The Open University of Sri Lanka
B.Sc. Degree Programme : Level 05
Open Book Test- 2007/2008
CSU 3275/PMU 3293 - Automata Theory.
Duration: **One and Half Hours.**

Date:13/03/2008 4.00pm – 5.30pm

Answer ALL Questions.

1.

i) Describe the following languages over an alphabet A = {a,b} in normal words.

a) L_1 = {a, ab, ab^2 .....}

b) L_2 = { $a^m b^n$: m>0, n>0}

c) L_3 = { $a^m b^m$: m>0}

d) L_4 = { $b^m a b^n$: m>0, n>0}

ii) Consider the DFA given by the following transition table, M(S0, I, δ, S4)

M	State Transition	
	a	**b**
S0	S4	S1
S1	S2	S1
S2	S4	S3
S3	S4	S3
S4	S4	S4

a) Draw the directed graph for the above table.
b) Show that δ^* (S0, aaa(bab)* b) = S3.
c) Check whether aaaba*baaa is a word accepted by M.

2. Construct a DFA that accepts words which contains the substring 'end' over the English alphabet(26 letters). (***hint***: *'send' is accepted*).

Draw the transition table for the above DFA and define the machine as M.

3. i) What do you mean by *implementation* of a machine?

ii) Implement the machine you constructed in **Question no. 2** using a suitable technique and define the new machine as M1.

iii) Obtain the complete truth table for the circuitry of the machine M1.