

Sample Midterm I
Econ 3790: Business and Economics Statistics
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You are allowed to use **a standard size (8.5*11) cheat sheet** and a simple calculator. Please write all the answers with a **BALL-POINT PEN** or an **INK PEN**. If you have any questions during the exam, please raise your hand. **GOOD LUCK!!! I am sure you guys will do great.**

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question and write it in the space given next to the question number. Each multiple choice question is worth 1 point.

- _____ 1. In a questionnaire, respondents are asked to mark their gender as male or female. Gender is an example of the
 - a. ordinal scale
 - b. nominal scale
 - c. ratio scale
 - d. interval scale

- _____ 2. Data obtained from a nominal scale
 - a. must be alphabetic
 - b. can be either numeric or nonnumeric
 - c. must be numeric
 - d. must rank order the data

- _____ 3. In a post office, the mailboxes are numbered from 1 to 4,500. These numbers represent
 - a. qualitative data
 - b. quantitative data
 - c. either qualitative or quantitative data
 - d. since the numbers are sequential, the data is quantitative

- _____ 4. A tabular summary of a set of data showing the fraction of the total number of items in several classes is a
 - a. frequency distribution
 - b. relative frequency distribution
 - c. frequency
 - d. cumulative frequency distribution

- _____ 5. A tabular method that can be used to summarize the data on two variables simultaneously is called
 - a. simultaneous equations
 - b. crosstabulation
 - c. a histogram
 - d. an ogive

Exhibit 1-1

A survey of 800 college seniors resulted in the following crosstabulation regarding their undergraduate major and whether or not they plan to go to graduate school.

Graduate School	Undergraduate Major			Total
	Business	Engineering	Others	
Yes	70	84	126	280
No	182	208	130	520
Total	252	292	256	800

- ___ 6. Refer to Exhibit 1-1. What percentage of the students does not plan to go to graduate school?
- a. 280
 - b. 520
 - c. 65
 - d. 32
- ___ 7. Refer to Exhibit 1.1. What percentage of the students' undergraduate major is engineering?
- a. 292
 - b. 520
 - c. 65
 - d. 36.5
- ___ 8. Refer to Exhibit 1-1. Of those students who are majoring in business, what percentage plans to go to graduate school?
- a. 27.78
 - b. 8.75
 - c. 70
 - d. 72.22
- ___ 9. μ is an example of a
- a. population parameter
 - b. sample statistic
 - c. population variance
 - d. mode
- ___ 10. Which of the following is not a measure of central location?
- a. mean
 - b. median
 - c. variance
 - d. mode

Exhibit 1-2

The weights (in pounds) of a sample of 36 individuals were recorded and the following statistics were calculated.

mean = 160 range = 60
mode = 165 variance = 324
median = 170

- ___ 11. Refer to Exhibit 1-2. The coefficient of variation equals
- a. 0.1125%
 - b. 11.25%
 - c. 203.12%
 - d. 0.20312%
- ___ 12. Refer to Exhibit 1-2. The distribution of weights in the above sample is
- a. positively skewed
 - b. negatively skewed
 - c. symmetric
 - d. None of the above
- ___ 13. Refer to Exhibit 1-2. The 50th percentile is
- a. 160
 - b. 165

- c. 170
 - d. cannot be answered give the amount of information.
- ___ 14. Refer to Exhibit 1-2. What is the difference between the largest value and the smallest value of the data?
- a. 160
 - b. 60
 - c. 40
 - d. None of the above
- ___ 15. Refer to Exhibit 1-2. The standard deviation of the above data is
- a. 20
 - b. 18
 - c. 16
 - d. 14
- ___ 16. On a December day, the probability of snow is .30. The probability of a "cold" day is .50. The probability of snow and "cold" weather is .15. Are snow and "cold" weather independent events?
- a. only if given that it snowed
 - b. no
 - c. yes
 - d. only when they are also mutually exclusive
- ___ 17. Events A and B are mutually exclusive. Which of the following statements is also true?
- a. A and B are also independent.
 - b. $P(A \cup B) = P(A)P(B)$
 - c. $P(A \cup B) = P(A) + P(B)$
 - d. $P(A \cap B) = P(A) + P(B)$
- ___ 18. The sample space refers to
- a. any particular experimental outcome
 - b. the sample size minus one
 - c. the set of all possible experimental outcomes
 - d. an event
- ___ 19. Two events are mutually exclusive
- a. if their intersection is 1
 - b. if they have no sample points in common
 - c. if their intersection is 0.5
 - d. None of these alternatives is correct.
- ___ 20. A method of assigning probabilities based upon judgment is referred to as the
- a. relative method
 - b. probability method
 - c. classical method
 - d. subjective method
- ___ 21. The range of probability is
- a. any value larger than zero
 - b. any value between minus infinity to plus infinity
 - c. zero to one
 - d. any value between -1 to 1
- ___ 22. The multiplication law is potentially helpful when we are interested in computing the probability of
- a. mutually exclusive events
 - b. the intersection of two events
 - c. the union of two events
 - d. conditional events
- ___ 23. If A and B are independent events with $P(A) = 0.4$ and $P(B) = 0.6$, then $P(A \cap B) =$

- a. 0.76
 - b. 1.00
 - c. 0.24
 - d. 0.20
- _____ 24. If A and B are mutually exclusive events with $P(A) = 0.3$ and $P(B) = 0.5$, then $P(A \cap B) =$
- a. 0.30
 - b. 0.15
 - c. 0.00
 - d. 0.20
- _____ 25. An experiment consists of four outcomes with $P(E_1) = 0.2$, $P(E_2) = 0.3$, and $P(E_3) = 0.4$. The probability of outcome E_4 is
- a. 0.500
 - b. 0.024
 - c. 0.100
 - d. 0.900

Problem

26. The following data show the yearly salaries of football coaches at some state supported universities.

University	Salary (in \$1,000)
A	53
B	44
C	68
D	47
E	62
F	59
G	53
H	94

For the above **sample**, determine the following measures.

- a. The mean yearly salary
 - b. The standard deviation
 - c. The mode
 - d. The median
 - e. The 70th percentile. Please interpret your answer.
27. Assume you have applied for two scholarships, a Merit scholarship (M) and an Athletic scholarship (A) The probability that you receive an Athletic scholarship is 0.18. The probability of receiving both scholarships is 0.11. The probability of getting Merit scholarship or Athletic scholarship or both is 0.3.
- a. What is the probability that you will receive a Merit scholarship?
 - b. Are events A and M mutually exclusive? Why or why not? Explain.
 - c. Are the two events A, and M, independent? Explain, using probabilities.
28. A survey of a sample of business students resulted in the following information regarding the genders of the individuals and their selected major.

Selected Major

Gender	Management	Marketing	Others	Total
Male	40	10	30	80
Female	30	20	70	120
Total	70	30	100	200

- What is the probability of selecting an individual who is majoring in Marketing?
- What is the probability of selecting an individual who is majoring in Management, given that the person is female?
- Given that a person is male, what is the probability that he is majoring in Management?
- What is the probability of selecting a male individual?

Sample Midterm I Answer Section

MULTIPLE CHOICE

1. ANS: B
2. ANS: B
3. ANS: A
4. ANS: B
5. ANS: B
6. ANS: C
7. ANS: D
8. ANS: A
9. ANS: A
10. ANS: C
11. ANS: B
12. ANS: B
13. ANS: C
14. ANS: B
15. ANS: B
16. ANS: C
17. ANS: C
18. ANS: C
19. ANS: B
20. ANS: D
21. ANS: C
22. ANS: B
23. ANS: C
24. ANS: C
25. ANS: C

PROBLEM

26. ANS:
 - a. 60
 - b. 15.8
 - c. 53
 - d. 56
 - e. 62. 70% of the universities pay their football coaches yearly salaries less than or equal to \$62,000.
27. ANS:
 - a. 0.23
 - b. No, because $P(A \cap M) \neq 0$
 - c. No, because $P(A \cap M) \neq P(A) P(B)$

28. ANS:

- a. 0.15
- b. 0.25
- c. 0.50
- d. 0.40