



BRAINWARE UNIVERSITY

Term End Examination 2018 - 19

Programme – Bachelor of Science (Honours) in Computer Science

Course Name –Data Structure and Algorithm

Course Code - BCSC202(BL) /BCS202(BL)/BCS202(OLD)

(Semester – 2)

Time allotted:3 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)

10 x 1 = 10

1. *Choose the correct alternative from the following*
- (i) The number of interchanges required to sort 5, 1, 6, 2 4 in ascending order using Bubble Sort is
 - a. 6
 - b. 5
 - c. 7
 - d. 8
- (ii) 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
- (iii) The highest element of an array's index is called its
 - a. lower bound.
 - b. upper bound.
 - c. range.
 - d. extraction.
- (iv) What do the leaves of an expression tree represent?
 - a. Operand
 - b. Operator
 - c. Operation
 - d. All of these
- (v) The data structure required to evaluate a postfix expression is
 - a. queue
 - b. stack
 - c. array
 - d. linked-list
- (vi) The complexity of searching an element from a set of n elements using Binary search algorithm is
 - a. $O(n)$
 - b. $O(\log n)$
 - c. $O(n^2)$
 - d. $O(n \log n)$

- (vii) The postfix form of $A*B+C/D$ is
- | | |
|--------------|--------------|
| a. $*AB/CD+$ | b. $AB*CD/+$ |
| c. $A*BC+/D$ | d. $ABCD+/*$ |
- (viii) Traversal of a linked list always starts from the _____.
- | | |
|---------------|------------------|
| a. First Node | b. Middle Node |
| c. Last Node | d. None of these |
- (ix) The operation of processing each element in the list is known as, _____.
- | | |
|--------------|--------------|
| a. Sorting | b. Merging |
| c. Inserting | d. Traversal |
- (x) Which of the following is the fastest ways to store and retrieve data?
- | | |
|-------------|-----------------|
| a. Sorting | b. Hashing |
| c. Indexing | d. Both A and C |

Group – B

(Short Answer Type Questions)

3 x 5 = 15

Answer any *three* from the following

- | | |
|--|---|
| 2. Convert the following infix expressions into its equivalent prefix expressions-
$A*(B+D)/E - F*(G +H K)$ | 5 |
| 3. What is selection sort? Sort the following array using selection sort method.
24 56 47 35 10 90 82 31 | 5 |
| 4. Describe bubble sort with a proper algorithm. | 5 |
| 5. What is quick sort? Sort the following array using quick sort method.
24 56 47 35 10 90 82 31 | 5 |
| 6. Describe insertion sort with a proper algorithm. | 5 |

Group – C

(Long Answer Type Questions)

3 x 15 = 45

Answer any *three* from the following

- | | |
|--|---|
| 7. (a) Show the various passes of bubble sort on an unsorted list
11, 15, 2, 13, 6 | 8 |
| (b) Describe the concept of binary search technique? Is it efficient than sequential search? | 7 |

8. (a) Write down any four application of a stack. 2
(b) Write down PUSH and POP algorithm of stack. 8
(c) Write down the algorithm of linear search. 5
9. (a) Write down any two application of a circular queue. 2
(b) Write down insert and delete algorithm of linear queue. 8
(c) What do you mean by single linked list and doubly linked list? 5
10. (a) Consider the following eight numbers 50, 33, 44, 22, 77, 35, 60 and 40. Display the construction of the binary search tree by inserting the above numbers in the given order. 7
(b) Write an algorithm to Insert an element in the queue and Delete an element from the queue. 8
11. (a) Write an algorithm for pre-order, post-order and in-order traversal of binary tree. 9
(b) Write down various differences between linear and non-linear data structure. 4
(c) What do you mean by complete binary tree? 3
