Roll No. .....

97670

BCA 3rd Semester (New) Examination – November, 2017

DATA STRUCTURE-I

Paper : BCA-202

Time : Three Hours] *[Maximum Marks : 80*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all. Question Number **1** will be ***compulsory***. In addition to compulsory question, student will have to attempt ***four*** more questions selecting ***one*** question from each Unit. All questions carry equal marks.

1. Explain the following :

(a) Time-space tradeoff

(b) Data type vs. data structure

(c) Sparse arrays

(d) Graph theory

(e) Storing strings

(f) Threaded lists

(g) Uses of Deques

(h) Uses of trees in data structure

UNIT – I

2. (a) What is Data Structure ? Explain the categories of Data structures in detail .

(b) Explain the applications of data structures in detail.

3. What is String ? What are different string operations ? Also Explain the Pattern matching algorithms in detail.

UNIT – II

4. (a) What is Linked list ? What are the advantages and disadvantages of representing a group of items as an array versus a linear linked list ?

(b) Discuss the advantages and disadvantages of linked list over the array. Also explain the usefulness of an Array.

5. (a) What is an Array ? Differentiate between one-dimensional and two-dimensional arrays with example.

(b) Explain header link list and circular linked list with example.

UNIT – III

6. (a) What is stack ? Explain the applications of stack in detail.

(b) Explain the concept of priority queues in detail with suitable example.

7. (a) Explain the different operations on stacks in detail through example.

(b) What is queues ? Also explain the applications of queues in detail.

UNIT – IV

8. What is graph ? Explain Sequential and linked representation of graphs in detail.

9. (a) Define Tree. What do you mean by Traversing binary trees ? Explain in detail.

(b) Explain the concept of Traversal algorithms using stacks in detail.

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1. (a) What is string ?

(b) Describe the Big-O notation.

(c) What is doubly linked list ?

(d) Write the advantages of circular list.

(e) What is recursion ?

(f) What is priority queue ?

(g) Write the properties of binary tree.

(h) What is a graph ?

UNIT – I

2. (a) What is the need of data structure ? Discuss various types of data structure.

(b) What do you mean by efficiency of an algorithm ? Explain the concept of best case, average case and worst case time complexity.

3. What do you mean by pattern matching ? Explain various patterns matching algorithm by using example.

UNIT – II

4. What is an array ? Discuss the various operations on linear array and write an algorithm for inserting and deleting an element into a linear array.

5. What is the difference between array and linked list ? How can you represent a linked list in memory ? Explain the insertion and deletion operations of linked list by giving suitable example.

UNIT – III

6. (a) What are the basic operations performed on stack ? Write down the steps to perform these operations.

(b) What is postfix notation ? Explain the method of evaluating postfix expression by giving suitable example.

7. What are queues ? How are queues implemented in memory ? What are the various queue operations ? Write algorithm for each.

UNIT – IV

8. What is binary tree and strictly binary tree ? Explain the various methods of representation a binary tree in memory.

9. What is meant by traversal of a graph ? Discuss the breadth first and depth first traversal techniques with the help of example.
