



**BRAINWARE UNIVERSITY**  
**Term End Examination 2020 - 21**  
**Programme – Diploma in Electrical Engineering**  
**Course Name – Data Structure and Algorithm**  
**Course Code - DEE304**

**Semester / Year - Semester III**

Time allotted : 75 Minutes

Full Marks : 60

[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 60=60

1. (Answer any Sixty )

(i) Algorithm is

- |  |  |
|--|--|
| a) Step by step process to solve a problem | b) Pictorial representation to solve a problem |
| c) Solving a problem anyhow                | d) All of these                                |

(ii) The theta notation represents

- |                |                |
|----------------|----------------|
| a) Upper bound | b) Lower bound |
| c) Tight bound | d) No bound    |

(iii) What does it mean when we say that an algorithm X is asymptotically more efficient than Y?

- |  |  |
|--|--|
| a) X will always be a better choice for small inputs | b) X will always be a better choice for large inputs |
| c) Y will always be a better choice for small inputs | d) X will always be a better choice for all inputs   |

(iv) Two factors that defines the efficiency of an algorithm are

- |                        |                         |
|------------------------|-------------------------|
| a) Time and space      | b) Space and complexity |
| c) Time and complexity | d) Time and data        |

(v) ..... is pictorial representation of an algorithm.

- a) Program
- b) Diagram
- c) Picture
- d) Flowchart

(vi) Column major order is a method to arrange elements sequentially .....

- a) Column wise
- b) Row wise
- c) Table wise
- d) Linear wise

(vii) In sparse matrix, most elements are

- a) 0
- b) empty
- c) 1
- d) 2

(viii) Elements of an array are stored in

- a) Linear manner
- b) Random manner
- c) Contiguous manner
- d) Top to bottom manner

(ix) ..... follow FIFO method.

- a) Stack
- b) Queue
- c) Linked List
- d) Circular Linked List

(x) Which of the following is not a type of Linked list?

- a) Singly Linked List
- b) Doubly Linked List
- c) Straight Linked List
- d) Circular Linked List

(xi) ..... memory allocation is used in Linked list.

- a) static
- b) dynamic
- c) linear
- d) random

(xii) How many pointer/s needed to implement double Linked list?

- a) 1
- b) 3
- c) 2
- d) 4

(xiii) In double Linked list, the last pointer holds

- a) Address of previous node
- b) Address of first node
- c) Address of next node
- d) Null

(xiv) Traversing back is not possible in which type of Linked list?

- a) Singly Linked List
- b) Doubly Linked List
- c) Straight Linked List
- d) Circular Linked List

(xv) Insertion operation in stack is called

- a) Pop
- b) Push
- c) Insert
- d) Delete

(xvi) The value of top (tos) when stack is empty

- a) 0
- b) -1
- c) 1
- d) 2

(xvii) The postfix representation of  $A*B+C$

- a)  $AB*C+$
- b)  $A*B+C$
- c)  $ABC*+$
- d)  $BC+A*$

(xviii) Insertion in queue is done through ..... end.

- a) front
- b) rear
- c) back
- d) last

(xix) What is the value of rear when queue is empty?

- a) 0
- b) 1
- c) -1
- d) 2

(xx) The value of front is incremented by 1 when data element is

- a) Inserted
- b) Searched

c) Deleted

d) None of these

(xxi) Dequeue is a process of

a) Insertion

b) Searching

c) Deletion

d) Traversal

(xxii) Relationship between rear and front to find the number of elements of queue

a)  $\text{Rear} - \text{front} + 1$

b)  $\text{Rear} - \text{front} - 1$

c)  $\text{Rear} + \text{front} + 1$

d)  $\text{Rear} - \text{front} - 1$

(xxiii) LIFO mean

a) Last in first out

b) Last input first out

c) Last in first output

d) Last input first output

(xxiv) Which of the following is/are way/s of storing data?

a) Stack

b) Linked list

c) Queue

d) All of these

(xxv) Which of the following is a linear data structure?

a) Array

b) Linked list

c) Stack

d) All of these

(xxvi) Which of the following is used to define a node in Linked list?

a) Structure

b) Variable

c) Array

d) All of these

(xxvii) What is the relationship between rear and front if queue is non empty?

a)  $\text{Rear} > \text{front}$

b)  $\text{Rear} = \text{front}$

c)  $\text{Rear} < \text{front}$

d) No relation

(xxviii) Pop operation in Stack give error when

- a) Stack is empty
- b) When stack is partially filled
- c) Stack is full
- d) Never gives error

(xxix) The address of the first element of an array is generally called

- a) First address
- b) Base address
- c) Start address
- d) Last address

(xxx) Which of the following is best suited for reversing?

- a) Stack
- b) Linked list
- c) Queue
- d) List

(xxxii) ..... is not a type of queue.

- a) Circular queue
- b) Double ended queue
- c) Ordinary queue
- d) Priority queue

(xxxiii) The queue where insertion and deletion can be performed from both ends is

- a) Priority queue
- b) Deque
- c) Circular queue
- d) Simple queue

(xxxiv) Traversing both way is possible in

- a) Singly Linked list
- b) Circular Linked list
- c) Doubly Linked list
- d) All of these

(xxxv) Deletion of an element is performed first in priority queue having

- a) High priority
- b) Same priority
- c) Low priority
- d) No priority

(xxxvi) Insertion operation, if the capacity of stack is full gives

- a) Stack overflow
- b) Stack no flow

c) Stack underflow

d) None of these

(xxxvi) Which of the following is easiest to implement?

a) Linear data structure

b) Two dimensional array

c) Non linear data structure

d) Multi dimensional array

(xxxvii) First node in Linked list is also called

a) head

b) initiate

c) tail

d) end

(xxxviii) Sorting means .....data elements in some order.

a) arranging

b) inserting

c) deleting

d) searching

(xxxix) The worst case time complexity of selection sort is

a)  $O(n^2)$

b)  $O(n)$

c)  $O(1)$

d)  $O(n \log n)$

(xl) The average case time complexity of merge sort is

a)  $O(n^2)$

b)  $O(n)$

c)  $O(\log n)$

d)  $O(n \log n)$

(xli) Which of the following sorting work best on almost sorted array?

a) Insertion

b) Merge

c) Quick

d) Heap

(xlii) The number of iterations in selection sort (ascending order) of an array = {3,4,5,2,1} are

a) 3

b) 2

c) 4

d) 5

(xliii) Quick sort follows

- a) Divide & conquer
- b) Brute force technique
- c) Greedy algorithm
- d) Dynamic programming

(xliv) Searching process will be easy if elements are

- a) Sorted
- b) Same for all
- c) Not sorted
- d) Not determined

(xlv) Searching in a linear manner is called

- a) Linear searching
- b) Binary searching
- c) Line searching
- d) Non linear searching

(xlvi) In ..... search, elements are checked from the beginning to end of the list.

- a) Linear
- b) Straight
- c) Binary
- d) Non linear

(xlvii) The fastest way to store and search data is

- a) Sorting
- b) Hashing
- c) Both Sorting & Hashing
- d) Indexing

(xlviii) Function used in hashing data structure is called

- a) Linear function
- b) Hash function
- c) Non linear function
- d) None of these

(xlix) The use of hashing is to search that takes

- a)  $O(1)$  time
- b)  $O(n)$  time
- c)  $O(\log n)$  time
- d)  $O(n \log n)$  time

(l) The element (1256) will be placed at position ..... using division method provided size of hash table is 10 and indexing start with 1.

- a) 17
- b) 7
- c) 16
- d) 6

(li) Which of the following operations is/are performed in a hash table?

- a) Insertion
- b) Searching
- c) Both Insertion & Searching
- d) Replacing

(lii) BST is a process of

- a) Sorting
- b) Searching
- c) Adding
- d) Deleting

(liii) The nodes with zero child node is called

- a) Root node
- b) Right node
- c) Left node
- d) Terminal node

(liv) A binary tree where each node has either 0 or 2 children

- a) Binary search tree
- b) Complete binary tree
- c) Extended binary tree
- d) Threaded binary tree

(lv) Full binary tree is

- a) Each node has 0, 1 or 2 children
- b) All leaves are at the same level
- c) Each node has exactly two children except leaf node
- d) Each node has 1 or 2 children

(lvi) A binary search tree where height of left sub tree and right sub tree differs by maximum 1 is

- a) Binary tree
- b) AVL tree
- c) B-tree
- d) Normal tree

(lvii) The root of a binary tree contains maximum

- a) 0 node
- b) 2 nodes



c) 1 node

d) 3 nodes

(lviii) Which of the following is not a tree traversal method?

a) Preorder

b) Shiftorder

c) Postorder

d) Inorder

(lix) In binary search tree, the nodes on the left side of root have values ..... than root.

a) less

b) not explicitly defined

c) greater

d) can be placed any side

(lx) The degree of a node is defined by

a) Number of node/s in left sub tree

b) Number of child node/s

c) Number of node/s in right sub tree

d) 2