BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – BCA-2018
Course Name – Data Structures
Course Code - BCA201
(Semester II)

Time : 3:0 Hours

Full Marks : 70
[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question)

1 x 15=15

1. *Choose the correct alternative from the following :*

(i) To obtain a prefix expression, which of the tree traversals is used?

a) Level-order traversal
b) Pre-order traversal
c) Post-order traversal
d) In-order traversal

(ii) In a full binary tree if number of internal nodes is I, then number of leaves L is?

a) L = 2*I
b) L = I + 1
c) L = I – 1
d) L = 2*I – 1

(iii) _____ is a directed tree in which out degree of each node is less than or equal to two.

a) Unary tree
b) Binary tree
c) Ternary tree
d) both binary tree & Ternary tree

(iv) _____ is not the component of data structure.

a) Operations
b) Storage Structures
c) Algorithms
d) None of these

(v) What is the worst case complexity of binary search using recursion?

a) O(n log n)
b) O(log n)
c) O
d) O(n2)

(vi) What is the space complexity of an array having n elements?

a) O
b) O (n log n)
c) O (log n)
d) O(1)

(vii) Finding the location of a given item in a collection of items is called

a) Discovering
b) Finding
c) Searching
d) Mining

(viii) Finding the location of the element with a given value is:

a) Traversal
b) Search
c) Sort
d) None of these

(ix) Which is the pointer associated with the stack?

a) FIRST
b) FRONT
c) TOP
d) REAR

(x) Deletion operation is done using _____ in a queue.

a) Front
b) Rear
c) Top
d) List

(xi) Before inserting into the stack one must check the condition _____

a) Overflow
b) Underflow
c) Maximum elements
d) Existing elements

(xii) Which of the following linked list below have the last node of the list pointing to the first node?

a) circular doubly linked list
b) circular linked list
c) circular singly linked list
d) doubly linked list

(xiii) If an array is declared as int arr[30] , how many elements can it hold?

a) 30
b) 31
c) 0
d) 1

(xiv) What is the space complexity of a linear queue having n elements?

a) O
b) O(nlogn)
c) O(logn)
d) O(1)

(xv) What is an external sorting algorithm?

a) Algorithm that uses tape or disk during the sort
b) Algorithm that uses main memory during the sort
c) Algorithm that involves swapping
d) Algorithm that are considered 'in place'

Group-B
(Short Answer Type Questions)

3 x 5=15

2. Write the advantages of threaded binary tree. (3)
3. What are some of the applications of data structure? (3)
4. List various uses of tree data structure (3)
5. Define tree? (3)
6. What is use of Big O notations? (3)

OR

What are the steps to convert a general tree into binary tree? (3)

Group-C
(Long Answer Type Questions)

5 x 8=40

7. Is the heap sort always better than the quick sort? (5)
8. Compare quick sort and merge sort. (5)
9. What is the output of quick sort after the 3rd iteration given the following sequence? 24 56 47 35 10 90 82 31 (5)
10. What is Binary search? (5)
11. What is the advantage of linked list over arrays? (5)
12. How many key comparisons and assignments an insertion sort makes in its worst case? (5)
13. Why sorting algorithm is easily adaptable to singly linked lists? (5)
14. What is visiting and traversing in graph? (5)

OR

What is open addressing? (5)