

THEORY OF COMPUTATION

DEPARTMENT OF COMPUTER ENGINEERING

Subject : TOC

ASSIGNMENT NO – 05

Unit : V

THEORY QUESTION

1. Explain **Language acceptance by TM**.
2. Explain the **representation of TM**.
3. Differentiate between **FA and TM**.
4. Define TM. And Explain **recursively enumerable set**.
5. Explain the **power of Turing Machine** over Finite Automata.
6. Write a short note on **Halting Problem of Turing Machine**.
7. **Write short notes on**
 - 1) Non-deterministic TM
 - 2) Composite TM
 - 3) Halting problem of TM.
 - 4) Limitation of TM
8. **Write a short notes on** 1) Universal TM 2) Multi tape Turing Machine
9. **Write a short notes on** 1) Unsolvability problem 2) Application Turing Machine
10. What is **Turing Machine**. Give the formal definition of TM. Design a TM that replaces every occurrences of abb by baa
11. How can Turing Machine compare with computer.

TURING MACHINE PROBLEM

12. Obtain **TM** to accept language $L = \{ 0^n 1^n \mid n \geq 1 \}$
13. Design **TM** for the language $L = \{ 0^{2n} \}$ over $\Sigma = \{ 0, 1 \}$
14. Construct **TM** for – $L = \{ \text{All string with equal nos of a's and b's.} \}$
15. Construct a **TM** to compute $L = \{ a^n b^{2n} \mid n > 0 \}$ Write simulation for the string.
 - i) abb
 - ii) aabbbb

16. Construct a **Turing Machine** for the language $L = \{a^n b c^n \mid n \geq 1\}$
17. Construct a **Turing Machine** for the language $L = \{0^n 1^n 0^n \mid n \geq 1\}$
18. Design **TM** to accept the set L of all strings formed with 0 & 1 and having substring '000'
19. Construct a **Turing Machine** to accept the language

$$L = \{ a^n b^n a^n \mid n \geq 1 \}$$

20. Construct a Turing Machine which accepts **odd length palindrome** over the $\Sigma = \{a, b\}$
21. Design TM to recognize an **arbitrary string divisible by 4** for $\Sigma = \{0, 1, 2\}$
22. Construct a Turing Machine to accept **string with equal nos of 0's and 1's**.
- 23. Construct TM for 1's complement of binary number.**
- 24. Construct TM for 2's complement of binary number.**
25. Design a **TM** to accept language

$$L = \{ w / w (0 + 1)^* \} \text{ containing the substring } 001.$$

26. Construct a **TM** to accept language of even nos of 0's and 1's.
27. Design **TM** to add unary number .
28. Design a **TM** that multiplies two unary numbers over $\Sigma = \{1\}$.

Write simulation for the string 11 & 111

RE TO TURNING MACHINE

29. Construct a **Turing Machine** $R = (aba^*b)$
30. Construct a **Turing Machine** $R = (a + b)^* bb$
31. Construct a **Turing Machine** $L = a^* ba^* b$

***** **Best of Luck** *****