B.C.A. Part-I (Semester–I) (CBCS) Examination

DATA STRUCTURE

1BCA3

Time : Three Hours] [Maximum Marks : 80

Note :— (1) All questions are compulsory.
(2) Question no. 1 is compulsory.
(3) Assume suitable data wherever necessary.

1. (A) Choose the correct alternative from the following.

(1) In linked list insertion can be done at ____.

(a) Beginning (b) END
(c) Middle (d) All of the above

(2) Which of the following causes overflow in stack?

(a) TOP = O (b) MAXSTK = TOP
(c) TOP = MAXTOP (d) None of these

(3) Queue works on principle called as ____.

(a) FIFO (b) LIFO
(c) FILO (d) None of these

(4) Which of the following is not a linear data structure?

(a) Array (b) Stack
(c) Trees (d) Linked list

(5) Linear arrays are also called ____.

(a) Straight line array (b) Vertical array
(c) One dimensional array (d) Horizontal array

(6) When insert new element into linked list then INFO (NEW) = ____.

(a) AVAIL (b) START
(c) ITEM (d) NEW

(7) The elements are removed from a stack in ____ order.

(a) Reverse (b) Hierarchical
(c) Alternative (d) Sequential

(8) In general, the index of the first element in an array is ____.

(a) 0 (b) -1

(c) 2 (d) 1

(9) In a linked list the ____ field contains the address of next element in the list.

(a) Link field (b) Next element field

(c) Start field (d) INFO field

(10) Binary search algorithm cannot be applied to ___.

(a) Sorted linked list (b) Pointer array

(c) Sorted binary tree (d) Sorted linear array 1×10=10

(B) Fill in the blanks.

(1) The level of Root node is always ____.

(2) IF START = ____ then this indicates that the list is currently empty.

(3) Deletion of element from stack is called as ____.

(4) ____ can be used as a tool to solve Tower of Hanoi problem.

(5) ____ is a process of combining the record in two different sorted files into a single sorted file. 1×5=5

(C) Answer the following questions in one sentence each.

(1) What is Binary tree?

(2) What is double linked list?

(3) What do you mean by recursion?

(4) What is edge?

(5) What is traversing? 1×5=5

2. (A) State and explain various algorithmic notations used in data structrue. 6

(B) What is data structure? Explain various operations performed on data structure. 6

OR

3. (A) Explain the following terms : 6

(i) Time complexity

(ii) Space complexity

(B) Explain advantages & disadvantages of linear array data structure. 6

4. (A) Write an algorithm to convert an expression from infix to postfix. 6

(A + B) * C – (D – E) / (F + G)

(B) Explain representation of queue using array. 6

OR

5. (A) Explain types of queue with example. 6

(B) Explain the following terms with proper example : 6

(i) PUSH (ii) POP.

6. (A) What is a linked list? How linked list can be implemented using array ? Explain. 6

(B) Explain : 6

(i) Header linked list

(ii) Circular linked list.

OR

7. (A) Write an algorithm to insert a node at the beginning in linked list. 6

(B) Explain : 6

(i) Garbage collection

(ii) Doubly linked list.

8. (A) Explain traversing operation of Binary tree in detail. 6

(B) Explain array representation of Binary tree with example. 6

OR

9. (A) Explain Binary tree with example. Write representation using linked list. 6

(B) Explain : 6

(i) Leaf node

(ii) Root node

(iii) Sibling

(iv) Node

(v) Depth

(vi) Right subtree.

10. (A) Differentiate between Linear search & Binary search. 6

(B) Describe merge sort algorithm. 6

OR

11. (A) Write & explain Bubble Sort algorithm. 6

(B) Describe Quick Sort algorithm. 6