

**PSG COLLEGE OF ARTS & SCIENCE**  
(AUTONOMOUS)

**BSc DEGREE EXAMINATION MAY 2026**  
(Second Semester)

Common to Branches – **COMPUTER SCIENCE/ INFORMATION TECHNOLOGY/  
COMPUTER TECHNOLOGY/ NETWORKING AND MOBILE  
APPLICATIONS**

**DATA STRUCTURES**

Time: Three Hours

Maximum: 75 Marks

**SECTION-A (10 Marks)**

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 × 1 = 10)

| Module No. | Question No. | Question                                                                                                                  | K Level | CO  |
|------------|--------------|---------------------------------------------------------------------------------------------------------------------------|---------|-----|
| 1          | 1            | Which of the following is a linear data structure?<br>(i) Tree (ii) Graph<br>(iii) Array (iv) Network                     | K1      | CO1 |
|            | 2            | Time complexity is a measure of<br>(i) Program size<br>(ii) Memory usage<br>(iii) Execution time growth<br>(iv) CPU speed | K2      | CO1 |
| 2          | 3            | Which sorting algorithm is simplest?<br>(i) Quick sort (ii) Merge sort<br>(iii) Bubble sort (iv) Heap sort                | K1      | CO2 |
|            | 4            | Binary search works only on<br>(i) Unsorted list (ii) Sorted list<br>(iii) Linked list (iv) Stack                         | K2      | CO2 |
| 3          | 5            | Which linked list allows traversal in both directions?<br>(i) Singly<br>(ii) Circular<br>(iii) Doubly<br>(iv) Linear      | K1      | CO3 |
|            | 6            | Which operation is costly in linked list?<br>(i) Insertion<br>(ii) Deletion<br>(iii) Traversal<br>(iv) Random access      | K2      | CO3 |
| 4          | 7            | In Stack Push operation inserts element at<br>(i) Bottom (ii) Middle<br>(iii) Top (iv) End                                | K1      | CO4 |
|            | 8            | Infix to postfix conversion uses<br>(i) Queue<br>(ii) Stack<br>(iii) Graph<br>(iv) Tree                                   | K2      | CO4 |
| 5          | 9            | BST property states<br>(i) Left < Root < Right<br>(ii) Left > Root<br>(iii) Root is maximum<br>(iv) No condition          | K1      | CO5 |
|            | 10           | Shortest path problem uses<br>(i) DFS<br>(ii) BFS<br>(iii) Dijkstra<br>(iv) Heap sort                                     | K2      | CO5 |

Cont...

**SECTION - B (35 Marks)**

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 7 = 35)

| Module No. | Question No. | Question                                                        | K Level | CO  |
|------------|--------------|-----------------------------------------------------------------|---------|-----|
| 1          | 11.a.        | Analyze the advantages and limitations of arrays.               | K4      | CO1 |
|            |              | (OR)                                                            |         |     |
|            | 11.b.        | Examine representation of the sparse matrix with an example.    |         |     |
| 2          | 12.a.        | Explain the insertion sort with algorithm with example.         | K2      | CO2 |
|            |              | (OR)                                                            |         |     |
|            | 12.b.        | Compare linear search and binary search.                        |         |     |
| 3          | 13.a.        | Summarize the algorithm for deletion operations in linked list. | K2      | CO3 |
|            |              | (OR)                                                            |         |     |
|            | 13.b.        | Interpret the representation of linked list in memory.          |         |     |
| 4          | 14.a.        | Examine the various operations of stack with algorithm.         | K5      | CO4 |
|            |              | (OR)                                                            |         |     |
|            | 14.b.        | Analyze the procedure for priority queue with example.          |         |     |
| 5          | 15.a.        | List and explain the basic terminology of a graph.              | K4      | CO5 |
|            |              | (OR)                                                            |         |     |
|            | 15.b.        | Analyse the salient features of heap sort algorithm.            |         |     |

**SECTION -C (30 Marks)**

Answer ANY THREE questions

ALL questions carry EQUAL Marks

(3 × 10 = 30)

| Module No. | Question No. | Question                                                                | K Level | CO  |
|------------|--------------|-------------------------------------------------------------------------|---------|-----|
| 1          | 16           | Distinguish between the time complexity and space complexity.           | K4      | CO1 |
| 2          | 17           | Explain the algorithm for selection sort and analyse its performance.   | K2      | CO2 |
| 3          | 18           | Evaluate the traversal and searching in linked list with example.       | K5      | CO3 |
| 4          | 19           | Compare the infix, prefix, and postfix expressions with example.        | K2      | CO4 |
| 5          | 20           | Examine the algorithm for insertion and deletion of binary search tree. | K4      | CO5 |

Z-Z-Z

END