Code No: 5405AA

**R17**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**M. Tech I Semester Examinations, July/August - 2021**
**ADVANCED ALGORITHMS**
**(Computer Science)**

Time: 3 Hours

Max. Marks: 75

**Answer any Five Questions**
**All Questions Carry Equal Marks**
- - -

1. Explain in detail the Strassen's algorithm for matrix multiplication with an example.
[15]

2.a) Solve the following recurrence relation by using masters theorem $T(n) = 8T\left(\frac{n}{2}\right) + n.$

b) Explain about the random analysis with an example. [8+7]

3. Explain how insertion and deletion operations are performed on a red-black tree with an example. [15]

4.a) Demonstrate what happens when we insert the keys 5; 28; 19; 15; 20; 33; 12; 17; 10 into a hash table with collisions resolved by chaining. Let the table have 9 slots, and let the hash function be h(k) = k mod 9.

b) Explain the properties of Red-Black trees. [10+5]

5. Explain the Matrix-chain multiplication problem by using dynamic programming. [15]

6. Explain about amortized analysis. [15]

7. Explain in detail about Ford-Fulkerson method for solving the maximum-flow problem.
[15]

8. Explain in detail about the Clique Problem. [15]

---ooOoo---