THE OPEN UNIVERSITY OF SRI LANKA

FACULTY OF MANAGEMENT STUDIES

ADVANCED CERTIFICATE IN ENTREPRENEURSHIP AND SMALL BUSINESS MANAGEMENT (ESBM) PROGRAMME

OSC 2303 - BASIC MATHEMATICS AND STATISTICS

FINAL EXAMINATION – 2024/25

DURATION: TWO (02) HOURS

DATE: 24th MAY 2025 *TIME: 9.30 AM – 11.30 AM*

Instructions:

- **Answer FOUR (4) questions ONLY.**
- **All workings pertaining to answers should be clearly submitted.**
- **All questions carry equal marks.**
- **Use of a non-programmable calculator is allowed.**
- **This question paper carries 5 questions in 4 pages.**

Question 1

a) Solve the following equations for x:

i. $6(5x-2) = 4(4x+1)$ (4 marks)

ii. $\frac{4x}{3} - \frac{1}{2} = 2x + \frac{1}{6}$ (5 marks)

b) Solve the expression: $\frac{3(2x+3)}{x+7} = 4$; where, $x \neq 0$ (5 marks)

c) Solve the simultaneous equations

$x - \frac{y}{2} = 1$ and $\frac{x}{2} + \frac{y}{3} = 2\frac{5}{6}$ (5 marks)

d) A rectangle's length is 3 meters more than twice of its width. The perimeter of the rectangle is 46 meters. Find the length and the width of the rectangle. (6 marks)

(Total 25 marks)

Question 2

a) Find the solution of $x^2 + 2x - 15 = 0$ (5 marks)

b) Plot the graph for the above equation on a graph paper for x-values ranging from -5 to 5.

(8 marks)

c) Plot the graph for $Y = x + 1$ on the same graph paper for x-values ranging from -5 to 5

(8 marks)

d) Using the graphs, find the values of x , when $x^2 + 2x - 15 = x + 1$ (4 marks)

(Total 25 marks)

Question 3

a) A school is reviewing its stock of textbooks. The school has 120 mathematics textbooks, 150 science textbooks, and 80 history textbooks. The reviewer decides to sample 15% of the total textbooks for inspection.
Explain how you can select a stratified sample of the textbooks.

(9 marks)

b) The weights of 100 students selected from a school are shown in the following frequency distribution.

Weights (Kg)	30-34	35-39	40-44	45-49	50-54	55-59	60-64
Number of Students	05	08	20	30	23	10	04

i. Draw the histogram and the frequency polygon on the same graph. (8 marks)

ii. Find the mode of the distribution using the histogram and interpret the result.

(4 marks)

iii. Find the percentage of students whose weight is greater than or equal 49kg. (4 marks)

(Total 25 marks)

Question 4

a) The marks of a certain subject in a class of 70 students are given in the following frequency distribution.

Marks	10-20	21-31	32-42	43-53	54-64	65-75	76-86
Number of Students	5	12	16	20	11	4	2

06

Calculate the following measures.

i. Mean
ii. Median
iii. Mode (12 marks)
iv. Using the above answers, explain the properties of the marks of the subject. (3 marks)

b) A bag contains 4 red, 3 green, and 3 blue marbles. A student randomly draws a marble from the bag, records its color, and replaces it. Then they draw a second marble from the bag.

i. Draw a probability tree showing all possible outcomes of the two draws. (4 marks)

ii. calculate the probability that the student getting:

a. Two red marbles.

b. A blue marble after a red marble.

c. A red marble and a green marble (in any order).

(6 marks)

(Total 25 marks)

Question 5

a) If a person invests Rs. 120,000 in a savings plan that offers a simple interest rate of 6.5% per annum, what will be the total amount received after 8 years? (3 marks)

b) A person deposits Rs. 180,000 in a financial institution that offers an annual compound interest rate of 7%. What will be the total value of the investment after 4 years? (4 marks)

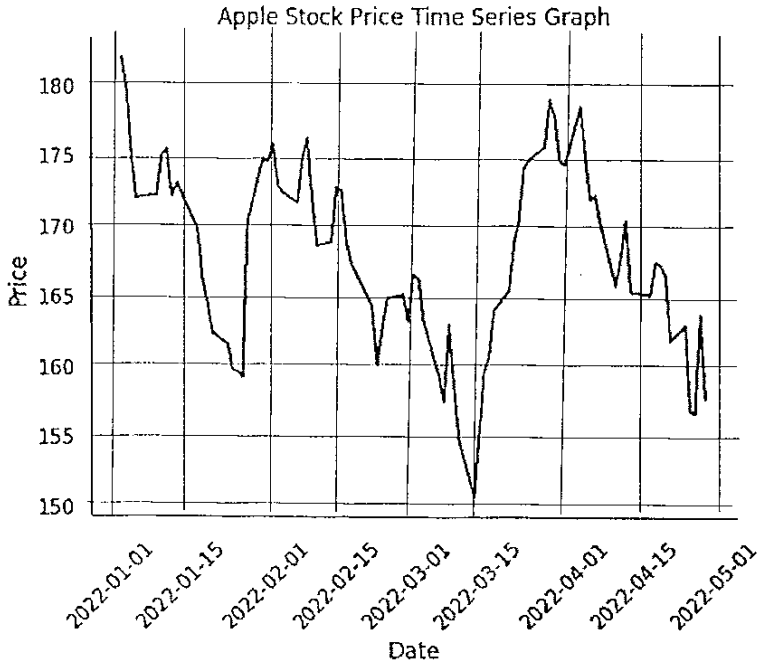
c) Classify the following variables as numerical or categorical, and identify the scale of measurement. (6 marks)

i. Brand of a smartphone.
ii. Number of siblings of a person.
iii. Temperature recorded in Celsius.

09

d) Interpret the following image with your knowledge on the components of a time series.

(12 marks)



(Total 25 marks)

Appendix

$$mean = \bar{x} = \frac{\sum fx}{\sum f}$$

$$median = L + \frac{\frac{n}{2} - F}{f} * c$$

$$mode = L + \frac{d_1}{d_1 + d_2} * c$$

10