12 UCA 03

(For the candidates admitted from 2012–2013 onwards)

B.C.A. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

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 an Algorithm.

2. What is abstract data type?

3. How does the pointer array are useful?

4. What is the use of 'Size of' function?

5. What is meant by 'POP' operation?

6. Define Binary Buddy System.

7. Mention the type of De-Queues.

18. Explain the procedure to 'push' an element in a stack.

19. Discuss in detail about the application of Graph with an example.

20. Explain how 'Quick sort' can be viewed as an application of stack.

————

4

8. Mention the types of binary trees briefly.

9. What is meant by indexed search technique?

10. Define searching with an example.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

All questions carry equal marks.

11. (a) What is meant by 'frequency count' of an algorithm? Explain briefly.

Or

(b) Mention Big 'O' Notation in an algorithm briefly with an example.

12. (a) How does the array is initialized? Illustrate in detail.

Or

(b) Write an algorithm to print a string in reverse order.

13. (a) Discuss the polynomial representation briefly.

Or

(b) Write any two applications of a Stack in detail.

14. (a) Discuss briefly about the two ways of implementing a binary tree.

Or

(b) Explain the preorder traversal of a binary tree.

15. (a) Discuss hashing function using division/reminder method.

Or

(b) Explain 'Merge sort' briefly with an example.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Mention any four rules for writing an efficient algorithm and discuss.

17. Write an Algorithm to multiply two matrices.

(For the candidates admitted from 2012-2013 onwards)

B.Sc. DEGREE EXAMINATION,
NOVEMBER/DECEMBER 2014.

Third Semester

Computer Science

DATA STRUCTURES AND ALGORITHMS

Time : Three hours   Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Define space complexity of an algorithm.

2. Write an algorithm for GCD between two numbers.

3. Define sparse matrices.

4. What are the basic rules to convert an infix expression into a postfix form?

5. Define Deque.

6. What is meant by LENGTH (Q) and EMPTY (Q)?

7. Define Round-Robin algorithm.

8. What are the major operations of binary tree?

9. What is the usage of hashing algorithm?

10. Define heap sort.

PART B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) How to analyse the efficiency of algorithm? Explain.

Or

(b) How to design an algorithm? Discuss any three approaches to design an algorithm.

12. (a) Give a brief account of on two-dimensional arrays.

Or

(b) What are the steps involved in factorial calculation. Explain with an algorithm.

13. (a) Define linked list. Discuss any one of the types of linked list.

Or

(b) How to represent queue using linked list?

14. (a) What are the types of binary trees? Explain any one of them.

Or

(b) What is meant by minimum spanning tree? Discuss.

15. (a) What is searching? Write about linked or sequential search.

Or

(b) Discuss about bubble sort with algorithm.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss about primitive data structures.

17. What is meant by 1-dimensional array? Explain the memory-allocation and operations of an array.

18. Explain various queue structures in detail.

19. Explain briefly about operations on binary tree.

20. Explain any two sorting algorithm with examples.

—————