Institute of Business & Information Technology

University of the Punjab

Quaid-e-Azam Campus, Lahore

Sheet No. _____

Assignment 03

Fall Term 2020

Complexity with Recursion Tree

Code	IT-466	**Degree**	BBIT
Title	Analysis of Algorithm	**Batch**	F17-IT Specialization
Due Date:	Nov 13, 2020 before 1630hr	**Marks**	110

Instructions:

1. Do not forget to pray before starting to attempt the paper. Trust me it helps.
   Remember! SOMEONE is always with you (Be Relaxed), and HE is also watching you (Be Honest)
2. **Question Paper is SELF EXPLANATORY. Understanding the Question Paper is part of Solution.**
3. Nothing Beyond the Finish Line will be Evaluated. Back Side of Pages is Beyond Finish Line.
4. For Calculations etc. Use the back side of the pages.
5. Error in Question will be advantageous to Student.
6. Read the Questions carefully before attempting.
7. Solve your paper using Black/Blue Pen only.
8. Attempt All Questions in a Precise Fashion.
9. Switch Off your Cellular Phones.
10. Manage Your Time.

GOOD LUCK

Reg. No: _____ **Name:** _____

Class: IT Specialization **Date:** Sunday November 08, 2020

Section: _____ **Signature:** _____

Q 01.	Q 02.	Q 03.	Q 04.	Q 05.	Q 06.	Q 07.	Q 08.	Q 09.	Q 10.	Total
15	15	15	15	15						110

Assistant's Signature

Examiner's Signature

Do Not Open until YOU are Advised by the Invigilator.

Question No 01. **15**

Find the Time Complexity of the Algorithm with following time equation using Recursive Tree

$$\mathbf{T(n) = 2\ T\left(\frac{n}{2}\right) + n^2}$$

Question No 02. **15**

Find the Time Complexity of the Algorithm with following time equation using Recursive Tree

Find the Time and Space Complexity of the Algorithm with following time equation 10+5

$$\mathbf{T(n) = 16\ T\left(\frac{n}{4}\right) + n^2}$$

Question No 03. **15**

Find the Time Complexity of the Algorithm with following time equation using Recursive Tree

$$T(n) = 3\,T\left(\frac{n}{3}\right) + cn^3$$

Question No 04. **15**

Find the Time Complexity of the Algorithm with following time equation using Recursive Tree

$$T(n) = 5\,T\left(\frac{7n}{5}\right) + \frac{7}{n}$$

Question No 05. **15**

Find the Time Complexity of the Algorithm using Recursive Tree

10

```
void doit(int n){
    if (n==1)
        return 1;
    for (i=0; i<n; i++)
        x = x + i;
    doit(n/2);
    doit(n/2);
}
```

$$T(n) = \frac{7}{2}T\left(\frac{7n}{2}\right) + n^4(\log_7 n)^{-2}$$ **5**