II Semester B.C.A. Degree Examination, May 2017
(F + R) (CBCS)
(2014-15 and Onwards)
COMPUTER SCIENCE
BCA – 203 : Data Structures

Time : 3 Hours
Max. Marks : 70

Instruction : Answer all Sections.

SECTION – A

Answer any ten questions. Each question carries two marks. (10x2=20)

1. What is linear data structure? Give an example.
2. Define space and time complexities of an algorithm.
3. What is recursion?
4. What is dynamic memory allocation?
5. Define stack.
6. Compare linear search and binary search methods.
7. What is circular queue?
8. Write the differences between stack and queue.
9. Give the node structure of a doubly linked list.
10. Define the terms:
    i) Binary tree.
    ii) Complete binary tree.
11. Mention the different ways of tree traversal.
12. Mention the graph traversal methods.

P.T.O.
SECTION – B

Answer any five questions. Each question carries ten marks. (5×10=50)

13. a) Explain various types of data structures.
   b) Briefly explain any four string handling functions.

   b) Write an algorithm to delete an element from the array.

15. a) Define linked list. Mention the applications of the linked list.
   b) Write an algorithm for searching a node in the singly linked list.

16. a) Mention various applications of the stack.
   b) Evaluate the following postfix expression
      \[ 95 + 36 \times 97 - 1. \]

17. a) Write C functions to perform insertion and deletion operations of a queue.
   b) What is queue? Mention its underflow and overflow conditions.

18. a) Briefly explain infix, prefix and postfix expressions.
   b) Convert the following infix expression into its equivalent postfix expression
      \[(a + b) \times (m/n) + (x + y).\]

19. a) Define the terms (a) Graph (b) Degree of a vertex.
   b) Write depth-first-search algorithm.

20. a) Define Binary search tree. Give an example.
   b) Briefly explain various tree traversal methods with suitable examples.