P/S	O	1	x	y	b
q_1	xRq_2				bRq_5
q_2	ORq_2	yLq_3		yRq_2	
q_3	OLq_4		xRq_5	yLq_3	
q_4	OLq_4		xRq_1		
q_5				yRq_5	bRq_6
q_6					

(d) Write short note :

(i) Church's Hypothesis

(ii) Post Correspondence Problem

Unit-V

5. (a) What is non deterministic turning machine?

(b) Explain Turing Model for Computation?

(c) Explain space and Time Complexity?

(d) Explain the following :

(i) Recursive function

(ii) Partial Recursive function

(iii) Initial function

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B. E. (Fifth Semester) Examination, April-May 2019

(New Scheme)

(CSE Engg. Branch)

THEORY OF COMPUTATION

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

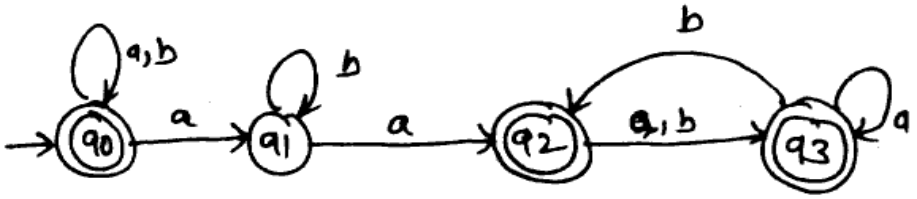
Note : *Part (a) is compulsory from each unit & carry equal 2 marks. Attempt any* ***two*** *parts of parts (b), (c) and (d) of questions are carries equal 7 marks.*

Unit-I

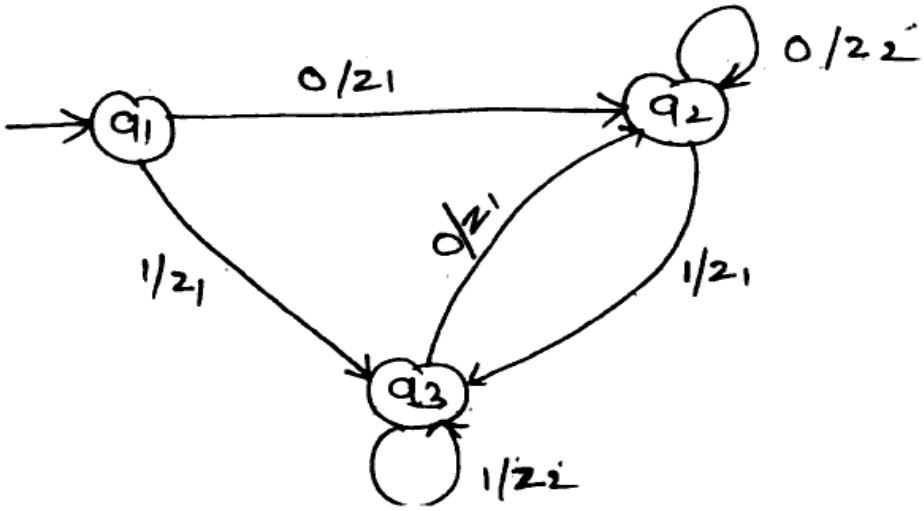
1. (a) What is Dump state in DFA?

(b) Write difference between DFA and NFA and also design a DFA to accept string of *a, b* ending with *ab* or *ba*.

(c) Convert the following NFA into DFA :



(d) Convert the given mealy machine to equivalent moore machine :



Unit-II

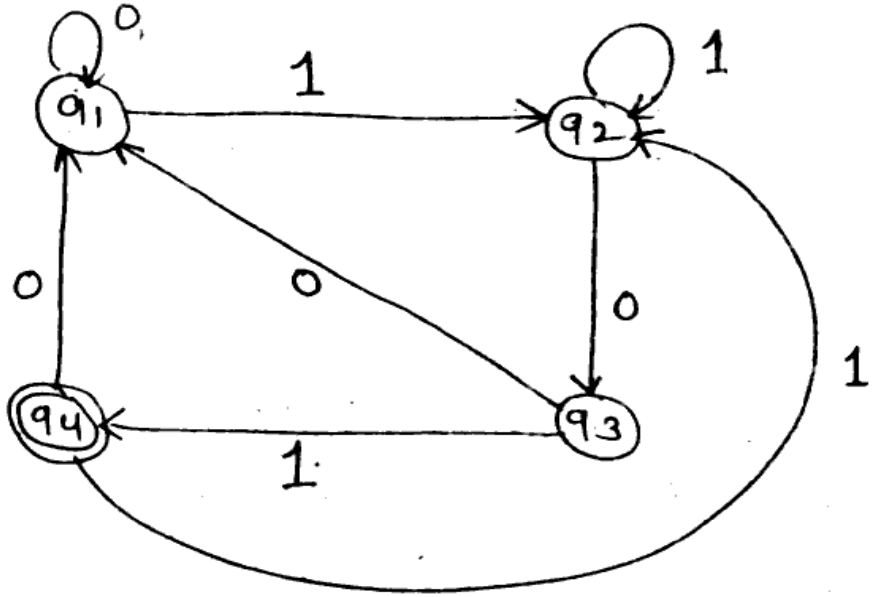
2. (a) What is the language accecpted by following Regular Expression :

$$R \cdot E = 0^{*}\left(1\left(01^{*}0\right)1\right)^{*}0^{*}0$$

(b) Convert the given Regular expression to minimised DFA :

$$R \cdot E = 10 + \left(0 + 11\right)0^{*}1$$

(c) Find the Regular Expression for the given transition system :



(d) Prove that $L = w \times w^R \Big/ \begin{matrix} w \in (0,1)^+ \\ |x| = 5 \end{matrix}$

is not Regular?

Unit-III

3. (a) $G = S \rightarrow AB$

$A \rightarrow aa / ab / ba / bb$

$B \rightarrow aBa / bBb / C$

$C \rightarrow aa / ab / ba / bb$

which of the following string is Generated by G?

(i) $b\ a\ b\ a\ b\ b\ a\ b$

(ii) $b\ a\ b\ a\ a$

(iii) $a\ b\ a\ a\ b$

(iv) $a\ a\ a\ b\ b\ b\ b\ a$

(b) Explain Chomsky hierarchy of grammar.

(c) Convert the given grammer into GNF ?

$E \rightarrow E + T / T$

$T \rightarrow T * F / F$

$F \rightarrow (E) \ / a$

(d) Show that following grammer is ambigous :

$S = S + S / S * S / id$

$W = id + id * id$

Unit-IV

4. (a) What is PDA?

(b) Design a PDA which accept $L = \{ a^n b^{2n} / n \geq 1 \}$.

(c) Consider the Turing Machine (TM) M describe by following transition table given below. Describe the processing of :

(i) 011

(ii) 0011

(iii) 001

using id's which of the above string are accepted by the (TM) M