2021

BCA

[HONOURS]

(CBCS)

(B.Sc. Third Semester End Examination-2021)

PAPER-C5T

Full Marks: 40 ***Time: 02 Hrs***

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

Group-A

1. Answer any five questions of the following: 5x2= 10

a. Give one example of linear data structure and one example of non-linear data structure.

b. Suppose an array A[ ] has fifteen elements. Each element takes 3 bytes of memory space. If every memory location contain 8-bits of data and base address of A[ ] is $F000_H$, then find address of A[6].

c. Give postfix expression of the arithmetic expression: $(a+c)*(b-d)$.

d. Suppose, a stack initially contain a single element 7. Then following operations are performed in sequence:

PUSH(9), POP( ), POP( ), PUSH(5), PUSH(4), POP( ).

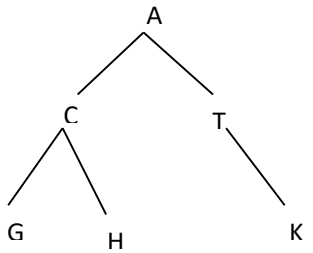
What is the present top of stack element?

e. Suppose, a queue is initially empty. Following operations are performed on this queue in sequence:

INSERT(8), INSERT(6), DELETE( ), INSERT(2), DELETE( ).

What is the front element of this queue now?

f. Consider the following binary tree:



Find pre-order traversal of this tree nodes .

g. Linear search is applied on an array of 60 elements. How many comparisons will be made when an item is searched which is not present in this array?

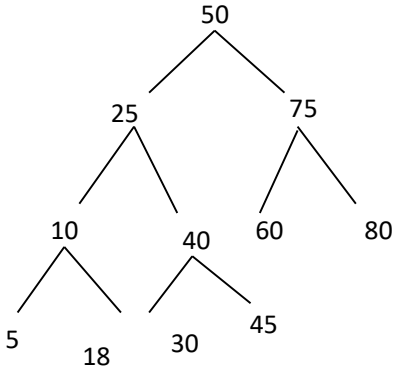
h. What is the pre-condition to search for an element using binary search?

Group-B

Answer any four questions of the following: 5x4 = 20

2. Write a recursive algorithm of binary search.
3. Write an algorithm to add two polynomials, where polynomials are represented using array

4. Suppose, bubble sort algorithm is run on following input elements: 5,15,2, 20, 6, 10. Show how bubble sort will arrange those input elements in ascending order. Calculate the number of swapping performed during this sort.
5. Write the insertion sort algorithm.
6. Consider the following binary search tree:



Write the post order traversal sequence of this nodes

7. Write the advantages and disadvantages of array data structure. 3+2

Group –C

Answer any one questions of the following: 10x1 = 10

8. a) Illustrate with diagram the solution of Tower of Hanoi problem with three disks.

b) Write algorithm of linear search.

c) when does underflow occur in stack? 3+4+3

9. a) Why do we use circular queue?

   b) How do we check if a queue is empty or full?

   c) What are the advantages and disadvantages of binary search tree? 3+4+3
