

ROLL NO. _____

ENROLLMENT NO. _____

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING, SCHOOL OF ENGINEERING SCIENCES
& TECHNOLOGY, JAMIA HAMDARD**

SUPPLEMENTARY/IMPROVEMENT EXAMINATION 2023

BTCSE 303 (Lateral Entry)

Data Structure & Algorithms

TIME: 3 HRS**MAXIMUM MARKS: 75**

Note: Do not write anything on paper except Roll No. & Enrollment No. Use of mobile phone is not allowed.

Please follow proper numbering while answering the questions Proper steps are required to be specified for all questions

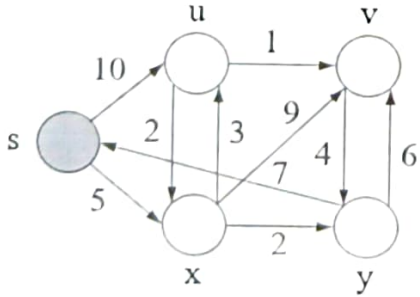
SECTION A

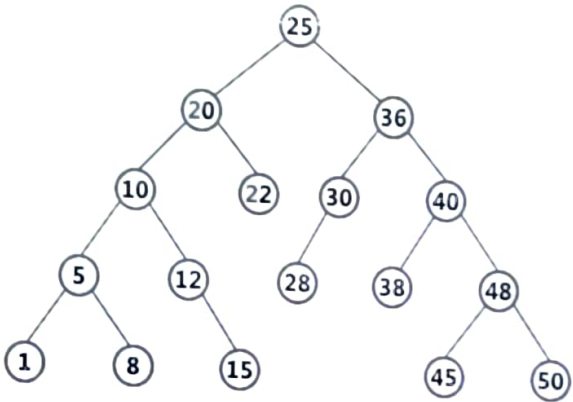
All questions of Section A are compulsory (7*5)

S.NO	QUESTIONS	MARKS	CO	BL
Q1.	Write an algorithm to concatenate three singly linked lists.	5	CO2	L3
Q2.	Sort the following numbers using merge sort technique. Illustrate the process. 90, 14, 27, 36, 11, 85, 59, 30, 99	5	CO3	L2
Q3.	What is the advantage of two-way linked list over singly linked list? Write the algorithm for insertion and deletion in a two-way linked list.	5	CO2	L1
Q4.	For following expressions, construct the corresponding binary tree and perform their pre-order, in-order and post-order traversal. 1. $A+B-F/C*D-E+G$ 2. $((A+B)-(C\%D))*((E\wedge F)/(G-H))$	5	CO1	L4
Q5.	What are AVL Search trees? Explain the different rotations applied for insertion in an AVL search trees.	5	CO4	L5
Q6.	What is the benefit in using heap sort over selection sort? Explain the procedure for heapsort using an example.	5	CO5	L6
Q7.	What is the need of stack data structure? Explain the scenarios in which stack gives better performance than other data structures.	5	CO4	L3

SECTION B

Answer any 4 questions in Section B (4*10)

S.NO	QUESTIONS	MARKS	CO	BL
Q1.	Find the shortest path in the given graph using Dijkstra's Algorithm. The starting node for the following graph is node s. 	10	CO3	L2

Q2.	Convert the following infix expression to postfix using Stack: $A+(B*C-(D/E^F)*G)*H$	10	CO3	L3
Q3.	Which sorting algorithm in its typical implementation gives worst performance when applied on an array which is sorted. Apply the same algorithm on the following set of numbers: 42, 35, 56, 88, 45, 78, 23, 37, 10, 99	10	CO1	L1
Q4.	What are the steps for inorder, preorder and postorder traversal? Identify the type of the tree given below and perform its inorder, preorder and postorder traversal. 	10	CO4	L4
Q5.	What is the difference between a priority queue and circular queue? Explain their linked representation using examples.	10	CO5	L5
Q6.	What is the advantage offered by AVL search trees over other types of trees? Construct an AVL search tree for the following list of elements. 5, 3, 21, 9, 22, 25, 26, 27, 97, 96, 10, 12, 4, 8	10	CO2	L6

BLOOMS TAXANOMY LEVELS (BL)

1-REMEMBERING, 2-UNDERSTANDING, 3-APPLYING, 4-ANALYSING,
5-EVALUATING, 6-CREATING