

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CSE) (Sem.-5)
FORMAL LANGUAGE AND AUTOMATA THEORY

Subject Code : BTCS-502-18

M.Code : 78321

Date of Examination : 24-11-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

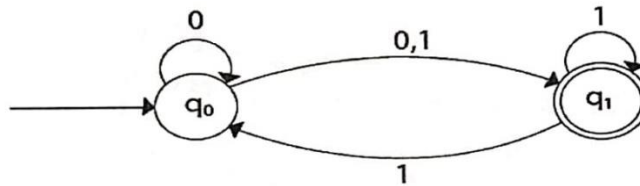
SECTION - A

1. Write briefly :

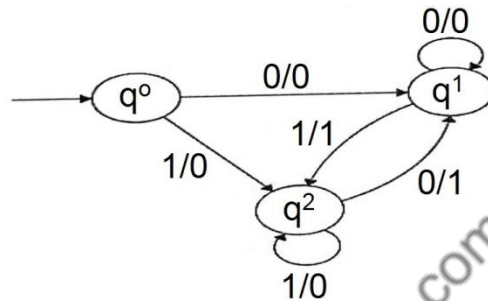
- a. Compare PDA with FA.
- b. State Kleene's theorem
- c. Discuss the importance of Arden's theorem
- d. What is a PDA? Discuss with example.
- e. Differentiate between type 1 and 2 grammar.
- f. What is ambiguity in context free grammar?
- g. Give any 2 uses of Automata theory.
- h. What is a formal language?
- i. What is left recursion?
- j. Give an example of production rule in automata.

SECTION - B

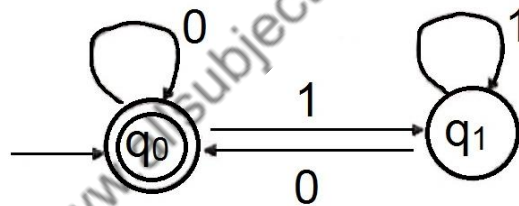
2. Convert this NFA to DFA :



3. Convert the given Mealy machine into Moore machine :



4. Check whether the given FA accepts the language set $L = \{0, 10, 110, 1100, \dots\}$. Also, discuss the importance of Language acceptance.



5. What are closure properties? Explain any four.
 6. What is the significance of pumping lemma for checking regular languages?

SECTION - C

7. Discuss in detail the hierarchy representing various types of Grammar, Languages and Machines.
 8. Differentiate between Moore and mealy machine and steps for conversion to each other.
 9. Discuss church Turing thesis in detail along with various types of TM.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.