MODULE-5

Question Bank

1. Define a Turing Machine. Explain the working of a Turing Machine. (05M)
2. Design a TM to accept the language L={$a^n b^n c^n$: n>=1}.(10M)
3. Design a Turing Machine to accept the language L={ww^R : w ϵ {a,b}*}. Write its transition diagram. Also show the sequence of moves made by the TM for the string “aabbaa”. (14M)
4. Define Turing Machine. Explain with a diagram, the general structure of multi-tape turing machine, (06M)
5. Define a Turing Machine. Also, design a Turing Machine to accept the set of all palindrome over {0,1}*. Write transition diagram for the constructed TM and write the sequence of ID’s for the input string ‘1001’. (12M)
6. Explain multi-tape TM and Non-deterministic TM with neat block diagrams.
7. Design a TM to accept the language, L={$0^n 1^n$: n>=1}. Also show the IDs to accept the string ‘000111’. (12M)
8. Design a TM to accept the language, L={$0^n 1^n 2^n$: n>=1}. Also show the IDs to accept the string ‘001122’. (12M)
9. Explain in detail the decidable languages. (05M)
10. Explain the following: i) Non-deterministic TM. ii)Multi-tape TM. (10M)
11. Prove the complement of a recursively enumerable language is recursive. (05M)
12. Write a note on universal TM and show that it simulates a computer.
13. Define the following terms:
    i) Decidable problem
    ii) Undecidable problem
    iii) Recursive language
    iv) Recursively Enumerable language

14. Write short note on the following: (05M each)
    i) Halting problem of a TM
    ii) Variants of Turing Machine
    iii) Universal Turing Machine
    iv) Post correspondence problem.
    v) Programing techniques for TM