

Unit IV

No. of Printed Pages : 04

Roll No.

7. (a) Explain the relations between the classes.

5

- (b) Prove that If L is a recursive language, L is also recursive.

10

8. Explain chomsky hierarchies of grammar with suitable example.

15

18E4

B.Tech. EXAMINATION, 2024

(Fifth Semester)

(C Scheme) (Main & Re-appear)

(CSE)

CSE307C

**FORMAL LANGUAGES AND AUTOMATA
THEORY**

Time : 3 Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Obtain a DFA to accept strings of a's and b's having even number of a's and b's. **8**
- (b) Give Applications of Finite Automata. **7**
2. (a) Design a Moore machine to generate 1's complement of a given binary number. **8**
- (b) Explain the properties and limitations of FSM. **7**

Unit II

3. (a) Write Regular expression for the following $L = \{a^n b^m : m, n \text{ are even}\}$
 $L = \{a^n, b^m, : m \geq 2, n \geq 2\}$. **10**
- (b) Define context free and context sensitive grammar. **5**

4. (a) Is the following grammar ambiguous :

$$S \rightarrow aB \mid bA$$

$$A \rightarrow aS \mid bAA \mid a$$

$$B \rightarrow bS \mid aBB \mid b. \quad \mathbf{5}$$

- (b) Explain Myhill-Nerode Theorem with example. **10**

Unit III

5. (a) Construct a DPDA Accepting strings with number of a's is more than number of b's. **10**
- (b) Explain application of pushdown machine. **5**
6. (a) Design a Turing machine to accept a Palindrome. **10**
- (b) Explain Post's Correspondence Problem. **5**