

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCA DEGREE EXAMINATION DECEMBER 2022
(Second Semester)

Branch – COMPUTER APPLICATIONS

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 one of the following operation accesses each record exactly once so that certain items may be processed?
(i) Inserting (ii) Deleting
(iii) Traversing (iv) Searching
- 2 Choose the correct worst case complexity of Insertion sort algorithm.
(i) $O(n^2)$ (ii) $O(n)$
(iii) $O(\log n)$ (iv) $O(n \log n)$
- 3 Find the type of linked lists that can be traversed in two directions.
(i) Singly Linked List (ii) Doubly Linked Lists
(iii) Circular Linked Lists (iv) None of the above
- 4 Which of the following data structures that allow insertion and deletion from both ends?
(i) Stack (ii) Strings
(iii) Queue (iv) Deque
- 5 Identify the correct statement
(i) A connected graph T without any cycles is called tree graph
(ii) A directed graph G also called digraph
(iii) Game evaluation is an example of Directed Acyclic Graphs
(iv) All of the above

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a. Sketch the concept of Abstract Data Type.
OR
b. Summarize String Operations.
- 7 a. Develop an algorithm for Bubble Sort with working procedure.
OR
b. State an example and discuss Radix Sort.
- 8 a. Describe Traversing a Linked List algorithm.
OR
b. Explain deleting the node with a given item of information in Linked List.

Cont...

- 9 a. Translate the following expression into Postfix Expression
 (i) $((A + B) * D) \uparrow (E - F)$
 (ii) $A + (B * C - (D / E \uparrow F) * G) * H$

OR

- b. Describe Circular Queue and its implementation.
- 10 a. How to traverse the nodes in a binary tree with suitable example?
 OR
 b. Narrate the working procedure of Warshall's algorithm.

SECTION -C (30 Marks)

Answer ALL questions
 ALL questions carry EQUAL Marks

(5 x 6 = 30)

- 11 a. Classify the types of Data Structures.

OR

- b. Outline the Multidimensional Arrays.

- 12 a. Summarize how informal description of Merge Sort will translate into formal algorithm.

OR

- b. Discover and demonstrate the Selection Sort results of each pass for the following initial array of elements: 77, 33, 44, 11, 88, 22, 66, 55.

- 13 a. Distinguish between One-way List and Two-way Lists.

OR

- b. Demonstrate the two search algorithms in linked list for finding the location of the node where item first appears in List.

- 14 a. Discuss in detail about Stack and its operations.

OR

- b. Analyze the procedure to add and delete an element in Queue with example.

- 15 a. Infer and explain the algorithm to perform Heap Sort.

OR

- b. Elucidate about Graph traversal technique.

Z-Z-Z

END