

Stat 1030 Business Statistics
Additional Final Exam Review Questions (Part I)

DIRECTIONS:

These practice questions are intended to show the *style* of the final exam and provide some review of Topics 1–7. They represent only a sampling of possible questions so actual final exam questions are likely to cover different content.

The exam format is multiple choice. Choose the single best answer.

Questions 1–3.

Per capita annual family income for an individual is defined as total annual income in the individual's family divided by the number of persons in the family. A well-known sociologist claimed that at least 5% of all residents of Santa Barbara County have per capita annual family incomes below the official poverty level of \$4200. The sociologist also made an identical claim for Ventura County.

The following table represents a classification of 3550 individuals according to their residence in three California counties on May 1, 2012 and according to whether or not their per capita annual family incomes exceed the poverty level. Suppose this information is available for analysis.

	Number of individuals below poverty level	Number of individuals above poverty level
Santa Barbara County	128	2282
Ventura County	49	987
Kern County	7	97

Consider the six steps of the Inference Process. Let **Step 1** be given by

Question: Are the sociologist's claims for Santa Barbara and Ventura counties correct on May 1, 2012?

1. Consider the following answers **A1**, **A2**, **A3**, **A4** to **Step 2**:

A1 *Population* = all individuals who reside in California on May 1, 2012.

A2 *Population* = all individuals who reside in either Santa Barbara County or in Ventura County on May 1, 2012.

A3 *Population 1* = all individuals who reside in Santa Barbara County on May 1, 2012.

Population 2 = all individuals who reside in Ventura County on May 1, 2012.

A4 *Population* = all individuals who reside in any of Santa Barbara or Ventura or Kern counties on May 1, 2012.

Which of the following is a true statement?

- (a) **A2** and **A3** are the only correct answers.
- (b) **A4** is the only correct answer.
- (c) **A3** is the only correct answer.
- (d) **A1**, **A2**, **A3**, and **A4** are all correct answers.
- (e) None of the answers is correct.

2. Consider the following answers **A1**, **A2**, **A3**, **A4** to **Step 3**:

A1 *Sample* = all individuals who reside in California on May 1, 2012.

A2 *Sample* = the individuals classified in the table and who reside in either Santa Barbara County or in Ventura County on May 1, 2012.

A3 *Sample 1* = the individuals classified in the table and who reside in Santa Barbara County on May 1, 2012.

Sample 2 = the individuals classified in the table and who reside in Ventura County on May 1, 2012.

Sample 3 = the individuals classified in the table and who reside in Kern County on May 1, 2012.

A4 *Sample* = the individuals classified in the table.

Which of the following is a true statement?

- (a) **A4** is the only potentially correct answer.
- (b) **A2** is the only potentially correct answer.
- (c) **A1**, **A2**, **A3**, and **A4** are all potentially correct answers.
- (d) **A3** and **A4** are the only potentially correct answers.
- (e) None of the answers is potentially correct.

3. What is the correct answer to **Step 6**?

- (a) The claim for Santa Barbara County appears to be true and the claim for Ventura County appears to be false.
- (b) The claim for all three counties appears to be true.
- (c) The claims for Santa Barbara and Kern counties appear to be true and the claim for Ventura County appears to be false.
- (d) The claim for Santa Barbara County appears to be false and the claim for Ventura County appears to be true.
- (e) It is possible to perform **Step 6** on about 95 out of every 100 samples.

Questions 4–7.

The times in seconds required to recover from a forced skid measured from a sample of eight driving trainees is shown below.

3.4 3.8 2.6 3.1 4.4 3.3 3.2 3.4

4. What is the best estimate of the typical recovery time for the population of all driving trainees?
 - (a) 3.80 seconds
 - (b) 3.40 seconds
 - (c) 3.45 seconds
 - (d) 3.30 seconds
 - (e) None of the answers is correct

5. What is the best estimate of the maximum recovery time required by the 25% of all driving trainees who recover most quickly (require the least time)?
 - (a) 4.4 seconds
 - (b) 3.1 seconds
 - (c) 3.8 seconds
 - (d) 3.2 seconds
 - (e) None of the answers is correct

6. What is the sample standard deviation s ?
 - (a) 1.277 seconds
 - (b) 3.4 seconds
 - (c) 0.526 seconds
 - (d) 0.277 seconds
 - (e) None of the answers is correct

7. If the histogram of recovery times for all driving trainees has a bell shape, what percentage of all trainees require between 2.874 and 3.926 seconds?
 - (a) Almost 100%
 - (b) Approximately 68%
 - (c) Approximately 50%
 - (d) Approximately 95%
 - (e) None of the above

Questions 8–10.

Suppose that 12% of all American Airlines flights depart more than 15 minutes late in 2013. If an individual travels on six randomly-selected flights in 2013,

8. What is the probability that four of the flights do not depart more than 15 minutes late?
 - (a) 0.9976
 - (b) 0.1295
 - (c) 0.0024
 - (d) 0.0144
 - (e) 0.0002

9. What is the expected number of flights which depart more than 15 minutes late?
 - (a) 0.72
 - (b) 5.28
 - (c) 0
 - (d) 4
 - (e) None of the answers is correct.

10. What is the standard deviation of the number of flights which depart more than 15 minutes late?
 - (a) 0.7960
 - (b) 0.12
 - (c) 0.72
 - (d) 5.28
 - (e) 0.6336

Questions 11–13.

Advertising researchers are always interested to know whether consumers find their advertisements believable, especially when the advertisements contain celebrity endorsements, hidden-camera interviews, or claims that the products are “new and improved.” The data in the following table represent a small portion of a study conducted by the Gallup organization. The table indicates the proportion of adults who find celebrity-endorsement ads believable, listed according to the adult’s level of educational achievement.

	Less Than High School	High School Graduate	Some College	College Graduate
Believable	0.32	0.32	0.24	0.21

Suppose that a single adult is randomly selected from among those listed in the survey.

11. If 24% of adults in the surveyed group are college graduates, what is the probability that the chosen adult will be a college graduate who does not believe the ad?
(a) 0.0576 (b) 0.1896 (c) 0.0504 (d) 0.1968 (e) None of the answers is correct

12. If the chosen adult has had some college, what is the probability that she does not believe the ad?
(a) 0.2400 (b) 0.0576 (c) 0.2111 (d) 0.1896 (e) None of the answers is correct

13. If 40% of adults in the surveyed group have never been to college, what is the probability that the chosen adult has not gone to college but believes the ad?
(a) 0.108 (b) 0.216 (c) 0.256 (d) 0.128 (e) None of the answers is correct

Questions 14–15.

In a recent survey of 1600 upscale households in five large metropolitan areas, 24% of men consider themselves the primary shoppers for their household's groceries and their own clothing. (Assume that each household contains one woman and one man.) Although the men in the survey are highly computer-literate (87% have home computers), only 22% of the men say that computerized shopping is satisfying.

14. Find a 90% confidence interval for the percentage of men who consider themselves the primary shoppers for their household's groceries and their own clothing.
- (a) (0.229, 0.251)
 - (b) (22.9, 25.1)
 - (c) (0.222, 0.258)
 - (d) (21.9, 26.1)
 - (e) (22.2, 25.8)
15. Find the 95% margin of error in estimating the proportion of men who find computerized shopping satisfying.
- (a) 0.017 (b) (0.229, 0.251) (c) 2.0 (d) 0.020 (e) 0.010

Questions 16–18.

Scientists from the U.S. Park Service capture baby Pelicans in the Florida Everglades, measure their heights, then release them back to the wild. Assume that Pelicans are captured independently.

Suppose that the height of baby Pelicans is normally distributed with a mean height of 12.3 inches and standard deviation of 1.75 inches.

16. What is the probability that one captured baby Pelican has height less than 10 inches?
(a) 0.4049 (b) 0.9049 (c) 1 (d) 0 (e) 0.0951
17. If two baby Pelicans are captured, what is the probability that both have heights less than 10 inches?
(a) 0.0090 (b) 0.1902 (c) 0 (d) 1 (e) 0.8098
18. If three baby Pelicans are captured, what is the probability that two of them have heights less than 10 inches?
(a) 0.0246 (b) 0.1902 (c) 3 (d) 0.0082 (e) 0.0090

Questions 19–21.

The 1990's was a remarkably profitable decade for investors in the U.S. stock market. Three samples of individual stocks traded during the calendar years 1993, 1995 and 1997, respectively, have been examined for the annual rate of return on investment for each stock. (This rate is defined as the percentage of profit relative to investment.) Assume that the annual rate of return is normally distributed in each of these three years.

Sample 1: 1993 stocks

- 14 stocks were examined.
- Sample mean annual rate of return = 6.2%
- Sample standard deviation of annual rates of return = 3.4%

Sample 2: 1995 stocks

- 42 stocks were examined.
- Sample mean annual rate of return = 9.1%
- Sample standard deviation of annual rates of return = 4.4%

Sample 3: 1997 stocks

Four stocks were examined. The annual rates of return on these stocks are

10.1% , 5.7% , 1.2% , 12.4%

19. Find a 95% confidence interval for the mean annual rate of return for all U.S. stocks traded during 1993.
- (a) (4.59, 7.81)%
 - (b) (4.24, 8.16)%
 - (c) (4.42, 7.98)%
 - (d) (4.71, 7.69)%
 - (e) (5.29, 7.11)%
20. Find a 95% confidence interval for the mean annual rate of return for all U.S. stocks traded during 1995.
- (a) (7.73, 10.47)%
 - (b) (7.35, 10.85)%
 - (c) (7.98, 10.22)%
 - (d) (7.77, 10.43)%
 - (e) (8.80, 9.40)%

21. Find a 95% confidence interval for the mean annual rate of return for all U.S. stocks traded during 1997.
- (a) (4.87, 9.83)%
 - (b) (-0.53, 15.23)%
 - (c) (3.28, 11.42)%
 - (d) (2.50, 12.20)%
 - (e) The answer cannot be determined on the basis of the given information.

Questions 22–25.

Consider the theory that a gambler who visits Las Vegas has an equal chance of either losing money or not losing money. Suppose that a random sample of 1200 such visitors shows that 700 or more lose money.

22. What type of random variable is measured in this problem?
(a) transcendental (b) continuous (c) binomial (d) uniform (e) normal
23. Find the approximate probability of the sample result, assuming that the theory is true.
(a) 0 (b) 0.58 (c) 1 (d) 0.2810 (e) 0.2190
24. What is the appropriate conclusion about the stated theory?
(a) It is not possible to make a conclusion about the theory.
(b) The theory cannot be rejected because there is a 28.10% chance of the sample result.
(c) There is a 0% chance of making a conclusion about the theory.
(d) The theory should be rejected because the sample result is virtually impossible if the theory is true.
(e) The theory should be accepted because the sample result is virtually impossible if the theory is true.
25. Suppose in particular that 726 visitors in the sample lose money. Derive a new theory based on the sample evidence.
(a) Approximately 58% of gamblers who visit Las Vegas lose money.
(b) Approximately 50% of gamblers who visit Las Vegas lose money.
(c) Almost all gamblers who visit Las Vegas lose money.
(d) Approximately 0% of gamblers who visit Las Vegas lose money.
(e) Approximately 60.5% of gamblers who visit Las Vegas lose money.

Question 26.

From past experience, an airline has found the luggage weight for an individual passenger on a trans-Atlantic flight to have a mean of 80 pounds and a standard deviation of 20 pounds. There are always 100 passengers on the flight. The pilot insists on loading an extra 500 gallons of fuel whenever the total luggage weight exceeds 8300 pounds.

26. On what percentage of flights will the pilot insist on loading extra fuel?

- (a) 93.32 (b) 6.68 (c) 44.04 (d) 5.32 (e) 0

Solution

1. a
2. b
3. a
4. e
5. b
6. c
7. b
8. b
9. a
10. a
11. b
12. e 0.76
13. d
14. e
15. d
16. e
17. a
18. a
19. b
20. a
21. b
22. c
23. a
24. d
25. e
26. b