

In The Name of God, The Compassionate, The Merciful

Name: .....

Student ID#: .....

**Statistical Pattern Recognition (CE-725)**  
**Department of Computer Engineering**  
**Quiz #4 - Spring 2010**

Consider the following 2-class classification problem involving a single feature  $x$ . Assume equal class priors.

$$p(x|w_1) = \begin{cases} 2x & 0 \leq x \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

$$p(x|w_2) = \begin{cases} 2-2x & 0 \leq x \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

**a. (4 points)** State the Bayes decision rule.

**b. (3 points)** What is the Bayes classification error (hint: sketch the densities and boundary)?

**c. (3 points)** How will the decision boundary change if the prior for class  $w_1$  is increased to 0.7?