15221

Reg. No. | | | | | | | | |

II Semester B.C.A. Degree Examination, September/October - 2022

COMPUTER SCIENCE

Data Structures

(CBCS Scheme)

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates :

Answer ALL Sections.

SECTION - A

I. Answer any **TEN** questions. Each question carries **TWO** marks: **(10×2=20)**

1. What is abstract Data type?
2. Define space and time complexity of an algorithm.
3. What is recursion?
4. What is dynamic memory auocation?
5. Mention any two disadvantages of an array.
6. Define sparse matrix.
7. Mention the application of queue.
8. State any two properties of a Binary Tree.
9. Define dequeue.
10. What is a circular queue?
11. Define the terms:
    i) Binary Tree
    ii) Complete Binary Tree
12. Give the node structure of a circular Linked list.

P.T.O.

SECTION - B

II. Answer any **FIVE** questions. Each question carries **10** marks: **(5×10=50)**

13. a) Illustrate asymptotic notations with an examples. **(5)**
    b) Explain the classification of data structures. **(5)**

14. a) Explain any five string handling functions. **(5)**
    b) Describe the concept of linear search technique with an example. **(5)**

15. a) Write an algorithm for push and POP operation of a stack. **(5)**
    b) Write a c-program to find GCD of two numbers using recursion. **(5)**

16. a) What is a queue? Explain the operations of a queue. **(5)**
    b) Write an algorithm to insert an element to a circular queue. **(5)**

17. a) Define a linked list. Explain different types of linked list. **(5)**
    b) Explain adjacency matrix and adjacency list with suitable examples. **(5)**

18. a) Convert an infix expression Q = (A + (B * C – D / E ↑ F)*G)* H to POST fix expression **(5)**
    b) Expalin different types of priority Queues. **(5)**

19. What is a tree? Explain different tree traversal techniques with an algorithm. **(10)**

20. What is Tree traversal? Write all tree traversal for the following binary tree. **(10)**