

CT#1

CSE-2205

Full Marks-20

Time 30 min

1. What is a finite automaton? How finite automata can be used for hardware and software design? Explain with example. 6
2. What is extended transition function? Design a finite automata that can accept any string of {a,b,1,0} that have a0b1 as a substring with transition table. 10
3. What are the differences between DFA and NFA? 4

CT#2

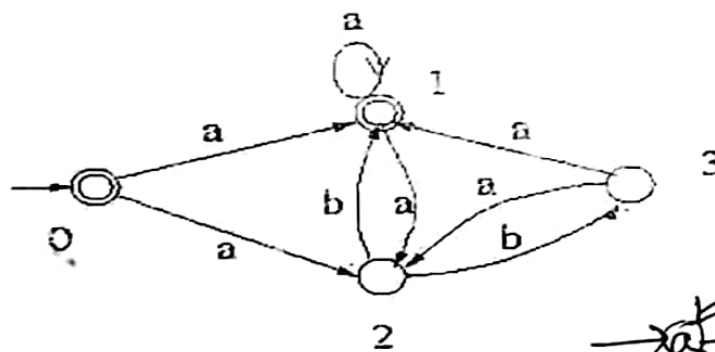
CSE-2205

Total-20

Time-25 mins

1. Convert the following NFA to DFA

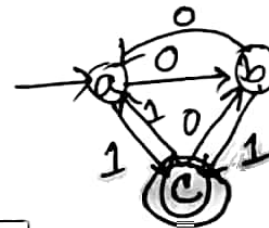
10



2. Give the regular expression for the following DFA

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	0	1
→ a	b	c
b	a	c
*c	b	a



CT#3

CSE-2205

Total-20

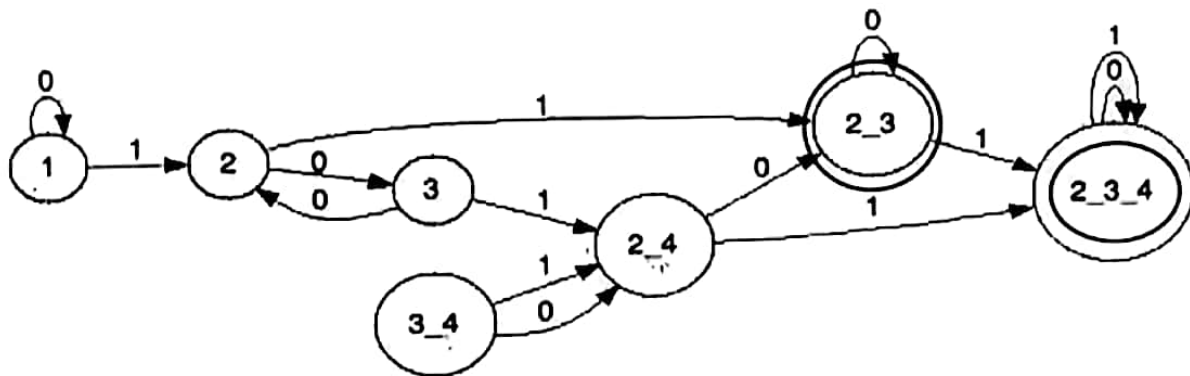
Time-25 mins

1. Convert the following regular expression to NFA: $01^*(1+0^*)^*01$

05

2. Test the equivalent of states of the following grammar using table filling algorithm

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3. Consider the following grammar. Give left most and right most derivation for the string $aabbccdd$. 05

$S \Rightarrow AB \mid C$; $A \Rightarrow aAb \mid ab$; $B \Rightarrow cBd \mid cd$; $C \Rightarrow aCd \mid aDd$; $D \Rightarrow bDc \mid bc$

CT#4	CSE-2205	Total-20	Time-25 mins
1. Determine whether this grammar is ambiguous or not for the string aab. If ambiguous then remove ambiguity: $S \rightarrow aS \mid aSbS \mid \epsilon$			07
2. Begin with the grammar: $S \rightarrow aAa \mid bBb \mid \epsilon$; $A \rightarrow C \mid a$; $B \rightarrow C \mid b$; $C \rightarrow CDE \mid \epsilon$; $D \rightarrow A \mid B \mid ab$			10
Eliminate (i) ϵ - production; (ii) unit production; (iii) useless symbol; Put the resulting grammar in CNF			
3. What is generating and reachable symbol? Explain with example.			03