The Open University of Sri Lanka
Department of Mathematics and Computer Science
B. Sc. Degree Programme – Level 05
CSU3275/PMU3293 – Automata Theory
Open Book Test - (2009/2010)

Duration: **One and a half hours only**

Date : 18.03.2010 Time: 4.00 pm – 5.30 pm

Answer All Questions.

01. Provide two examples of strings belonging to, and not belonging to, the following language L over the alphabet $\Sigma = \{a, b\}$.

$$L = \{w \in \Sigma^* \mid www = uu \text{ for some } u \in \Sigma^*\}$$

02. Let L be the language over the alphabet $\{0, 1\}$ consisting of all the strings having alternating 0's and 1's. [**Note:** The minimum length of such a string is 2. The strings 10 and 01010 are in the language while 001 and 11 are not.]

Construct a deterministic finite automaton (DFA) accepting the language L. Test your DFA on the following input strings.

(i) 1010
(ii) 0100
(iii) 010

03. Consider the nondeterministic finite automaton (NFA) shown in Figure 1.

(a) Describe in words the language accepted by it.
(b) Check whether the following strings are accepted by it or not.
(i) a^*b
(ii) bb^*a

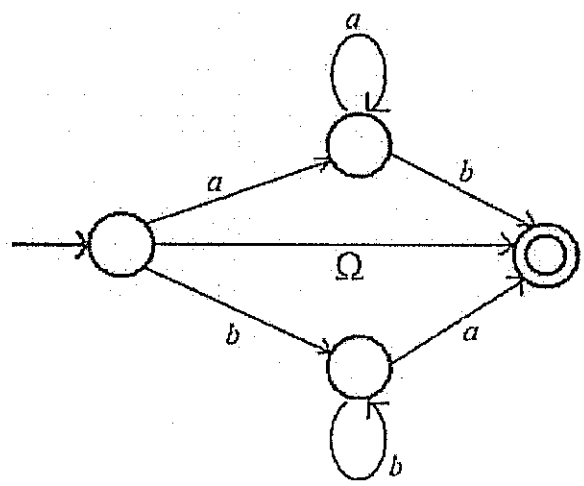

Figure 1