



**SIR ARTHUR LEWIS COMMUNITY COLLEGE  
ACADEMIC YEAR (2024/2025) - SEMESTER ONE  
END OF SEMESTER ALTERNATE EXAMINATION**

**COURSE TITLE : STATISTICAL APPLICATION**

**COURST CODE : MAT247**

**LECTURER : STEVEN AUGUSTE  
HANNAH SCOTT-REGIS  
ZIDANE HADEED**

**DATE : 15<sup>th</sup> January 2025**

**TIME : 9:00 a.m.**

**DURATION : 2 HRS**

**STUDENT ID# : .....**

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**READ THE FOLLOWING INSTRUCTIONS CAREFULLY.**

1. Write your student's ID number on all the work you hand in.
2. This paper consists of **two (2) sections**, answer *all* questions.
3. Formulae sheet and tables are provided
4. Write in **BLACK** or **BLUE** pen. (***NO WRITING IN PENCIL***)
5. Show all calculations and working.
6. **Only NON-PROGRAMMABLE calculators are permitted.**
7. Do not use correction fluid.

**DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO**



## SECTION A

*Instructions: Use your answer sheet to circle the correct response.*

1. Data that is collected directly to address a specific research question is referred to as:  
(a) Primary                      (b) Continuous                      (c) Discrete                      (d) Secondary
2. Which one of the following is an example of continuous data  
(a) Quantity of flour used in a cake                      (b) Number of flowers on a tree  
(c) Number of Chairs in the rooms                      (d) Number of babies born in a year
3. The value that has half of the observations above it and half the observations below it is called the  
(a) Mean                      (b) Median                      (c) Mode                      (d) Range
4. For a data set,  $\sum x = 128$  and a mean of 8. Therefore, the number of observations,  $n$  is equal to  
(a) 1176                      (b) 98                      (c) 70                      (d) 16
5. Which of the following statements about probability is correct?  
(a) It is always a positive value.  
(b) It can exceed 1 for certain cases.  
(c) It ranges only between 0 and 1.  
(d) It can take any value on the number line.
6. Which of the following is a characteristic of the normal distribution?  
(a) The distribution is always positively skewed  
(b) The mean, median, and mode are all equal  
(c) The distribution has only one peak  
(d) It is always bimodal
7. The main purpose of calculating a confidence interval is to estimate the:  
(a) Exact value of the sample statistic  
(b) Confidence level of the sample  
(c) True value of a population parameter  
(d) Sample size required for the study
8. The variance of frequency distribution measures:  
(a) The spread or dispersion of the data set  
(b) The central value of the data set  
(c) The relationship between the mean and median  
(d) The total number of observations
9. In statistics, the population refers to:  
(a) A subset of individuals selected from a larger group for analysis  
(b) The entire group of individuals or items that is the subject of study  
(c) A numerical value calculated from sample data  
(d) A measure of central tendency in a data set
10. Which measure of spread indicates the average distance of data points from the mean?  
(a) Range      (b) Variance      (c) Standard Deviation      (d) Interquartile Range

## SECTION B

Instructions: Answer all questions. Show all working.

1. (a) A survey was conducted at a university with 600 students. The contingency table below shows the department that the students belong to and whether they achieved a high grade or a low grade in their final course.

	Department			
	Engineering	Marketing	Psychology	Computer science
High grade	100	120	90	80
Low grade	50	60	40	60

- i. What is the probability that a randomly selected student achieved a high grade? [2]  
ii. What is the probability that a randomly selected student either achieved a low grade or is from the Engineering department? [3]  
iii. What is the probability that a randomly selected student achieved a high grade, given that they were from the Marketing department? [3]

(b) The following probability distribution table shows the number of smartphones sold by the top sales agents of a tech company in a day and their corresponding probabilities:

Number of smartphones, $x$	0	1	2	3	4
Probability ( $X = x$ )	0.10	0.15	b	0.30	0.20

- i. Find the value of b. [1]  
ii. On average, how many smartphones can a sales representative expect to sell during the campaign? [2]  
iii. Determine the variance in the number of smartphones sold during the campaign. [3]

2. (a) A bakery claims that 35% of its cakes are decorated with premium icing. A quality inspector randomly selects 8 cakes from a shipment to evaluate. What is the probability that:  
i. Exactly 3 of the cakes have premium icing? [2]  
ii. Fewer than 2 cakes have premium icing? [3]

(b) The weights of packages processed at a courier facility are normally distributed with a mean of 15 kg and a standard deviation of 3 kg. What is the probability that a randomly selected package weighs more than 18 kg? [3]

3. (a) The mean sugar content (in grams) recorded for 50 chocolate is 15g and a standard deviation of 3g. Construct a 99% confidence interval for the mean content of sugar in the chocolate bars. [3]

(b) The company claims that the average sugar content in their chocolate bars is 12.8 g. Test at the 5% significance level, whether the true mean content of sugar is less than 12.8g. [5]

**END OF EXAMINATION**