S.No. 1651

12UCA03

(For the candidates admitted from 2012–2013 onwards)

B.C.A. DEGREE EXAMINATION,
NOVEMBER 2017.

Third Semester

DATA STRUCTURES AND ALGORITHMS

Time : Three hours   Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Define the term 'data structure' briefly.

2. What is meant by a data type? Give an example.

3. Define an Array with an example.

4. Explain the term 'stack underflow'

5. Explain a linked list with an example.

6. Name the function used to allocate memory dynamically.

7. Define a tree with an example.

8. What is meant by traversal in a data structure?

9. Explain the necessity of process of swapping at times in sorting methods.

10. Explain the term worst-case with respect to searching an element.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

All questions carry equal marks.

11. (a) Discuss the non-linear type of data structures briefly.

Or

(b) Explain the characteristics of an algorithm.

12. (a) Discuss any three stack-related terms.

Or

(b) Illustrate the representation of a multidimensional array.

13. (a) Write an algorithm to count the number of nodes in a singly linked list.

Or

(b) Discuss the structure of a singly linked list.

14. (a) What is an Adjacency Matrix? Explain briefly with an example.

Or

(b) Explain the linked representation of a graph.

15. (a) Explain the Complexity of Insertion sort algorithm.

Or

(b) Write an algorithm for binary search.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain the term 'Time-space trade-off' of an algorithm with an example.

17. Explain the procedure to convert A+B*C–D/E into its equivalent postfix notation.

18. What is meant by 'pushing'? Explain briefly. Also explain how to delete an element from a Queue.

19. Explain the implementation of binary trees.

20. Discuss quick sort in detail with an example.

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