الجامعة الوطنية
National University
Science & Technology للعلوم والتكنولوجيا
كلية عمان البحرية الدولية
International Maritime College Oman

Final Exam
PCALC-II-I: STATISTICS
Fall 2025

Points of attention:

- For each question, the maximum earned points are specified in the question.
- Write clearly! Answers that are not readable are not marked and don't earn marks!
- All answers should be written in English using **blue or black pens** only.
- Use the pencil only for diagrams and graphs.
- Show all the calculation steps in the given space.
- When finished, submit the question paper, together with the answer scripts and the signed cover page to the invigilator.
- Any cheating/copying may result in an instant failing of the examination.

Exam Duration:	2 hours
Instructor's Name:	Muhammad Kazam Razaq
Exam Date:	28/12/2025
Program:	LTM

	40
	10

Student Information			
Name:		ID:	
Signature:			

Invigilator			
Initials:		☐ Student ID checked	
Time received:			

Question 1 **[5 marks]**

The monthly production units from a factory for 10 months are:

210, 220, 250, 230, 240, 260, 270, 280, 275, 225

Calculate the quartile deviation for the data.

Question 2 **[3 marks]**

The average number of customer orders processed per week in a company is 280 with a standard deviation of 40 orders. Use Chebyshev's theorem to find the percentage of processing more than 340 orders per week.

Question 3 **[2 marks]**

Calculate the coefficients of determination and non-determination and explain the meaning if $r = 0.62$

Question 4 **[7 marks]**

The monthly salaries of bank employees (OMR) are given below.

Salary (OMR)	No. of employees
301 – 400	12
401 – 500	20
501 – 600	25
601 – 700	15
701 – 800	8

a. Calculate the median of the monthly salaries. (3 marks)

b. Calculate the mode of the monthly salaries. (3 marks)

c. If the mean of the monthly salaries is OMR. 510, comment on the shape of the distribution . (1 mark)

Question 5 **[8 marks]**

A company recorded the monthly sales revenue (in OMR thousand) for 50 branches.

Revenue	Frequency
50 – 69	6
70 – 89	9
90 – 109	15
110 – 129	11
130 – 149	9

a. Calculate the variance of the monthly sales revenue. (6 marks)

b. Determine the coefficient of variation of the monthly sales revenue. (2 marks)

Question 6 **[7 marks]**

Oman Logistics Company recorded truck maintenance cost (OMR) and distance covered (km).

Distance (km)	Maintenance Cost (OMR)
3,000	120
4,000	160
5,000	200
6,500	240
7,000	280

a. Compute the correlation coefficient. (6 marks)

b. Give a brief explanation of the type of relationship. (1 mark)

Question 7 **[8 marks]**

A small business studies product price (OMR) and units sold.

Price	Units Sold
4	500
5	450
6	410
7	370
8	330

a. Determine the regression equation. (7 marks)

b. Predict the number of units sold when price is 6.5 OMR. (1 mark)

Formula sheet

Mean

$\bar{X} = \frac{\sum fX}{\sum f}$ (grouped data)

Median

$Median = l + \frac{\left(\frac{n}{2}\right) - cf}{f} \times h$ (grouped data)

Mode

$Mode = l + \frac{f_m - f_{m-1}}{2f_m - f_{m-1} - f_{m+1}} \times h$ (grouped data)

Quartile deviation

$QD = \frac{Q_3 - Q_1}{2}$

Mean deviation

$MD = \frac{\sum |X - \bar{X}|}{n}$ (ungrouped data)

$MD = \frac{\sum f|X - \bar{X}|}{n}$ (grouped data)

Sample Variance

$s^2 = \frac{\sum (X - \bar{X})^2}{n-1}$ **or** $s^2 = \frac{n\sum X^2 - (\sum X)^2}{n(n-1)}$ (ungrouped data)

$s^2 = \frac{\sum f(X - \bar{X})^2}{n-1}$ **or** $s^2 = \frac{n\sum fX^2 - (\sum fX)^2}{n(n-1)}$ (grouped data)

Sample Correlation coefficient

$r = \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{[n\sum X^2 - (\sum X)^2][n\sum Y^2 - (\sum Y)^2]}}$

Regression equation formulas

Slope= $b = \frac{n\sum XY - (\sum X)(\sum Y)}{n\sum X^2 - (\sum X)^2}$

Y-intercept = $a = \bar{Y} - b\bar{X}$ or $a = \frac{(\sum Y)(\sum X^2) - (\sum X)(\sum XY)}{n\sum X^2 - (\sum X)^2}$

$Y' = a + bX$

MLO & Bloom's Level of Complexity

Q #	MLO Addressed	Complexity Level	Mark	Remark
1	1	Understanding/ Application	5	Expect 90% to solve
2	2 & 3	Application/ Analysis	3	Expect 100% to solve
3	2 & 4	Application/ Evaluate	2	Expect 90% to solve
4	2 & 3	Application/ Analysis	7	Expect 80% to solve
5	2 & 3	Application/ Analysis	8	Expect 100% to solve
6	2 & 3	Application/ Analysis	7	Expect 90% to solve
7	2 & 4	Application/ Evaluate	8	Expect 90% to solve

Reference:

Bluman, A.G. (2018) *Elementary Statistics: A Step by Step Approach*. 10th edn. New York: McGraw-Hill.