

# MATH 264 STATISTICS for SOCIAL SCIENCES

## 2<sup>nd</sup> Midterm Examination

December 3, 2005

14:00-15:30

Surname : \_\_\_\_\_  
Name : \_\_\_\_\_  
ID # : \_\_\_\_\_  
Department : \_\_\_\_\_  
Section : \_\_\_\_\_  
Instructor : \_\_\_\_\_

- The exam consists of 5 questions of different weights.
- Please read the questions carefully and write your answers under the corresponding questions. Be neat.
- Show all your work. Correct answers without sufficient explanation might not get full credit.

*GOOD LUCK!*

Please do not write below this line.

---

Q1	Q2	Q3	Q4	Q5	TOTAL
					25

**Question 1.** At the terminal of a certain airline, records disclose that 10% of their flights arrive early, 10% arrive on time, 12% arrive somewhat late, and 8% arrive very late. Determine the probability that in six randomly selected flights, one will arrive early, three will arrive on time, two will be somewhat late, and none will be late.

---

**Answer 1.**

**Question 2.** Mark the following questions as "TRUE" or "FALSE":

- (a) (            ) Events that cannot happen together are called independent.
- (b) (            ) Any continuous random variable is a normal random variable.
- (c) (            ) The expected value of any random variable cannot be 0.

**Question 3.** Let  $X$  be a number of products a company demanded weekly. The table below gives a probability distribution of  $X$ .

$X$	0	1	2	3	4	5
$P$	0.1	0.2	0.3	0.2	0.1	0.1

- (a) Find the expected value of  $X$  ( i.e., find the expected demand);
- (b) Find the standard deviation of weekly demand;
- (c) Find the probability that the company will demand at most 3 products next week.

---

**Answer 3.**

**Question 4.** There are many different coffee makers on the market. Their average price is \$33 and the standard deviation is \$9. Assume that the price has a normal distribution.

- (a) What is the probability that a random customer will pay less than \$25 for a coffee maker?
- (b) What is the probability that a coffee maker costs between \$35 and \$45?
- (c) Find the probability that a coffee maker costs at least \$30.

---

**Answer 4.**

**Question 5.** Consider two boxes  $A$  and  $B$  filled with red and yellow balls. Box  $A$  has 7 red and 11 yellow balls. Box  $B$  has 5 red and 9 yellow balls. First you choose one of the two boxes. Box  $A$  has probability 0.3 to be chosen and box  $B$  has probability 0.7 to be chosen. Let us assume that you choose at random 5 balls out of the chosen box, without replacement.

- (a) What is the probability that you have picked 2 red and 3 yellow balls?
- (b) Given that you have picked 2 red and 3 yellow balls, what is the probability that you picked them from box  $B$ ?

---

**Answer 5.**