

TCS_TIT-403

454

Even Semester Examination - 2017

B.TECH. (IV SEMESTER)

THEORY OF AUTOMATA & FORMAL LANGUAGES

Time: 03:00 Hours

Max Marks : 100

Note: Attempt all questions.

Q1. Attempt any four parts of the following: (5X4=20)

- (a) Design FA to check whether decimal number is divisible by three. Inputs symbols are digit from 1 to 9.
- (b) What is Chomsky hierarchy of Grammar?
- (c) Explain the difference between Finite State Machine and Transition Graph.
- (d) Define Kleene Closure.
- (e) What is finite automata .Explain type of Finite automata with suitable example?

Q2. Attempt any four parts of the following: (5X4=20)

- (a) Explain the difference between Non deterministic finite state machine and Deterministic finite state

machine. Draw Transition diagram of each (one example).

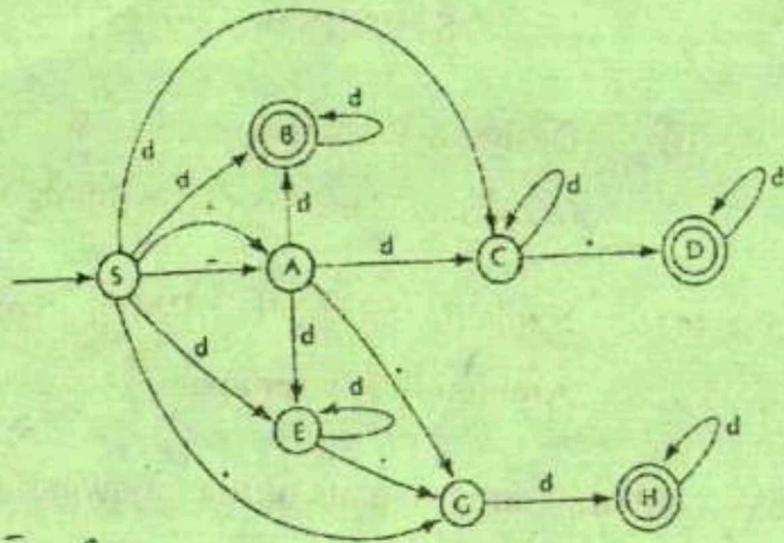
- (b) Convert the following Mealy machine to an equivalent Moore machine by the tabular format.

Present State	I/P=0		I/P=1	
	Next State	O/P	Next State	O/P
→Q0	Q0	1	Q1	0
Q1	Q3	1	Q3	1
Q2	Q1	1	Q2	1
Q3	Q2	0	Q0	1

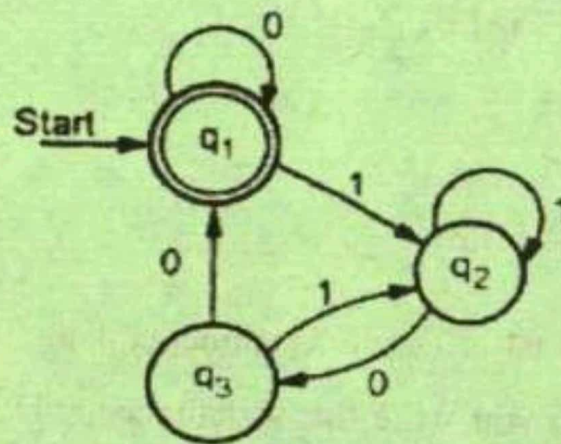
- (c) Draw a FA which accepts all inputs ending with 111 .(Input is given in 0 and 1)
- (d) Explain the Halting Problem of Turing Machine.
- (e) What is PDA .Explain the tuples of PDA.

Q3. Attempt any two parts of the following: (10X2=20)

- (a) Convert the following N DFA in to DFA. Inputs are {+, - , .., d}.



- (b) State and prove Arden's Theorem. Find out regular expression from given DFA.



- (c) Construct finite automaton to accept the regular expression $(0+1)^*(00+11)(0+1)^*$

Q4. Attempt any two parts of the following : (10X2=20)

- (a) Construct a PDA equivalent to the given grammar.

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- (d) Define Kleene Closure.
- (e) What is finite automata .Explain type of Finite automata with suitable example?

Q2. Attempt any four parts of the following: (5X4=20)

- (a) Explain the difference between Non deterministic finite state machine and Deterministic finite state