Instructions: The exam consists of four questions. The maximum number of possible points is 25. All the paper you should need is provided. Here is a list of conditions that apply.

1. Show all work.
2. Probability tables are provided - you have every table needed to complete the exam (it is not necessary to know the pdf functions of these probability distributions).

You have until 12:45 to finish the exam.

1. (6.25 points) The following descriptive statistic table was prepared using the 1995 Current Population Survey (CPS). It examines the relationship between education and wages.

   Educ is the number of years of formal schooling. Income is annual adjusted gross income. The sample population consists of men working full time between the ages of 21 to 65.

Variable	Min	Max	Mean	Standard Deviation
Educ	3	22	13	2.45
Income	800	97,688	38,100	21,000

   r= 0.32391

   (a) Interpret the value r. What does it tell you with respect to the relationship between education and income? Is this relationship weak or strong?

   (b) Using the functions from Chapter 3, estimate a linear relationship between education (the value along the x axis) and income (the value along the y axis). To estimate this linear relationship, you must find the slope of the line and the intercept value.

   (c) A 26 year old man working full time does not have any formal education. According to your calculations, what is his estimate income?

   (d) For every year of formal education, how much does a male worker's income change?

2. (6.25 points) From a binomial experiment.
   n=100
   p=0.10

   (a) Calculate $\mathrm{P}(x = 4)$

   (b) Calculate $\mathrm{P}(7 \leq x \leq 9)$

3. (6.25 points) Prof. Jon, an economics professor from one of the twelve Big Ten schools prides himself on minimizing the transaction cost of any activity - for example, when it comes to selecting his morning choice of a shirt (S) and slacks (P), he makes a random selection. Because his efficient wife does laundry every evening, his choice in the morning consists of the same set of four shirts and four slacks.

   (a) How many simple events are in this story?

   Over the last year, Prof. Jon has kept track of the frequencies of his choices. Here is a table with these results.

	– Shirts (S) –				
– Slacks (P) –	White	Teal	Orange Camp Shirt	Stripe	Total
Black	0.0323	0.0500	0.0730	0.0947	0.2500
Blue	0.0625	0.0220	0.0355	0.0600	0.1800
Khaki	0.0613	0.0550	0.0670	0.0467	0.2300
Green	0.0439	0.1330	0.0492	0.1139	0.3400
Total	0.2000	0.2600	0.2247	0.3153	1.0000

   (b) What is the probability that the selection of the day will include the tasteful orange camp shirt?

   (c) What is the probability that the selection of the day will *not* include the tasteful green slacks?

   (d) What is the probability that the selection of the day will include the green slacks and orange camp shirt?

   (e) For the sake of the students who must attend his classes, what is the probability that Prof. Jon will select the Khaki slacks, given that he has selected the Teal Shirt?

4. (6.25 points) The law firm of Dewey, Cheatham and Howe is considering the addition of a small office in Houston. An office relocator prepared a data set of the rental prices that met the lawyers' criteria. The average price per square foot is \$17.00 with a standard deviation of \$4.75. The lawyers met and decided that they only want to consider those offices that make up the 39th percentile of the range of prices around the mean, that is $P(a < x < b) = 0.39$ with the chosen area being equidistant around the mean value of \$17.00. Find the lower and upper bounds of this area in terms of the value x (price per square foot).