

MASTER OF COMPUTER APPLICATIONS DEGREE
EXAMINATIONS, JULY - 2017
SECOND SEMESTER

PAPER MCA 202 : DATA STRUCTURES USING JAVA
(Under C.B.C.S Revised New Regulations w.e.f. 2016-2017)
(Common Paper to University and all Affiliated Colleges)

Time : 3 Hours

Max. Marks : 80

Part - A

(Compulsory)

Answer any Five of the following questions. Each question carries 4 marks. (5 × 4 = 20)

1. a) Define Time Complexity. Explain Asymptotic notations to evaluate Time complexity.
- b) Write an algorithm to perform the operation on Stack using Linked list implementation.
- c) What are the applications of trees. Explain.
- d) Discuss Adjacency matrix and linked representation of Graph.
- e) Write the procedure to implement double rotations while inserting nodes in an AVL Tree.
- f) Define Heap. Write an algorithm for delete heap.
- g) Write a program to implement insertion sort for 'N' numbers.
- h) Write and explain quick sort for the given set of numbers : 34, 21, 5, 7, 98, 54, 10
- i) Explain the different hashing techniques.
- j) Write a method to implement linear search method.

Part - B

Answer any One full question from each Unit. Each question carries 12 marks.

(5 × 12 = 60)

Unit-I

2. i) Write an algorithm to insert an element in a circular queue. (5)
- ii) Write a program to add two polynomials using linked list. (7)

12-00-2-03

(1)

[P.T.O.]

2876262
2876236

60-55

OR

3. i) Write an algorithm for converting infix expression to postfix. Trace the algorithm for the expression. $((a+b^c)/((d*e)+g)*h)$ (6)
- ii) Design an algorithm to implement operations on Queue using linked list as a storage structure. (6)

Unit-II ✓

4. i) Write and explain the method for Union operation. (6)
- ii) Define Graph. Explain the various types of graph traversal methods. (6)

OR

5. i) Write a note on Threaded binary trees. (4)
- ii) Define Tree. Explain different types of tree traversals with example. (8)

Unit-III ✓

6. i) Write a procedure to implement operations on Red-Black tree. (8)
- ii) Discuss the properties of splay trees. (4)

OR

7. i) Write a program to implement operations on Leftist Heap. (8)
- ii) What are the difference between AVL tree and Red-Black Tree? Discuss. (4)

Unit-IV ✓

8. i) Write a program to implement k-way merge algorithm for 'n' numbers. (7)
- ii) Calculate the Time complexity for polyphase merge sort algorithm. (5)

OR

9. i) Write and trace a method for Heap Sort to the given set of numbers : (8)
34, 3, 87, 50, 43, 9
- ii) Calculate the time complexity for insertion sort method. (4)

Unit-V ✓

10. i) Write a program for binary search method and find the time complexity. (7)
- ii) Write a note on B-Tree indexing. (5)

OR

11. i) Explain hash indexing with example. (5)
- ii) How to perform searching of a particular record using cylinder surface indexing? (7)
Give example.



(2)

12-00-2-03