

National University of Computer and Emerging Sciences

(Islamabad Campus)

Department of Computer Science

Signature of Invigilator: _____

Serial No: _____

cs-301 Theory of Automata

Mid-I Examination (Fall 2012)

Instructor(s):

Dr. Waseem Shahzad, Mrs. Ramoza Ahsan, Ms Mehreen Alam

Oct 1, 2012

Total Marks: 60

Time Allowed: 1 hour

Instructions

- (1) Examination is closed books/notes. No notes, cheat sheets, textbook, or printed material allowed.
- (2) Make sure you have all the 4 Pages.
- (3) Answer only in the space provided. You may use the back side for rough work.
- (4) If you believe that some essential piece of information is missing, make an appropriate assumption and use it to solve the problem.
- (5) You have to return the complete booklet.
- (6) Write your name and roll number on each page.

Roll No: _____

Name: _____

Section: _____

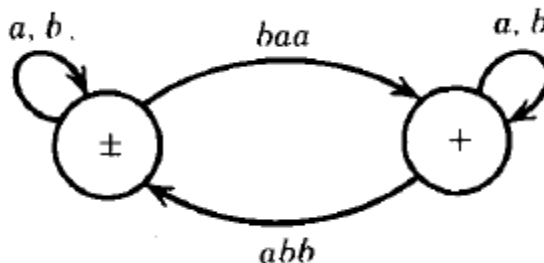
Question	1	2	3	4	5	6	Total
Points							
Score							

Vetted By: _____

Vetter Signature: _____

- Q1. [5+5 = 10pts] Give recursive definition of the following
- Language S^* where $S = \{aa, b\}$
 - Set POWERS-OF-TWO = $\{1, 2, 4, 8, 16, \dots\}$
- Q2. [2.5+2.5 = 5pts] Describe (in English phrases) the languages associated with the following regular expression.
- $(a+b)^* a$ (null word+bbbb)
 - $(b(bb)^*)^* (a(aa)^* b(bb)^*)^* (a(aa)^*)^*$
- Q3. [10pts] Write RE for the language consisting of words that DONOT contain even number of a's.
- Q4. [10pts] Design an FA for the language where every word has ODD a's and EVEN b's.
- Q5. [5pts] Design a TG for the language where no word contains the substring bba
- Q6. [10+10 = 20pts] Convert the following TGs to REs. Do show the necessary steps.

a.



b.

