



III Semester B.A./B.Sc. Examination, Nov./Dec. 2015
(Semester Scheme) (2014-15 Only) (Repeaters)
COMPUTER SCIENCE – III
Data Structures and Algorithms

Time : 3 Hours

Max. Marks : 70

Instruction : Answer all Sections.

SECTION – A

- I. Answer any 10 questions. Each question carries 2 marks. (2×10=20)
- 1) Write common operations performed on primitive data structure.
 - 2) What is singly linked list ?
 - 3) What is a header node ? Explain.
 - 4) What is recursion ?
 - 5) What is Queue overflow and Queue underflow condition ?
 - 6) What is parent node and child node ?
 - 7) List any two advantages of a linked list.
 - 8) Write any two advantages of arrays.
 - 9) Write a formula for column major ordering.
 - 10) Write two applications of stack.
 - 11) What is time and space complexity ?
 - 12) What is a priority Queue ? List the types of it.

SECTION – B

- II. Answer the following. Each question carries 10 marks. (5×10=50)
- 13) a) i) Write an algorithm for selection sort. 5
 - ii) Write the advantages of linked list over arrays. 5
- OR
- b) i) Write a note on sentinal nodes and garbage collection. 5
 - ii) Write an algorithm to insert a node at the end of the linked list. 5

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- 14) a) i) Write an algorithm for linear search and explain. 5
ii) Write an algorithm to insert an element into the circular queue. 5
OR
- b) Explain towers of Hanoi for three disks. 10
- 15) a) i) Write a note on input restricted and output restricted Dequeues. 5
ii) Explain Depth first search algorithm. 5
OR
- b) i) Write a recursive algorithm for post order traversal. 5
ii) What are the different operations performed on strings? Give example. 5
- 16) a) Explain different types of Graphs. 10
OR
- b) Explain various terminologies associated with trees. 10
- 17) a) i) What is a stack? Explain the two ways in which it can be implemented? 5
ii) Write an algorithm for push and pop operations in stack. 5
OR
- b) i) Write an algorithm to delete an element from the circular queue. 5
ii) Explain the linked list representation of a binary tree. 5
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