

STA 4322/5328  
Quiz 1  
Spring 2011

Name: \_\_\_\_\_

All problems have exactly one correct answer.

*Problem 1* Consider an experiment which consists of tossing a coin with success probability  $p$  a 1000 times. If 800 tosses are reported to be heads, and 200 tosses are reported to be tails, the most obvious guess for  $p$  (as discussed in class) is given by

- (a) 0.8.
- (b) 0.2.
- (c) 0.9.
- (d) 0.3.

*Problem 2* Suppose  $\hat{\theta}$  is a statistical estimator of a parameter  $\theta$ . Then

- (a)  $MSE(\hat{\theta}) = \mathbf{E}[(\hat{\theta} - \theta)^2]$ .
- (b)  $MSE(\hat{\theta}) = \mathbf{E}|\hat{\theta} - \theta|$ .
- (c)  $MSE(\hat{\theta}) = \mathbf{E}[\hat{\theta}] - \theta$ .
- (d)  $MSE(\hat{\theta}) = \mathbf{E}[\hat{\theta}] - 1$ .

*Problem 3* A statistical estimator is a random variable. This statement is

- (a) True.
- (b) False.

*Problem 4* Let  $\hat{\theta}_1$  and  $\hat{\theta}_2$  be two different statistical estimators of the same parameter  $\theta$ . Then we say that  $\hat{\theta}_1$  is a better estimator of  $\theta$  than  $\hat{\theta}_2$  if

- (a)  $MSE(\hat{\theta}_1)$  is always larger than  $MSE(\hat{\theta}_2)$ .
- (b)  $MSE(\hat{\theta}_1)$  is always smaller than  $MSE(\hat{\theta}_2)$ .
- (c) Bias of  $\hat{\theta}_1$  is always larger than  $\hat{\theta}_2$ .
- (d) Bias of  $\hat{\theta}_1$  is always smaller than  $\hat{\theta}_2$ .

*Problem 5* If  $\hat{\theta}$  is an unbiased estimator of  $\theta$ , then  $MSE(\hat{\theta}) = V(\hat{\theta})$ . This statement is

- (a) True.
- (b) False.