UNIVERSITY AT ALBANY
STATE UNIVERSITY OF NEW YORK

AMAT 108 Elementary Statistics
Spring 2025

Exam 1
Version 1

Print Name:	
UAlbany Email:	
Instructor Name:	
Meeting Time:	

Directions: You have **80 minutes** to answer the following questions. ***No notes, textbooks, mobile phones or other aids are allowed. Only scientific calculators are allowed.***

For all multiple-choice questions, select **one** answer from among the choices given. No explanation is required to be shown and no partial credit will be given. Make sure to **completely** fill in the circle corresponding to your chosen answer.

For all free-response questions, you **must** show all necessary work to receive full credit. An answer with no work, even if correct, will not receive full credit. Please circle or box your final answer. All work, if needed, is to be rounded to ***five*** decimal places.

Do not detach any pages. Please completely fill in the items above with your name and section information.

Exam Scoring:

Page	Possible Points	Points Earned
3	3	
4	4	
5	3	
6	9	
7	12	
8	19	
Total Points	50	
Percentage		

1. Mr. Hulbert selects US states at random and asked a random sample of individuals working in each state if they have a wireless mouse. Identify the sampling method he uses. (1 pt.)

   ① Simple random sampling

   ② Stratified random sampling

   ③ Cluster sampling

   ④ None of the previous options

2. Which of the following options contains bias in sampling? (1 pt.)

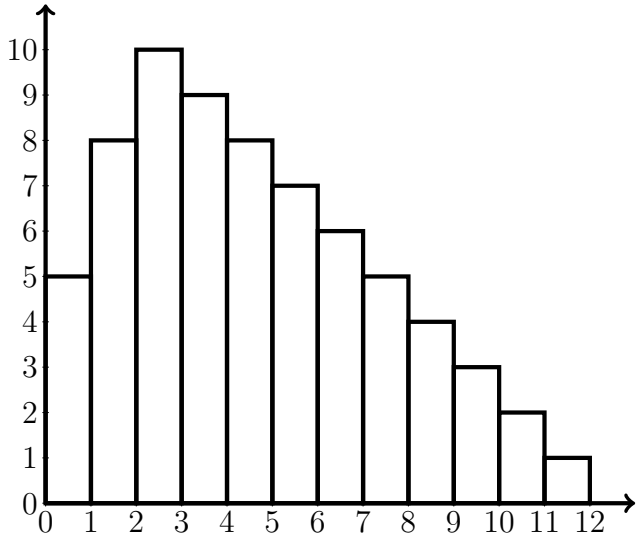
   ① Professor Habib selected Expo markers at random to study their lifespan.

   ② Dr. Spellman finds that 75% of people he selected for a telephone survey answered the phone.

   ③ Both of the previous options contain bias in sampling.

   ④ None of the previous options contains bias in sampling.

3. Mr. Rosenberg is analyzing the amount of time (in seconds) it takes the AMAT 108 course exam server to professionally craft exams. The histogram below is of the data he collects.



   Which of the following describes the shape of the histogram? (1 pt.)

   ① Unimodal and negatively skewed (skewed to the left)

   ② Bimodal and symmetric

   ③ Unimodal and symmetric

   ④ Unimodal and positively skewed (skewed to the right)

   ⑤ None of the previous options.

Questions 4-7 are based on the following. Dr. Wittig is recording information from a survey of randomly selected UAlbany undergraduate students. Choose the option that describes each variable.

4. Number of credit hours taken in the Spring 2025 semester (1 pt.)

① Discrete Numerical/Quantitative
② Categorical/Qualitative
③ Continuous Numerical/Quantitative
④ None of the previous options

5. Resident/commuter student status (whether the student is a resident student or a commuter student) (1 pt.)

① Discrete Numerical/Quantitative
② Categorical/Qualitative
③ Continuous Numerical/Quantitative
④ None of the previous options

6. Wait time (in minutes) in line to purchase textbooks (1 pt.)

① Discrete Numerical/Quantitative
② Categorical/Qualitative
③ Continuous Numerical/Quantitative
④ None of the previous options

7. Total distance walked on campus in a given week (1 pt.)

① Discrete Numerical/Quantitative
② Categorical/Qualitative
③ Continuous Numerical/Quantitative
④ None of the previous options

Questions 8-10 are based on the following. Mr. Lam randomly surveys 63 of his students. The survey finds that 47 of them are studying biology.

8. What is the sample of the survey? (1 pt.)

① All of Mr. Lam's students

② All biology majors

③ The 63 students

④ All students

⑤ None of the previous options.

9. What is the population of interest? (1 pt.)

① All of Mr. Lam's students

② All biology majors

③ The 63 students

④ All students

⑤ None of the previous options.

10. Based on the survey, find the relative frequency of Mr. Lam's students who said they are studying biology, correct to three decimal places. (1 pt.)

① 0.254

② 1.340

③ 0.746

④ 3.937

⑤ None of the previous options.

11. As part of an experiment he is conducting, Mr. Young selects several I-beams and measures their tensile strength. The observations are below:

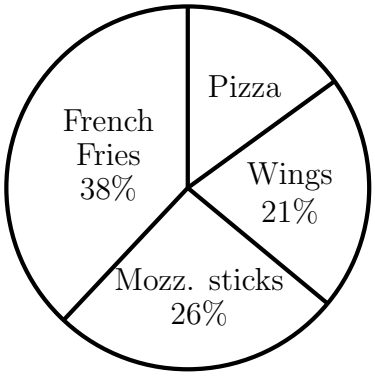
74	78	76	82	79

(a) **Fill in the blank.** The data set has $n =$____ observations. (1 pt.)

(b) Compute the sample mean. Do *not* round your answer. (3 pts.)

(c) Compute the sample standard deviation. Round your answer to *three* decimal places. (5 pts.)

12. Mr. Lamatina likes to watch movies at home. However, he is indecisive about what snack to eat while watching his movies. Looking online, he finds the results of a survey of 18925 people organized in the pie chart below.



(a) What is the percentage of those who said pizza was their favorite snack while watching movies? (2 pts.)

(b) How many of the surveyed individuals said their favorite snack to eat while watching movies is mozzarella sticks? Round your answer to the nearest whole number, where needed. (2 pts.)

13. Assume that the lifespan of a certain brand of space heater is roughly unimodal and symmetric (a normal curve) with mean 8673 days and standard deviation 1092 days.

(a) What interval of lifespans of these space heater represents the central 95% of all lifespans? (2 pts.)

(b) Approximately what percentage of these space heaters would last between 5397 and 10857 days? (3 pts.)

(c) Dr. Medina purchased one of these space heaters. However, its lifespan was only 6105 days. How many standard deviations below the mean (z-score) is this lifespan? Round your answer to *three* decimal places. (3 pts.)

14. Mr. Lange is an avid golfer. In fact, he is among the best 0.1% of all golfers on Planet Earth. Below is a sample of his golf scores from the 2015 calendar year.

72 67 69 90 75 73 73 74 71 70 72

(a) Fill in the table below. (6 pts.)

Minimum	Lower Quartile	Median	Upper Quartile	Maximum

(b) Find the IQR of the data set. (2 pts.)

(c) Does the data set contain any outliers? If so, state *all* outliers. (5 pts.)

(d) Construct a stem-and-leaf plot for the data set. *Indicate a key for the display.* (6 pts.)

Stem	Leaf

Formula Sheet:

- Relative frequency:

$$\text{relative frequency} = \frac{\text{frequency}}{\text{sample size}}$$

- Sample mean:

$$\overline{x} = \frac{x_1 + x_2 + \cdots + x_n}{n}$$

- Sample standard deviation:

$$s = \sqrt{\frac{(x_1 - \overline{x})^2 + (x_2 - \overline{x})^2 + \cdots + (x_n - \overline{x})^2}{n-1}}$$

- IQR:

$$IQR = UQ - LQ = \text{Upper Quartile} - \text{Lower Quartile} = Q_3 - Q_1$$

- The fence equations to help in finding any mild outliers:

$$\text{Lower Fence} = LF = LQ - (1.5 \cdot IQR)$$
$$\text{Upper Fence} = UF = UQ + (1.5 \cdot IQR)$$

- z-score for observation x based on sample data or population data:

$$z = \frac{x - \overline{x}}{s} \qquad \text{or} \qquad z = \frac{x - \mu}{\sigma}$$