251x0531 4/18/05

ECO251 QBA1
THIRD EXAM
Apr 25, 2005

Name: _____
Student Number: _____
Class Time (Circle) 1pm 2pm

Part I: 16 points.

Z follows the standardized Normal distribution $(z \sim N(0,1))$.

Find the following. **Make diagrams!**

1. $P(-2.63 \leq z \leq 2.63)$

2. $P(-3.11 \leq z \leq -2.63)$

3. $F(3.11) = P(z \leq 3.11)$

4. $z_{.115}$

x follows the Normal distribution $(x \sim N(2.63, 2))$.
Find the following. **Make diagrams!**

5. $P(-2.63 \leq x \leq 2.63)$

6. $P(-3.11 \leq x \leq -2.63)$

7. $F(3.11) = P(x \leq 3.11)$

8. $x_{.115}$

Part II: (15+ points) Do all the following: All questions are 2 points each except as marked. Exam is normed on 50 points including take-home. Most questions come from Wonnacott and Wonnacott (1990) (**Showing your work can give partial credit on some problems! In open-ended questions it is expected. Please indicate clearly what sections of the problem you are answering and what formulas you are using. Neatness counts!**) Remember that you may not be able to finish this section, so ration your time on each problem. [Numbers in brackets are a cumulative total]

1. If Y tends to decrease as X increases, what can we say about the population correlation ρ ?
   a) $\rho > 1$.
   b) $\rho < -1$.
   c) $\rho > 0$.
   d) $\rho < 0$.

2. The riskiness of a portfolio made up of two investments
   a) will be higher when the covariance is zero.
   b) will be higher when the covariance is negative.
   c) will be higher when the covariance is positive.
   d) does not depend on the covariance. [2]

3. Seventy items are randomly selected from a pilot production run of N items to check their quality. X is the number of defective items in the sample. The distribution of X can be considered approximately binomial if N is
   a) 15
   b) 15^2
   c) 400
   d) 1500
   e) All of the above
   f) None of the above.

4. There are 24 Million people living in California. Approximately 8 million are in Los Angeles. The Census Bureau takes a random sample of 200 people from the state. Let X be the number of people in the sample who live in Los Angeles, then X is most conveniently treated as having the
   a) Binomial distribution with $n = 24\ million$ and $p = 8/24$.
   b) Poisson distribution.
   c) Binomial distribution with $n = 200$ and $p = 8/24$.
   d) Hypergeometric distribution
   e) none of the above.

5. Let X represent the number of times a fair die (6 sides) comes up with a 1 on top when the die is cast 300 times. What is a) $E(x)$, b) $Var(x)$, c) $E(x^2)$ **Show your work!** (5) [11]

6. Assume that a fair 6-sided die is cast a large number of times. What is the chance that the first time it comes up with a 1 on top is in the first 10 throws? **Show your work!** (2)