Department of Computer Science Engineering, SVNIT, Surat.
B. TECH-II 4th -semester, 2021-22
Course: CS208 Automata and Formal Languages
Tutorial – 11
(Turing Machine)

1. Obtain a Turing machine to accept the language $L = \{w \mid w\epsilon(0+1)^*\}$ containing the substring 001.

2. Obtain a Turing machine to accept the language containing the string of $0's$ and $1's$ ending with 011.

3. Obtain the Turing machine M recognizes the language A = { 0^{2^n} | n ≥ 0 }.

4. Obtain a Turing machine to accept the language $L = \{0^n 1^n \mid n \geq 1\}$

5. Design a Turing Machine which takes two input words generated with the alphabet {0,1,2}, separated using the symbol {#}, and verifies whether they are the same. For instance, given the input b2101#2101b the Turing Machine would inform that both words are the same, where b represents empty cells in the tape.

6. Suppose we try to construct a Turing machine to solve a particular problem, but we are not successful. Does this mean that no Turing machine exists that can solve that problem? Explain and justify your answer.