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**BCA-204**  
**B.C.A. II Year Examination, 2016**  
Paper-IV  
(Data Structures Using C)

Time : Three Hours  
Maximum Marks : 100

**PART - A (खण्ड-अ)** [Marks : 20]

Answer all questions (50 words each).  
All questions carry equal marks.

सभी प्रश्न अनिवार्य हैं। प्रत्येक प्रश्न का उत्तर पचास शब्दों से अधिक न हो।  
सभी प्रश्नों के अंक समान हैं।

**PART - B (खण्ड-ब)** [Marks : 50]

Answer five questions (250 words each).  
Selecting one from each unit. All questions carry equal marks.

प्रत्येक इकाई से एक-एक प्रश्न चुनते हुए, कुल पाँच प्रश्न कीजिए।  
प्रत्येक प्रश्न का उत्तर 250 शब्दों से अधिक न हो।  
सभी प्रश्नों के अंक समान हैं।

**PART - C (खण्ड-स)** [Marks : 30]

Answer any two questions (300 words each).  
All questions carry equal marks.

कोई दो प्रश्न कीजिए। प्रत्येक प्रश्न का उत्तर 300 शब्दों से अधिक न हो।  
सभी प्रश्नों के अंक समान हैं।

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P.T.O.

PART-A

UNIT - I

1. (i) Define arrays.

(ii) Define structures.

UNIT - II

(iii) What is linked list and its pointers ?

(iv) Differentiate between array and linked list.

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UNIT - III

(v) Define tree.

(vi) What is full binary tree ?

UNIT - IV

(vii) Define Adjacency matrix.

(viii) Define multigraph and connected graph.

UNIT - V

(ix) Define sorting.

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(x) What is linear search.

**PART-B**

**UNIT - I**

2. What is queue ? Explain the implementation of queue using linked list with an algorithm to insert and item in the queue.

3. Explain various operations performed on arrays with algorithms.

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**UNIT - II**

4. Explain doubly linked list & its various operations.

5. Explain circular linked list & its various operations.

**UNIT - III**

6. Explain various tree traversal techniques in recursive manner with algorithm.

7. Explain various tree terminology & representation ways of binary tree.

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**UNIT - IV**

8. Define graph. Explain various terminologies and representation ways of graph.

9. Explain the following :

- (a) Transitive closure & reflexive transitive closure
- (b) Shortest path algorithm

**UNIT - V**

10. What is Hashing ? Explain various hash functions.

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11. Explain binary search algorithm and differentiate between binary search and linear search.

**PART-C**

**UNIT - I**

12. Describe stack. Explain stack operations along with algorithm and example.

**UNIT - II**

13. Explain the various operations that can be performed on a singly linked list and write algorithm of creation of linked list and traversing.

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### UNIT - III

14. Explain binary search tree (BST) with algorithms of insertion and deletion of a node.

### UNIT - IV

15. Write a short note on following :

- (a) Breadth First Search (BFS)
- (b) Depth First Search (DFS)

### UNIT - V

16. What is sorting ? Explain any types of sorting in detail with algorithm.