**Computer Science and Engineering Department**

**Thapar Institute of Engineering and Technology**

**Course Code: UCT301**

**Formal Languages and Automata Theory**

**Tutorial 4**

1. Write the left-linear and right-linear regular grammar over, such that string contains at least one***a*** or one***b***.
2. Write the left-linear and right-linear regular grammar over, containing substring***001*.**
3. Write a left-linear and right-linear regular grammar over, such that string contain at most three ***a’s****.*
4. Consider the NFA given by the following diagram:



Find the equivalent NFA without transitions.

1. Use Thompson’s construction to construct a NFA for the following regular expression

 and convert this NDFA into DFA by using subset construction and then minimize it.

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