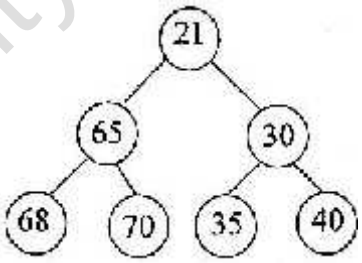
b) What is a recursive procedure? Explain. Write a recursive procedure to find factorial of a number.

FACTORIAL (FACT,N)

Trace the procedure to find 5! Show all the steps. **(8)**

UNIT 5

Q.9 a) Consider the following binary tree:



Which representation will be efficient to store the above tree? Give the representation and justify your answer. **(8)**

b) Explain:

i. HEAP, **ii.** Binary search tree. **(5)**

Q.10 a) Assuming the linked representation of binary tree write an algorithm for in order traversal of tree. **(8)**

b) Explain:

i. 2 Tree, **ii.** Inorder Threading. **(5)**

UNIT 6

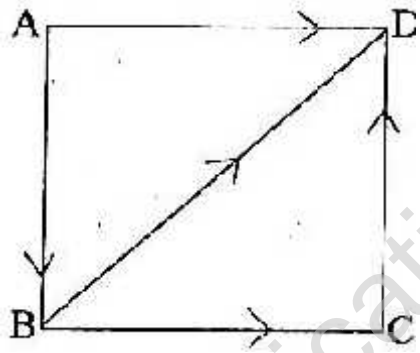
Q.11 a) Name the search technique in which the search time is independent of the number of elements in the set. Explain the technique in detail. **(8)**

b) Assume the an array A contains the following numbers:

A: 10 20 5 3 1

Apply insertion sort to sort A. **(5)**

Q.12 a) Consider the following graph:



Give the linked representation of above graph. **(7)**

b) Write an algorithm for Selection Sort. **(6)**