Ministry of Higher Education and
Scientific Research
University of Technology
Computer Sciences Department
final exam 2016-2017
second trail

Date:2017/9/
Time: 3 hours
Lecturer:Eman shaker

Subject:computation theory
Class:second
Branch: **CS, AI**

(Answer only six question)

Q1: (A) Write The CFG for The languageover the alphabet Σ={a,b} of all strings without the substring **bba**?

(B) Find the Regular Expression for the language of all string that have exactly three b?

Q2:(A) Draw a TG that accept the language ofall words with an odd number of string ab ?

Q2: (B)Find the regular expression for the following languages :--

1-{X,Y,XX,YY,XY,YX,XXX,YXX ,…} 2-{cb, cbba,cbbbaab,cbbbbabb,…..}

3- {baba, aabbaaab, bbbaaaa, abababababb….}.

Q2:(A) Draw a NFA that accept the language of all words with either a double **a** or a double **b** in them ?

Q4: Let FA1 accepts all words with a double **b** in them, and let FA2accepts all words ending in **a**. Build FA3that accepts all words ending in **a** and have double**b** in them using Kleen's theorem?

Q5: What are the language generated by the following grammars ,give an example of word accepted by this grammar?

(1) $S \rightarrow aM \mid bS$
$M \rightarrow aF \mid bS$
$F \rightarrow aF \mid bF \mid \Lambda$

(2) $S \rightarrow bA$
$S \rightarrow a$
$A \rightarrow a$
$A \rightarrow aS$
$A \rightarrow bAA$
$B \rightarrow b$
$B \rightarrow bS$

Q6:Draw a push down automata(PDA) that accept the language defined by this RE (a+b)aaa?

Q7:convert the following production rules into DFA ?

$S \rightarrow bA \mid aB$
$A \rightarrow aS \mid bB$
$B \rightarrow bS \mid b$