

2063
B.E. (Computer Science and Engineering)
Third Semester
CS-301: Data Structures

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Part.

x-x-x

- 1) Answer the following 1×10=10
- a) Solve the recurrence:
 $T(n) = C + 3T(n-1)$, if $n > 1$
 $T(n) = C$, otherwise
- b) Give the infix expression of the following prefix expression:
* / - A B C D
- c) List the applications of stacks.
- d) What is the time complexity of merge sort algorithm?
- e) List different types of queues.
- f) What is the worst case time complexity of radix sort?
- g) What is undirected graph?
- h) What is adjacency list?
- i) How breadth first search differs from depth first search?
- j) How does the height of a binary search tree affect its performance?

PART-A

- 2) Convert the following arithmetic expression infix notation to postfix notation using stack, and show the status of the stack after every step. (10)
 $A + ((B + C) * D) / F * G + H$
- 3) Write a function to add two long integers of the same sign represented by doubly linked lists. (10)
- 4) Sort the following elements in increasing order using quick-sort algorithm (10)
21,11,15,33,55,42,78,17,50

PART B

- 5) Write a function to determine if a binary tree is (5,5)
a) Strictly binary
b) complete
- 6) Explain depth first search method with the help of an example. (10)
- 7) What is collision in hashing? How collisions are resolved using open addressing? Explain with the help of an example. (3,7)

x-x-x

