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CSE204 Enrol. No. ....

[ET]

END SEMESTER EXAMINATION : APRIL–MAY, 2016

THEORY OF COMPUTATION

Time : 3 Hrs. *Maximum Marks : 70*

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

SECTION – A (30 Marks)

Attempt any five *questions out of* six.

Each question carries 06 *marks.*

1. Discuss an example of a language accepted by a PDA but not by DPDA.

2. Construct a regular expression defining each of the following languages over the alphabet $\Sigma = \{a, b\}$.

   (a) All words that end in double letter.

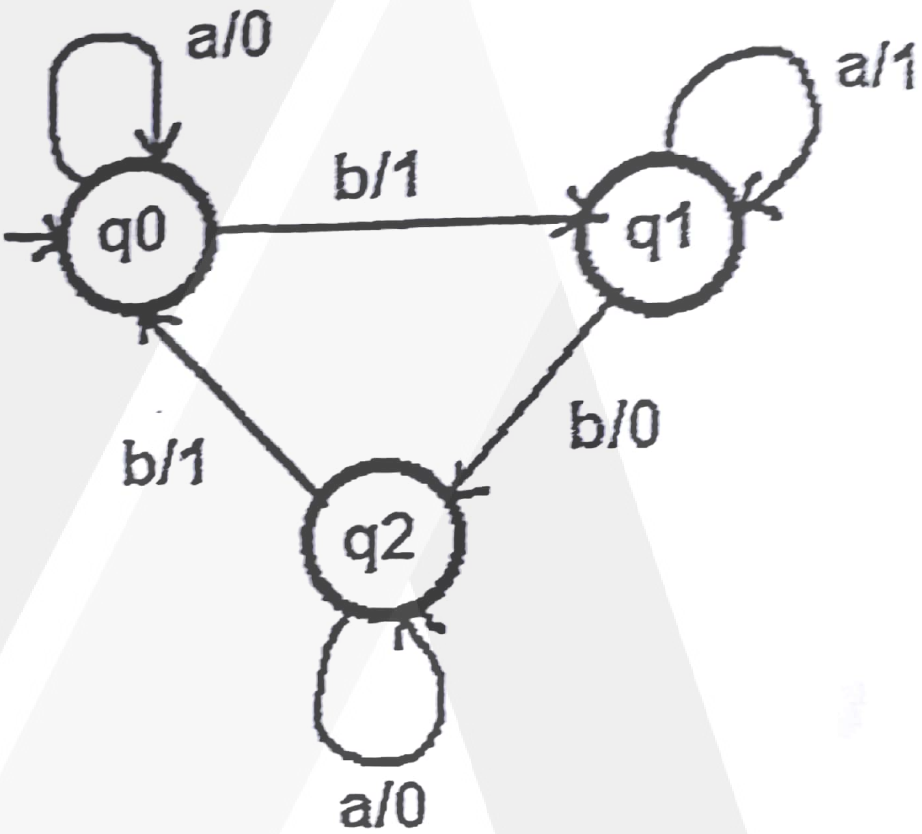
   (b) All words that do not end in double letter.

3. (a) Explain Chomsky hierarchy for formal languages.

P.T.O.

(b) Describe the working of Universal Turing Machine.

4. Convert the following Mealy machine in corresponding Moore machine.



5. Simplify the following grammar by eliminating useless symbols/productions and Unit production : 10

$S \rightarrow a \mid aA \mid Bb \mid cC$, $A \rightarrow aB$, $B \rightarrow a \mid Aa$, $C \rightarrow cCD$.
$D \rightarrow ddd$

6. Justify the following statement

'Recursively enumerable languages are closed under union operation.'

SECTION – B (20 Marks)

Attempt any **two** *questions out of* **three.**

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

7. Design a Turing Machine for set of all strings with equal number of 'a' and 'b'.

8. Design a Pushdown Automata for the language $L = \{a^n b^n \mid n > 0\}$.

9. Give the statement of Pumping Lemma for Regular languages and using it Prove or disprove that the language L given by $L = \{0^m 1^n \mid m \text{ and } n \geq 1\}$ is regular.

SECTION – C (20 Marks)

(Compulsory)

10. (a) Describe PCP and MPCP. Show that the post correspondence problem with two lists A = {11, 100, 111} and B = {11, 001, 11} has a solution and give the solution. (4)

(b) Describe halting problem of taring machine and also explain whether it is solvable or not. (4)

P.T.O.

(c) Design a TM to test a string of balanc[e]

parenthesis. Show an ID for ()(()). (

(d) Differentiate Partial function, Total functions a[nd]

Primitive recursive functions with example. (