Finite Applications of Math
Math 312
Exam 2
Spring 1994

Name _____

Be clear and complete. Show all work. No calculators are allowed.

(9) 1. A university has three colleges: A & S, Engineering and Education. There are 8200 students enrolled in the college. 4100 students take a course in A & S. 3300 students take a course in Engineering. 2000 students take a course in Education. 1000 students take courses in A & S and Engineering. 900 students take courses in A & S and Education. 400 students take courses in Engineering and Education. How many students take courses in all three colleges?

(8) 2. How many 4-member committees can be chosen from a club with 20 members?

(8) 3. (a) How many 4-letter "words" can be made from a 10-letter alphabet if no repetitions are allowed?

(8) (b) How many 4-letter "words" can be made from a 10-letter alphabet if repetitions are allowed?

(8) (c) How many 4-letter "words" can be made using the letters of the word "misspellers"?

(8) 4. What is the probability that a card chosen at random from a deck of 52 cards is either a spade or a four?

(9) 5. An urn contains 4 red balls and 6 green balls. Two balls are chosen at random. What is the probability that both balls are red, given that one of the balls is red?

(8) 6. A club has 5 men and 8 women. There are 4 officers, only one of whom is a man. A club member is chosen at random. Decide whether or not the following two events are independent:

E: The member is a woman.

F: The member is an officer.

(8) 7. (a) A fair die is rolled seven times in a row. Find the probability that exactly four of the outcomes are a 2?

(9) (b) What is the probability that at most five outcomes are a 2?

8. There are two urns. Urn I has 2 red balls and 3 green balls. Urn II has 5 red balls and 4 green balls. First an urn is chosen at random and then a ball is chosen at random from the chosen urn.

(8) (a) Draw a probability tree for this two stage experiment.

(9) (b) Given that the ball chosen is red, what is the probability that it came from urn I?