

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2022
(Second Semester)

Branch – COMPUTER SCIENCE WITH DATA ANALYTICS

DATA STRUCTURES

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. Stack is an example for
(i) Basic Data type (ii) Linear Data Structure
(iii) Non-Linear Data Structure (iv) All of these
2. Which is the best technique if random of few elements are sorted in a list
(i) Bubble Sort (ii) Selection Sort
(iii) Radix Sort (iv) Insertion Sort
3. The Data Structure which is possible to move through the list in both directions is
(i) Queue (ii) Stack
(iii) Doubly Linked List (iv) Arrays
4. The Prefix Notation of $A*B + C*D$ is
(i) $+*AB*CD$ (ii) $*AB+*CD$
(iii) $+++ABCD$ (iv) $**+ABCD$
5. In what tree for every node the height of its left & right sub tree differs at least by one
(i) Binary tree (ii) Binary Search Tree
(iii) AVL Tree (iv) All of these

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

6. a) Write a note about Array representation in memory.
(Or)
b) Define Sparse Matrices with example.
7. a) Write an algorithm for Bubble Sort.
(Or)
b) List out some popular Hash functions in Hashing.
8. a) Describe the algorithm for traversing in a Linked List.
(Or)
b) Demonstrate the representation of $P(x) = 2x^5 + 5x^3 - 3x^2 + 4$ in doubly linked list.
9. a) Evaluate the following postfix notation using Stack.
Postfix form: 5 6 2 + * 12 4 / -
(Or)
b) Write a procedure to calculate Factorial of n using Recursion.
10. a) Write an algorithm for Pre-order traversal for Binary Tree.
(Or)
b) Construct a Heap for the following elements 90,80,70,60,50

Cont...

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

11. a) Explain how the efficiency of an algorithm is measured by using Time and Space.
(Or)
b) Perform the following operation in the String 'Data Structure'.
i) Length ii) Substring iii) Concatenation
12. a) Compute Quick Sort algorithm for the given List $L = \{92,56,54,87,12,60\}$.
(Or)
b) Explain Binary Search algorithm with example.
13. a) Explain the memory representations of Linked List.
(Or)
b) Illustrate insertion and deletion operations on Doubly Linked List.
14. a) Convert Postfix and Prefix Notation for the following expression.
i) $B^{**2} - 4 * A * C / 2 * A$ ii) $A^{**3} + B^{**2} - C * 2 - D / 3$
(Or)
b) Explain the Insertion and deletion of Queue.
15. a) Explain the Binary search Traversal Algorithm with example.
(Or)
b) Describe the AVL Search Trees with examples.

Z-Z-Z

END