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END SEMESTER EXAMINATION – AUGUST 2025
COMPUTER SCIENCE- II SEMESTER MCA
24MCA24 – THEORY OF COMPUTATION

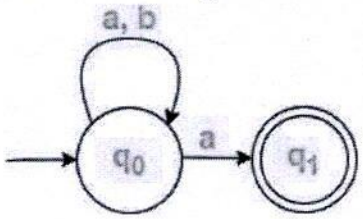
Time: 3 Hours **Max. Marks: 70**

Instruction: *Answer should be written completely in English.*

SECTION - A

Answer any **FIVE** questions. Each question carries **SIX** marks each. (5X6=30)

1. Find the equivalent DFA from the given NFA.



2. Draw a DFA to accept strings of a's and b's ending with abb.
3. Distinguish between DFA,NFA and ε-NFA.
4. Reduce the grammar in CNF(Chomsky Normal Form).

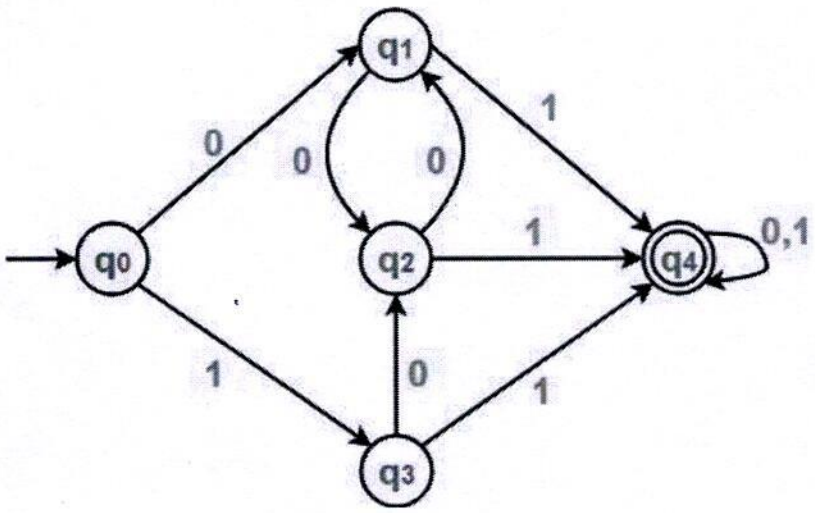
   S→bA | aB
   A→bAA | aS | a
   B→ aBB | bS | b

5. Construct the Regular Expression for the language consisting of the set of all strings of 0's and 1's beginning with 0 and ending with 1.
6. Explain the Moore machine with example.
7. Describe Chomsky's hierarchy of languages.
8. Describe the post correspondence problem.

SECTION - B

Answer any **FOUR** questions. Each question carries **TEN** marks each. (4X10=40)

9. Minimize the following DFA.



10. Draw a DFA to accept binary strings divisible by 5.

11. State and explain the Pumping Lemma for regular languages. Use it to prove that a given language is not regular. L={0^n1^n | n>=0}.

12. a. Eliminate all unit productions from the following grammar.

S->AB
A->D
D->a
B->F
F->b

b. Eliminate the useless symbols from the following grammar.

S->aS | A | G
A-> a
B->aa
C->aG

13. Obtain a PDA to accept the language L(M) = { a^nb^n | n>=1}.

14. Construct a Turing Machine to accept the language L={0^n1^n | n>=1}.