

Simon Fraser University

Data & Decisions I: BUEC 232

IMPORTANT EXAMINATION INSTRUCTIONS

What to bring on the exam day?

- **Writing supplies:** Bring pencils, erasers and a sharpener.
- **Calculator:** Any standard scientific calculator. Programmable or graphic calculators are **NOT** permitted.
- **Wristwatch:** Bring a watch to keep track of the time.
- **Photo ID:** Your SFU student photo ID is required to write the exam. Students who do not bring their university issued photo ID will **NOT** be permitted to write the midterm exam.

Other Important Reminders:

- Before taking the exam, ensure you remove **ALL** personal belongings (bags, books, notes, electronic devices, food, etc.) on or around your seat. **DO NOT** bring any open beverages, such as coffee, pop etc. You may bring bottles with caps **ONLY**, such as bottled water. In previous exams, students have spilled either hot coffee or juice on themselves or their neighbours. Do not bring **ANY** food to the exam for consumption (unless you have a medical reason).
- **Seating arrangement:** Each student will sit in an assigned seat. Follow your exam supervisor/TA's instructions for seating.
- **Cell phones:** You are **NOT** permitted to have a cell phone or any other electronic communication device on your person in an examination room. Cell phones must be switched off.
- **Do NOT begin the exam until you are advised to do so. This includes writing your name, student number, etc.** Once I allow you to begin writing, the very first thing you should do is enter your information on the scantron sheet and the exam paper.
- **Timing:** It is important that you arrive on time to take your exam. If you come late, no extra make up time will be given.
- **Sign the exam submission sheet upon completion of exam:** Once the exam is completed, you must submit the Scantron answer sheet and the exam booklet to your assigned TA. Show your student ID to your TA when handing in the exam. None of the exam material should leave the classroom, otherwise your exam will be considered incomplete and you will receive zero marks.
- Do **NOT** detach pages from the exam booklet.
- Please note that there will be **NO make-up exam**. It is your responsibility to ensure you are available and prepared to write the exam on the date it is scheduled. Missing the exam will result in **zero** marks.
- You are not permitted to talk to or help fellow students during the exam. If you have any questions, ask your instructor or teaching assistants. Academic dishonesty is a very serious matter. During the exam, using unauthorized material, helping fellow students or copying someone else's work will automatically give you zero marks in the exam, plus other university penalties. For more details regarding this matter, please refer to SFU's Code of Academic Honesty at <http://www.sfu.ca/policies/Students/index.html>.

Sample Midterm Exam

The following are some sample midterm questions. They are not actual exam questions, nor do they represent the full scope of the course material covered. To do well in the exam, it is strongly recommended that you study the material discussed in the class lectures and assignments.

Multiple-Choice: Answer the following questions on the Scantron answer sheet provided by marking the appropriate bubble using a pencil. Each question has only one correct answer. Please erase any incorrect answers completely. Since there is no penalty for guessing incorrectly, you should not leave any question blank. The exam will consist of **40** multiple-choice questions.

1. A financial analyst took a random sample of P/E Ratio of six retailers. The data are as follows:

Retailers	Price Earnings Ratio
Wal-Mart (WMT)	42.4
Canadian-Tire (CTR)	18.6
Sears (SCC)	24.3
Hudson Bay (HBC)	18.1
Loblaw (L)	28.4
Sobeys (SBY)	18.0

(data is hypothetical)

What is the arithmetic mean of the above P/E Ratios?

- A) 25.0
- B) 90.5
- C) 9.5
- D) 21.5
- E) 20.0

2. Professional basketball teams carry 12 players, and 5 players are on the court at any one time. How many different combinations of players can a team put on the court, assuming that each player can play any position?

- A) 792
- B) 790
- C) 892
- D) 890
- E) 795

3. Which of the following is a measure used to compare the relative variability of 2 data sets?

- A) The correlation coefficient
- B) The coefficient of determination
- C) The coefficient of variation
- D) The regression coefficient
- E) Chebyshev Rule

4. Which of the following is a measure of central tendency?
- A) Variance
 - B) Correlation
 - C) Mode
 - D) Regression
 - E) Standard Deviation
5. What is the correct term for the following statement: The means of samples from any shaped population will have a distribution that approaches the normal shape as the size of the sample used to calculate the mean increases?
- A) The binomial distribution
 - B) The central limit theorem
 - C) The finite population correction factor
 - D) The multiple linear regression model
 - E) Basic probability
6. A box contains 1000 balls, of which 2 are black and the rest are white. Which of the following is most likely to occur in 1000 draws with replacement from the box?
- A) Fewer than 2 black balls
 - B) Exactly 2 black balls
 - C) More than 2 black balls
 - D) Don't know
 - E) None of the Above
7. The standard error of the mean for a sample of 100 is 30. In order to cut the standard error of the mean to 15, we would
- A) Increase the sample size to 200
 - B) increase the confidence level
 - C) increase the sample size to 400
 - D) decrease the sample to 50k
 - E) Increase the sample size to 100
8. A normally distributed population has a mean of 50. The population standard deviation is 10. In a sample of 64 items, what is the probability of getting a sample mean in excess of 53?
- A) 0.0082
 - B) 0.3707
 - C) 0.6293
 - D) 0.9918
 - E) 0.5000
9. If you had a survey where respondents answered on a scale from 0-5, would this be an interval or a ratio scale?
- A) Interval scale
 - B) It depends on what a score of 0 means
 - C) Ratio scale
 - D) Neither an interval nor ratio scale
 - E) Ordinal scale
10. Which table, chart, diagram or plot would you use to depict categorical data for two variables in a visual format?
- A) A side-by-side bar chart
 - B) A contingency table
 - C) A pie chart
 - D) A scatter plot/diagram
 - E) Boxplot

11. How does the geometric mean differ from the arithmetic mean?
- The arithmetic mean and geometric mean are two names for the same measure.
 - The arithmetic mean is an average value over time while the geometric mean is an average value of a static data set.
 - The arithmetic mean is an average value of a static data set while the geometric mean is an average value over time.
 - An arithmetic mean is the square root of a geometric mean.
 - None of the Above
12. You observe 1000 leaves falling from a tree and record whether they land with their top or bottom showing and find that 632 or 63.2% land with their bottom showing. What approach to probability does this represent?
- This is just a math problem, not an example of probability.
 - This is an example of "subjective probability".
 - This is an example of "a priori classical probability".
 - This is an example of "empirical classical probability".
 - None of the Above
13. If $n=6$ and $p=0.33$, how is the probability $P(X=4) = 0.08$ calculated?
- $4!/(4!(6-4)!) \times 0.33^4 \times (1-0.33)^{6-4}$
 - $6!/(4!(6-4)!) \times 0.33^4 \times (1-0.33)^{6-4}$
 - $6!/(6!(6-4)!) \times 0.33^4 \times (1-0.33)^{6-4}$
 - $6!/(4!(6-4)!) \times 0.33^6 \times (1-0.33)^{6-4}$
 - $4!/(4!(4-6)!) \times 0.33^4 \times (1-0.33)^{4-6}$
14. Suppose that customers arrive at a bank's ATM at the rate of 20 per hour. If a customer has just arrived, what is the probability that the next customer will arrive within 6 minutes?
- 0.1353
 - 0.3679
 - 0.5000
 - 0.7468
 - 0.8647
15. Which of the following examples represents sampling without replacement?
- Measuring the length of 10 turtles in a pond, selected at random each month by picking them up, measuring them and putting them back in the pond.
 - Writing down the number of each color of leaves in an area 10 feet around one tree in the fall each day over a week's time, taking the red ones home for your leaf collection each day.
 - Throwing the same 10 pieces silverware on a table many times and counting how many land upright.
 - Measuring the temperature of 10 hamburgers at a fast food restaurant each day as soon as you receive them, then eating one for lunch and giving the rest to your friends.
 - None of the Above

Correct Answer

- 1: A
- 2: A. Number of combinations = $12!/5!7! = 792$
- 3: C
- 4: C
- 5: B
- 6: A. Fewer than 2 black balls is most likely. (The Poisson distribution)
- 7: C. Increase the sample size to 400
- 8: A. $P(z > 2.4) = 0.0082$
- 9: B. It depends on what a score of 0 means. If a "0" response can be considered a true zero point then this is an interval scale, else it is a ratio scale.
- 10: A. A side-by-side bar chart is used to depict categorical data for two variables in a visual format.
- 11: C
- 12: D. In this question the analyst is observing the occurrence of an event over many trials so it is an example of empirical classical probability.
- 13: B. Binomial Distribution
- 14: E. $1 - e^{-20(0.1)} = 1 - e^{-2} = 1 - 0.1353 = 0.8647$
- 15: B