BCA (Sem-III) – Data Structure (301) (Core V)

2021

Time : 3 hours

Full Marks : 70

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

The figures in the margin indicate full marks.

*Answer **all** sections as directed.*

Section–A

(Compulsory)

1. Pick up the correct alternative for each of the following questions : 10×2=20

(a) Which data structure in defined as a collection of similar data element ?

(i) Arrays

(ii) Linked Lists

(iii) Trees

(iv) Graphs

(b) If Top=Max^{-1}, then that stack is :

(i) Empty

(ii) Full

(iii) Contains some data

(iv) None of these

(c) Consider the linked lists of an element. What is the time taken to insert an element after an element pointed by some pointer ?

(i) O

(ii) $O(\log_2 n)$

(iii) O(n)

(iv) $O(n\log_2 n)$

(d) An Binary Tree has a height of 5. What is the minimum number of noodes, it can have ?

(i) 31

(ii) 15

(iii) 5

(iv) 1

(e) Reverse Polish notation is the other name of :

(i) Infix Expression

(ii) Prefix Expression

(iii) Postfix Expression

(iv) Algebric Expression

(f) In a queue, insertion is done at :

(i) Rear

(ii) Front

(iii) Back

(iv) Top

(g) Pre-order traversal is also called :

(i) Depth first

(ii) Breadth first

(iii) Level order

(iv) In order

(h) In which sorting, consecutive adjacent pairs of elements in the array are compared with each other ?

(i) Bubble sort

(ii) Selection sort

(iii) Merge sort

(iv) Radix sort

(i) The complexity of binary search algorithm is :

(i) $O(n)$

(ii) $O(n)^2$

(iii) $O(n \log n)$

(iv) $O(\log n)$

(j) The process of examining memory locations in which table is called :

(i) Hashing

(ii) Collision

(iii) Probing

(iv) Addressing

Section–B

Answer any **four** questions : 4×5=20

2. How many ways can you categorize data structure ? Explain each of them.

3. Briefly explain the concept of pointers.

4. What is stack ? Define LIFO and FIFO system in stack with example.

5. Define queue. Difference between linear queue and circular queue.

6. Define linked list. Define array with example.

7. Write the program of library management using stack.

8. Discuss the advantages of an AVL tree.

Section–C

Answer any **two** questions of the following :

2×15=30

9. What is stack ? Explain all the operation of stack with array implementation.

10. Explain the term infix expression, prefix expression and postfix expression. Convert the following expression to their postfix equivalents :

(a) $((A-B)+D/(E+F)*G)$

(b) $(A*B)+(C/D)-(D+E)$

11. Difference between Singly and Doubly Linked List with example.

12. What is application of stack ? Explain.

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