

### Quiz #3E – Chapter 5

1. The probability that a student graduating from Michigan State University has student loans to pay off after graduation is 0.60. The probability that a student graduating from MSU has student loans to pay off after graduation AND is a male is 0.24. Find the probability that a randomly selected student from MSU is a male GIVEN that this student has student loans to pay off.

2. According to data from *Business Week (Jan 2005)*, 51% of employees have confidence in their senior management. Assume that the other 49% do not have confidence in their senior management. Further assume that these percentages are true for the current population of all employees. Two employees are selected at random and asked whether or not they have confidence in their senior management. Draw a tree diagram for this problem and find the probability that in this sample of 2 employees:

- (a) Both have confidence in their senior management
- (b) At most one has confidence in his or her senior management.

3. A university president has proposed that all students must take a course in ethics as a requirement for graduation. Three hundred faculty members and students from this university were asked about their opinion on this issue. The following table gives the responses of these faculty members and students

	<b>Favor</b>	<b>Oppose</b>	<b>Neutral</b>
<b>Faculty</b>	45	15	10
<b>Students</b>	90	110	30

Suppose that we randomly choose one person from this group of 300. Calculate the following probabilities:

- a. The person is a faculty member
- b. The person opposes the issue
- c. The person is a faculty member AND favors the issue
- d. The person is a student AND is neutral on the issue
- e. The person favors the issue GIVEN that they are a student
- f. The person is a faculty member GIVEN that they oppose the issue
- g. The person favors the issue OR is a student
- h. Are the events "Favor" and "Faculty" statistically independent? Why or why not?

4. A fair 6-sided die is tossed one time. Event A occurs if a perfect square is tossed (a number that is the square of number). Event B occurs if an odd number is tossed.

- a. What is the sample space S?
- b. What is  $P(A)$ ?
- c. What is  $P(B)$ ?
- d. What is the complement of A?
- e. What is the complement of B?
- f. What is the complement of S?
- g. List the elements of A AND B and determine  $P(A \text{ and } B)$  (i.e., intersection)
- h. List the elements of A OR B and determine  $P(A \text{ or } B)$  (i.e., union)
- i. What is  $P(A|B)$ ?
- j. Are the events A and B statistically independent? Why or why not?