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School of Computing Science and Engineering

Master of Technology in Computer Science and Engineering

Mid Term Examination - Nov 2023

Duration : 90 Minutes

Max Marks : 50

Sem I - E2PV101T - Advanced Design and Analysis of AlgorithmsGeneral Instructions*Answer to the specific question asked**Draw neat, labelled diagrams wherever necessary**Approved data hand books are allowed subject to verification by the Invigilator*

- 1) Construct the tree structure using Red black tree insert the value of 2, 1, 4, 5, 9, 3, 6, 7 K3 (6)
- 2) Construct AVL tree for the following data 21,26,30,9,4,14,28,18,15,10,2,3,7 K3 (9)
- 3) Calculate the Data Space required for the following given code K4 (8)

```
int sum (int A[], int n)
{
int sum = 0, i;
for (i = 0; i < n; i++)
sum = sum + A[i];
return sum;
}
```
- 4) Discuss various methods used for mathematic analysis for recursive and non-recursive algorithms. K5 (15)
- 5) We saw that the solution of $T(n) = 2T(n/2) + n$ is $O(n \lg n)$. Show that the solution of this recurrence is also $\Omega(n \lg n)$. Conclude that the solution is $\Theta(n \lg n)$. K6 (12)