COMP 272 Theory of Computation
March 9, 2000, **Quiz 1**

Name: ____________________ E-mail: ____________________
Student No: ____________________ Tutorial: ____________________

You have 30 minutes to solve 3 problems for a total of 20 marks. Answer all problems in the space provided. You may also use the back of the test papers. Good luck!

1) (8 points)
For each statement below, circle the appropriate answer and give a short explanation of your answer in each case.

Note: You will receive no credit unless your explanation is correct.

(a) For every language L, $(\{e\} \cup L)^* = L^*$.

True False

Explanation:

(b) Suppose the DFA $(K, \Sigma, \delta, s, F)$ accepts the language L. Then $e \in L$ if and only if $s \in F$.

True False

Explanation:

(c) Let Σ be an alphabet. Σ^* is uncountable.

True False

Explanation:

(d) The set $2^{\mathcal{N}}$ is equinumerous with the set of all languages over $\Sigma = \{0, 1\}$.

True False

Explanation:

2) (4 points) Write a regular expression for the following language

$$\{w \in \{0,1\}^* : w \text{ does not end with } 01\}$$

3) (a) (4 points) Draw a DFA that accepts the language

$$\{w \in \{a, b\}^* : w \text{ does not contain } abb\}$$

(b) (4 points) Draw a DFA that accepts the language

$$\{w \in \{a, b\}^* : w \text{ does not contain } abb \text{ and does not contain } ba\}$$