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Math 210 *Exam 2* *Dr. Chandarana*

March 26, 2003

Name:

ID #:

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Discussion Section Time and Day:

Note: For full credit show all work and proper reasoning clearly. *There will be very little or no credit for answers given without showing an appropriate amount of work. Cross out or erase any material you do not want counted. Incorrect reasoning may count against you.* You may use a calculator but ***not a graphing calculator or a programmable calculator.***

There are six (6) pages (including this page) on this exam and an extra sheet for scratch work. Do not miss any pages by mistake. ***After finishing the exam, hand in your exam to your TA.***

Good Luck!

problem	*points*	*your score*
1	20	
2	20	
3	20	
4	20	
5	20	
total	100	

1. (*20 points*) Two fair dice, one red and one blue, are rolled and the numbers on the uppermost faces are noted. What is the probability that one of the dice shows 2 *given* that the sum of the two numbers is 7? *Describe the events clearly.*

2. (*20 points*) A box contains 4 red, 5 blue and 3 yellow balls. A ball is selected at random and its color is noted. If it is blue it is replaced; otherwise it is not. A second ball is selected and its color is noted.

(a) Find the probability that the second ball is red.

(b) Find the probability that the second ball is blue.

3. (*20 points*) An unfair coin with $\Pr[T]=\frac{2}{5}$ is flipped 7 times. What is the probability of getting at least two heads and at least one tail. *Do NOT simplify your answer.*

4. (*20 points*) You have 4 poetry books and 3 mathematics books. You select 3 books at random to study over vacation. Define a random variable S to be the number of poetry books minus the number of mathematics books selected. Find the values assumed by S and its probability density function.

5. (*20 points*) You make frequent business trips from Madison to Milwaukee (a distance of about 80 miles) and to Chicago (a distance of about 160 miles) by rental car. Rental company A charges \$25 per day plus 55 cents per mile, and rental company B charges \$45 per day plus 25 cents per mile.

(a) Write equations describing the cost (in dollars) of driving x miles in a day under each of these rates, and sketch the graphs of these equations.

(b) Calculate the number of miles at which both the companies will cost you the same.

(c) What company would you rent a car from for a one-way trip to Milwaukee? Explain why?

(d) What company would you rent a car from for a round trip to Chicago? Explain why?

Scratch Work