University of Technology

Department of Computer Sciences

Final Examination2012-2011

Subject: computational theorem *class: second*

Division: A.I &sec *Time:3 hours*

Examiner: Alaa noori *date : - 5 - 2012*

Answer five Questions Only

Q1: A: let the G the grammar below: (10marks)

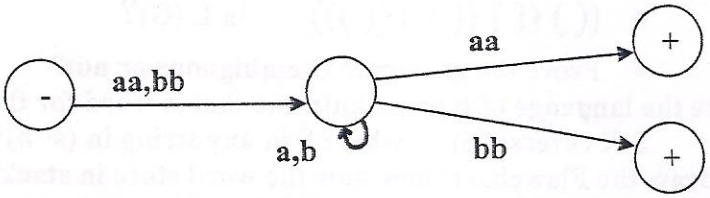
S ⟶ aAcBe

A ⟶ A b / b

B ⟶ d

Parse the word "abbcde" accept or not accept by using the button- up method?

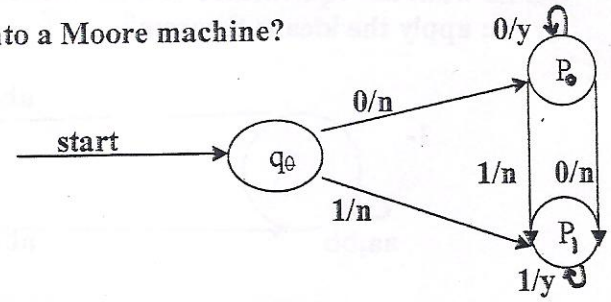
B: find the RE that define the same language acceptly follow TG by using Klean's Theorem?



Q2 A: How to represent Turing machine for this regular expression (10marks)

(a+b) b(a+b)*

B: Convert the mealy machine into a Moore machine?



Q3: A: Draw the finite automata from these production rules

1. S ⟶ aaS/ bbS / abX / baX / ^
   X ⟶ aaX/ bbX/ abS /baS (10marks)

2. S ⟶ aA/bB
   A ⟶ aS/a
   B ⟶ bS/b

3. S ⟶ aM/bS
   M ⟶ bS/aF
   F ⟶ aF/bF /^

4. S ⟶ aM / bS / ^
   M ⟶ bS/ aF/^
   F ⟶ aF/bF

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B: Define the following:

1- Terminal symbol 2- None terminal symbol

Q4: A: let the G = ({S}, { (,) } ,P ,S) (10marks)

Where P denoted as:

S ⟶ ( ) / (S) / SS

Is the string:

- (( ) (( ) (( ))) (( ))) in L (G)?
- Prove the grammar G ambiguous or not?

B: Write the language of type palindrome that is word for this equation

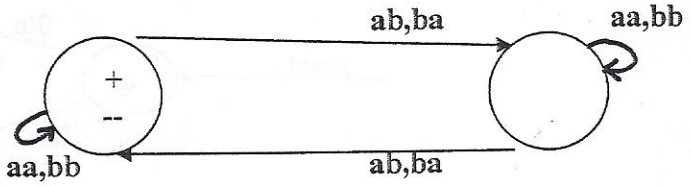
S X reverse (S) where S in any string in (a+b)*

And draw the Flowchart show how the word store in stack?

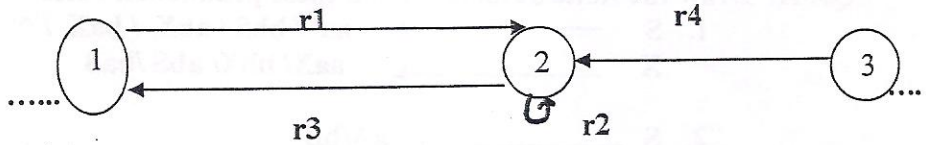
Q5: A: what the equivalence of moor and mealy machines? (10marks)

B: apply the kleans theorem?

1-



2-



Q6: A: convert the CFG into a CNF: (10marks)

S ⟶ aSa / bSb / Xa

X ⟶ ^ / b

B: How many start state for these following:

1- FA 2- TG 3- NFA

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GOOD LUCK