

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2024

B.Tech-V Semester (CSE)

COURSE CODE (CREDITS): 18B11CI513 (03)

MAX. MARKS: 15

COURSE NAME: Formal Languages & Automata

COURSE INSTRUCTORS: ARV*, DHA, JTI, RMS

MAX. TIME: 1 Hour

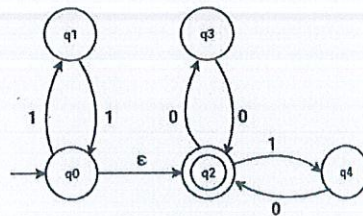
Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.

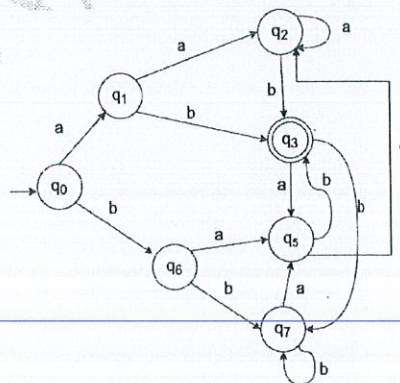
1. Convert the following ϵ -NFA to its equivalent DFA.

[CO-1][4 Marks]



2. Construct a minimal state automaton equivalent to a DFA whose transition diagram is defined by the figure below:

[CO-3][4 Marks]



3. Consider a simplified parking system where you need to create a deterministic finite automaton (DFA) to determine if a car can enter a parking lot based on its license plate. The parking lot only allows cars with license plates that start with the letter "A" and end with a digit (0-9). Design a DFA that accepts valid license plates and rejects invalid ones. Provide the states, the alphabet, and the transition functions.

[CO-2][3 Marks]

4. Design DFA for the following languages:

[CO-2][4 Marks]

(a) DFA that recognizes language of strings on $\Sigma = \{0, 1\}$ such that, if they are considered as binary representations of numbers, would accept numbers not divisible by 4.

Ex: DFA should accept strings like 10,11,101,110,111,1001... etc.

(b) DFA that recognizes language of strings on $\Sigma = \{0, 1\}$, which are ending in 1 and not containing 00.

Ex: DFA should accept strings like 1, 11, 01,101... etc.

JUIT TEST-1 EXAMINATION- Sep-2024