

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BVoc DEGREE EXAMINATION MAY 2022
(Second Semester)

Branch - NETWORKING AND MOBILE APPLICATION

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. Which of these best describes an array?
 - i) A data structure that shows a hierarchical behavior
 - ii) Container of objects of similar types
 - iii) Arrays are immutable once initialized
 - iv) Array is not a data structure
2. What is an internal sorting algorithm?
 - i) Algorithm that uses tape or disk during the sort
 - ii) Algorithm that uses main memory during the sort
 - iii) Algorithm that involves swapping
 - iv) Algorithm that are considered 'in place'
3. A linear collection of data elements where the linear node is given by means of pointer is called _____
 - (i) Linked list
 - (ii) Node list
 - (iii) Primitive list
 - (iv) None
4. In a stack, if a user tries to remove an element from an empty stack it is called _____
 - (i) Underflow
 - (ii) Empty collection
 - (iii) Overflow
 - (iv) Garbage Collection
5. What is a full binary tree?
 - (i) Each node has exactly zero or two children
 - (ii) Each node has exactly two children
 - (iii) All the leaves are at the same level
 - (iv) Each node has exactly one or two children

SECTION - B (15 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 3 = 15)

6. a. Explain the concept of Pointers in data structures.
(OR)
 - b. Write down the Applications of matrices and sparse matrices.
7. a. Define Sorting. Explain Merge sort in detail.
(OR)
 - b. Demonstrate Selection sort in detail.
8. a. Explain the operations of singly linked lists.
(OR)
 - b. Write short note on Dynamic memory allocation.

Cont...

9. a. Describe the usage of stack in recursive algorithm implementation.
(OR)
b. Describe priority queue with diagram and give the operations.
10. a. Define Tree. Explain with an example.
(OR)
b. Explain binary tree traversal with an example.

SECTION – C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

11. a. How can a sparse matrix be represented in memory? Explain.
(OR)
b. How many types of arrays are there in data structure? Explain.
12. a. Discuss in detail about quick sort algorithm with suitable example.
(OR)
b. Classify the common collision resolution strategies used in closed hashing system.
13. a. Write a procedure to insert, delete operation on doubly linked list with suitable algorithms.
(OR)
b. Illustrate the following searching techniques
i) Linear Search ii) Binary Search
14. a. Write down an algorithm for push and pop operations on stack using Linked list.
(OR)
b. Explain the enqueue and dequeue operations performed on circular queue with necessary algorithms.
15. a. Write down the performing insert and delete operations in a Binary Search Tree (BST) with suitable example.
(OR)
b. Describe the algorithms used to perform single and double rotation on AVL Tree .

Z-Z-Z END