



K22U 3583

Reg. No. :

Name :

**Third Semester B.C.A. Degree (CBCSS – OBE – Regular/Supplementary/
Improvement) Examination, November 2022
(2019 Admission Onwards)
GENERAL AWARENESS COURSE
3A12BCA : Data Structures**

Time : 3 Hours

Max. Marks : 40

**PART – A
(Short Answer)**

Answer **all** questions.

(6×1=6)

1. Name the data structure used to implement recursion.
2. List any two applications of binary tree.
3. Evaluate the postfix expression : $2\ 4\ +\ 4\ 6\ +\ *$
4. Define full binary tree.
5. What is the time complexity to search an element in a singly linked list ?
6. The linked list in which none of the nodes contains the NULL pointer is _____.

**PART – B
(Short Essay)**

Answer **any 6** questions.

(6×2=12)

7. Differentiate between linear and non-linear data structures.
8. What do you mean by priority queue ?
9. Differentiate between linear and binary search.
10. List the advantages of linked list over arrays.
11. Differentiate between linear and circular queue.
12. What are the advantages of a doubly linked list ?
13. Discuss the array representation of binary tree.
14. What is the time complexity to search a key in a binary search tree ? Justify your answer.

P.T.O.



PART – C

(Essay)Answer **any 4** questions.**(4×3=12)**

15. Discuss the representation of a two-dimensional array in memory.
16. Explain binary search algorithm with its complexity.
17. Discuss any three applications of stack.
18. What do you mean by singly linked list ? Write an algorithm to reverse any given linked list.
19. Create a binary search tree for the following numbers start from an empty binary search tree. 45, 26, 10, 60, 70, 30, 40 Delete keys 10, 60 and 45 one after the other and show the trees at each stage.
20. Discuss Huffman tree with its application.

PART – D

(Long Essay)Answer **any 2** questions.**(2×5=10)**

21. What do you mean by sparse matrix ? Write an algorithm to add two sparse matrices.
 22. Explain quick-sort algorithm with an example.
 23. Detail on linked representation of queue with algorithms for its primitive operations.
 24. Discuss in detail, stack data structure and implement the same using array.
-



K20U 1934

Reg. No. :

Name :

**III Semester B.C.A. Degree CBCSS (OBE) – Regular Examination, November 2020
(2019 Admission Only)
GENERAL AWARENESS COURSE
3A12BCA : Data Structures**

Time : 3 Hours

Max. Marks : 40

**PART – A
(Short Answer)**

Answer **all** questions. **(6×1=6)**

1. Define complexity of an algorithm.
2. What is the time complexity of a selection sort ?
3. What is FIFO ?
4. Define linked list.
5. Define tree.
6. What is the maximum number of nodes of a complete binary tree ?

**PART – B
(Short Essay)**

Answer **any 6** questions. **(6×2=12)**

7. Write down the operations of a data structure.
8. What is Deque ?
9. What is a doubly linked list ?
10. Write down the linked representation of a binary tree.
11. Write an algorithm for in order traversal of a tree.
12. Explain Huffman Code.
13. What is a stack ?
14. How to represent a polynomial with an array ?

P.T.O.



PART – C
(Essay)

Answer **any 4** questions.

(4×3=12)

15. Write down the algorithm for Tower or Hanoi.
16. Write an algorithm for bubble sort.
17. Convert the following expression into postfix and prefix : $P - Q / R - S + T * U$.
18. Evaluate the following expression using algorithm : $S = 5 + 6 / 3 - 4 + 7 * 2$.
19. What is the advantage of circular linked list ? Explain with example.
20. Write down the memory representation of an array.

PART – D
(Long Essay)

Answer **any 2** questions.

(2×5=10)

21. What is recursion ? Explain any two applications.
22. Compare quick sort and insertion sort.
23. What are the operations of a stack ? Explain.
24. Write an algorithm for insertion and deletion of an element of a linked list.



K21U 1935

Reg. No. :

Name :

**III Semester B.C.A. Degree CBCSS (OBE) Reg./Sup./Imp.
Examination November 2021
(2019-2020 Admission)
General Awareness Course
3A12BCA : DATA STRUCTURES**

Time : 3 Hours

Max. Marks : 40

**PART – A
Short Answer**

Answer **all** questions.

(6×1=6)

1. What do you mean by Data Structure ?
2. What is Recursion ?
3. What is time complexity of a binary search ?
4. What is merge sort ?
5. Name the operations used in stack.
6. Define circular linked list.

**PART – B
Short Essay**

Answer **any 6** questions.

(6×2=12)

7. Define Sparse matrix.
8. Explain selection sort.
9. What is the advantage of Doubly linked list ?
10. Explain Huffman code.

P.T.O.

K21U 1935



11. What is linked list ?
12. How to insert an element into a linked list ?
13. Write down the algorithm for Post-order traversal.
14. Define Binary Tree.

PART – C
Essay

Answer **any 4** questions.

(4×3=12)

15. Write down the algorithm for Tower of Hanoi.
16. How to represent array in memory ? What are the operations of an array ?
17. Write down the algorithm for quick sort.
18. Differentiate linear search and binary search.
19. Convert the following expression to postfix and prefix : $P / Q + R - S * T / U$.
20. Write down the algorithm for search an element from a sorted linked list.

PART – D
Long Essay

Answer **any 2** questions.

(2×5=10)

21. Explain the linked list operations.
22. Write an algorithm for conversion of infix to postfix expression. Explain.
23. Write down the memory representation of binary tree and binary search tree.
24. Define the following :
- a) Queue
 - b) Deque
 - c) Priority Queue.