

BRAINWARE UNIVERSITY

Term End Examination 2023 Programme - BCA-2019/BCA-2020/BCA-2021 Course Name - Data Structures Course Code - BCAC201 (Semester II)

Full Marks: 60

Time: 2:30 Hours

[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

- Choose the correct alternative from the following:
- (i) Which of the following is a measure of the efficiency of an algorithm?
 - a) Space complexity

b) Time complexity

c) Input complexity

- d) Output complexity
- (ii) What is the time complexity of an algorithm with O(1) running time?
 - a) Constant time

b) Linear time

c) Quadratic time

- d) Exponential time
- (iii) If the elements "A", "B", "C" and "D" are placed in a queue and are deleted one at a time, in what order will they be removed?
 - a) ABCD

b) DCBA

c) DCAB

- d) ABDC
- (iv) Which of the following is a disadvantage of a time-space tradeoff?
 - a) Increased running time

- b) Increased memory usage
- c) Decreased accuracy of the algorithm
- d) Increased complexity of the algorithm
- (v) Identify the operations NOT typically supported by a stack?
 - a) Push

b) Pop

c) Enqueue

- d) Peek
- (vi) Select Which of the following linked lists 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
- (vii) Show the operation to remove an element from the top of a Stack in
 - a) stack.remove()

b) stack.delete()

West Bengal 700 126 c) stack.pop() (viii) When a top-down approach of dynamic programming is applied to a problem, it usually b) Decreases the time complexity and increases a) Decreases both, the time complexity and the space complexity the space complexity c) Increases the time complexity and decreases d) Increases both, the time complexity and the the space complexity space complexity (ix) A linear list of elements in which deletion can be done from one end (front) and insertion can take place only at the other end (rear) is known as a a) Queue b) Stack c) Tree d) Linked list (x) For each node a doubly linked list has a) 0 pointers b) 1 pointers c) 2 pointers d) 3 pointers (xi) Which of the following is the main advantage of a priority queue over a regular queue? a) Faster insertion b) Faster deletion d) Elements are processed based on their c) Elements are processed in the order they are added priority (xii) Which of the following is not the type of queue? a) Priority queue b) Single ended Linked list c) Circular queue d) Ordinary Queue (xiii) Predict how can be improved the efficiency of Quick sort by adopting a) non-recursive method b) insertion method c) tree search method d) None of these (xiv) Select Which data structure is needed to convert infix notation to postfix notation? a) Branch b) Tree c) Queue d) Stack (xv) Identify the definition of physical size in a dynamic array b) The size extended to add new elements a) The size allocated to elements c) The size of the underlying array at the backd) The size visible to users end Group-B (Short Answer Type Questions) 3 x 5=15 List the types of Data Structures. (3)3. Describe the advantages of Linked Lists over arrays (3)4. Explain the tree traversals with algorithms and examples. (3)5. Solve the following postfix expression: 100 200 + 2 / 5 * 7 + (3)6. Distinguish between Stack Overflow and Stack Underflow? (3)OR Justify the different operations of Stack. (3)Group-C (Long Answer Type Questions) 5 x 6=30 7. Compare between Time complexity and Space complexity. (5)8. Discuss the characteristics of an algorithm. (5)9. What is Big O Notation, and why does it matter (5)

d) stack.shift()

hnaou Road

10. Explain binary tree.

11. Summarize the concept of different array data structure.

12. Compare between binary search and linear search.

OR

Compare between binary search and interpolation search.

Romkinshnapur Ro. (5)

(5)

(5)