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BTC/UCS-405 Roll No. .....

BACHELOR OF TECHNOLOGY (COMPUTER SCIENCE & ENGINEERING), BACHELOR OF TECHNOLOGY (COMPUTER SCIENCE & ENGINEERING) + MBA & BACHELOR OF TECHNOLOGY (COMPUTER SCIENCE & ENGINEERING) – EVENING

FOURTH SEMESTER END TERM EXAMINATION : APRIL, 2014

THEORY OF COMPUTATION

Time : 3 Hrs. *Maximum Marks : 70*

Note: ***Attempt questions from all sections as directed.***

SECTION – A (30 Marks)

Attempt any **5** *questions.*
Each question carries **6** *marks.*

1. Define Push Down Automata (PDA). Construct a PDA accepting $\{a^n\ b^{2n} \setminus n \geq 1\}$ by empty store.

2. Find L(G) generated by the grammar G :

$$\begin{pmatrix} S \rightarrow A/B \\ A \rightarrow aAb/aCb \\ C \rightarrow aC/a \\ B \rightarrow aBb/aDb \\ D \rightarrow bD/b \end{pmatrix}$$

P.T.O.

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3. What is undecidability ? Explain PCP and mod... PCP in detail.

4. Prove that L = {a^p : p is prime No.} is not regu...

5. Give DFA that accepts the language L((a+b)*b(a+b)...

6. Define Partial function. Prove that the functi... f(x, y) = max(x, y) is primitive recursive.

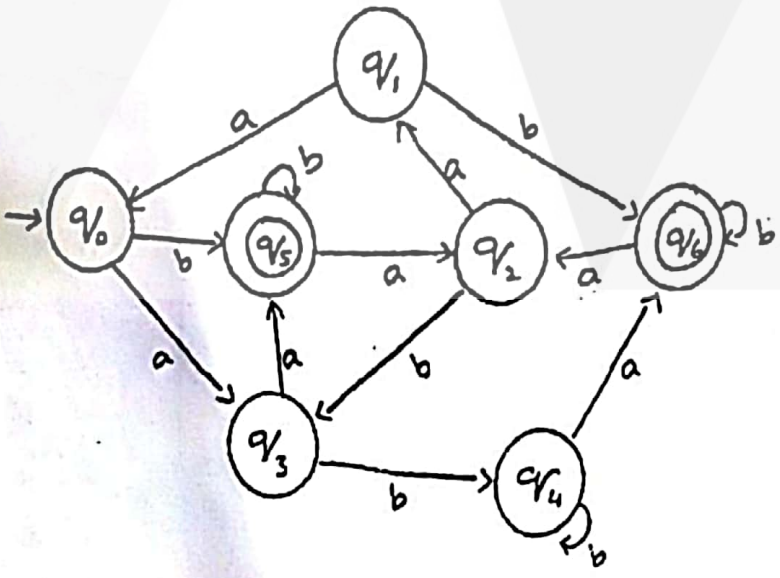
SECTION – B (20 Marks)

Attempt any **two** *questions.*

Each question carries **10** *marks.*

7. Explain the normal forms of CFG. Reduce Language $L = \{a^m b^n c^n d^m / m, n \geq 1\}$ into (i) Chomsky Normal form (CNF) (ii) Greibach Normal form (GNF).

8. (i) Minimize the Finite automation given below and show both given and reduced are equivalent.



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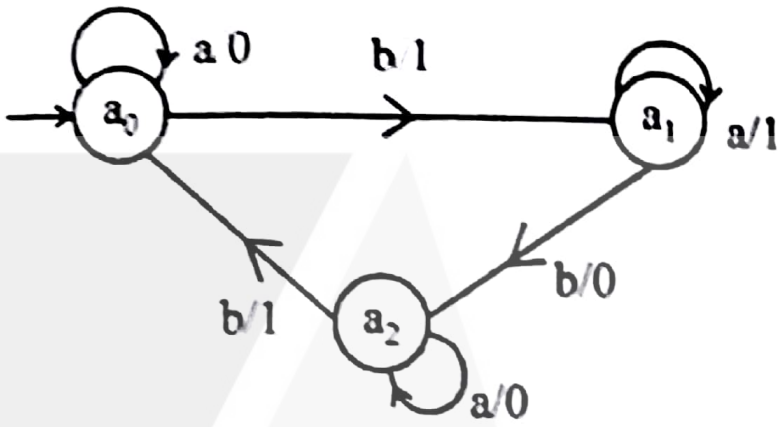
(ii) Convert the following Mealy Machine into Moore Machine.

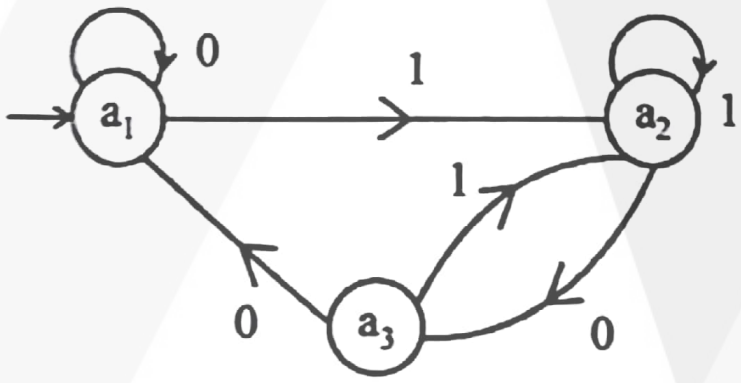


9. Define Turing Machine (TM). Design a TM for the Language $L = \{a^n b^n c^n / n \geq 1\}$. Show the computation sequence for w = aabbcc.

SECTION – C (20 Marks)

(Compulsory)

10. (a) Construct Regular Expression for the following Finite Automata :



(b) Explain Chomsky's hierarchy for formal Languages. Give production Rule and Language Accepted by each type of Language.

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(c) Differentiate between Recursive & Recursive Enumerable Language. Show that if L_1 and L_2 is Recursive then their Union $(L_1 \cup L_2)$ is also Recursive.

(d) Explain the following with an example

(i) Pumping Lemma for CFG

(ii) My-Hill-Nerode Theorem

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