NATIONAL INSTITUTE OF TECHNOLOGY GOA

Department of Computer Science and Engineering

B.Tech V Semester-Test-I, September 2020

Course Name: **Theory of Computation** Course Code: **CS203**

Note:

- Be legible. Strictly, keep the rough work separate from the space you write the answer.
- Unnecessary details attracts penalty.
- The question paper is of *one* page and is for **35 Marks**.

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1. Design a DFA to recognize all strings of $0's$ and $1's$ that contain exactly three $0's$.**(4)**

2. Design a DFA to accept all strings of $0's$ and $1's$ that contain the substring 0101.**(4)**

3. Design a DFA to accept all strings of $0's$ and $1's$ where every odd position is a 1. **(5)**

4. Design a DFA to accept all strings of $0's$ and $1's$ that don't contain the substring 011. **(4)**

5. Design a DFA to accept the following language. **(4)**

$$L = \{w | w \text{ is the empty string } \epsilon \text{ or ends in a } 0.\}$$

6. Design a DFA to accept the following language. **(4)**

$$L = \{w | w \text{ has length at least 3 and its third symbol is a } 0\}$$

7. Design a DFA to accept the following language. Note $\Sigma = \{a, b\}$. **(5)**

$$L = \{w | w \text{ is any string except } a \text{ and } b\}$$

8. Design a DFA to accept all strings of $0's$ and $1's$ that start with 0 and has odd length or start with 1 and has even length.**(5)**

**********All the Best**********