



ASSOCIATION OF ACCOUNTING TECHNICIANS OF SRI LANKA

LEVEL 01 EXAMINATION - JULY 2026

(1902) BUSINESS MATHEMATICS AND STATISTICS

02-08-2026

Morning

[09.00 – 12.00]

• Instructions to candidates (Please Read Carefully):

- (1) **Time:** 03 hours.
- (2) **All questions should be answered.**
- (3) **Answers should be in one language, in the medium applied for, in the booklets provided.**
- (4) **Submit all workings and calculations. State clearly assumptions made by you, if any.**
- (5) **Use of Non-programmable calculators is only permitted.**
- (6) **Mathematical Tables and Graph Papers will be provided.**
- (7) **Action Verb Check List with definitions is attached. Each question will begin with an action verb excluding OTQ's. Candidates should answer the questions based on the definition of the verb given in the Action Verb Check List.**
- (8) **Formulae Sheets are attached.**
- (9) **100 Marks.**

No. of Pages : 10

No. of Questions : 06

SECTION A

Objective Test Questions (OTQs)

(Total 40 marks)

Question 01

Select the most correct answer for question No. 1.1 to 1.10. Write the number of the selected answer in your answer booklet with the number assigned to the question.

1.1 If, $5y + 7 = 23 + y$, the value of y is:

- (1) 4 (2) 5 (3) 6 (4) 7

(03 marks)

1.2 Karuna invested Rs.45,000/- in a private bank at the simple interest rate of 6.5% per annum. The total interest on the investment at the end of 4th year would be:

- (1) Rs.14,625/- (2) Rs.11,700/- (3) Rs.10,800/- (4) Rs.10,700/-

(03 marks)

- 1.3** In a class of 40 students, 22 students like Mathematics, 18 students like Economics and 10 students like both Mathematics and Economics.

The number of students who like only Mathematics is:

- (1) 10 (2) 12 (3) 22 (4) 30

(03 marks)

- 1.4** A garment factory produces T-shirts incurring a fixed cost of Rs.2,000,000/- per month. The total variable cost per T-shirt is Rs.600/-, and the selling price of a T-shirt is Rs.1,000/-.

The number of T-shirts that the factory must sell per month for Break Even Quantity is:

- (1) 2,000 (2) 3,000 (3) 5,000 (4) 1,000

(03 marks)

- 1.5** For a given data set, the mean, median, variance are 57.25, 58.43 and 56.25 respectively. The Coefficient of Skewness of the data is:

- (1) +0.472 (2) -0.06 (3) +0.06 (4) -0.472

(03 marks)

- 1.6** The number of training hours completed (X) and the performance ratings (Y) of 12 employees of a particular firm were recorded. The following descriptive statistics have been obtained from those recorded data:

$$\sum x = 104.3 \quad \sum y = 66.1 \quad \sum x^2 = 908.03 \quad \sum y^2 = 364.97 \quad \sum xy = 575.47$$

Based on the above data,

Correlation Coefficient between the training hours completed (X) and the performance ratings (Y) would be:

- (1) 0.76 (2) 0.84 (3) 0.68 (4) 0.93

(03 marks)

- 1.7** The prices of four different commodities in year 2024 and year 2025 are tabulated below:

Commodity	P	Q	R	S
Price in 2024 (Rs.)	2,000	1,700	2,500	1,300
Price in 2025 (Rs.)	2,500	1,500	2,300	1,500

Considering 2024 as the base year, the simple aggregate price index for the year 2025 is:

- (1) 104% (2) 96.15% (3) 103% (4) 95.16%

(03 marks)

1.8 **Amal** obtained a loan of Rs.1,000,000/- from a bank at an interest rate of 8% per annum compounded annually, for his daughter's wedding. The total amount that **Amal** needs to pay after 03 years would be:

- (1) Rs.12,400,000/- (2) Rs.240,000/-
 (3) Rs.259,712/- (4) Rs.1,259,712/- (03 marks)

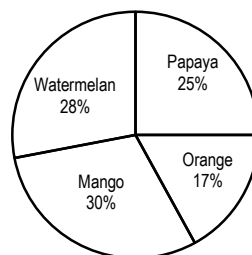
1.9 You are given the following frequency distribution:

x	0 - 9	10 - 19	20 - 29	30 - 39	40 - 49
f	8	14	17	22	12

The mode of the above frequency distribution is:

- (1) 36.17 (2) 26.17 (3) 32.83 (4) 22.83 (03 marks)

1.10 The following pie chart shows the distribution of sales of fruits (weight in kilograms) at **Thalawatugoda Fruits** during a specific day.



The total weight of fruits sold on the day is 600 kg. What is the weight of oranges sold on that specific day?

- (1) 150 kg (2) 180 kg (3) 102 kg (4) 168 kg (03 marks)

Write the answers for question No. 1.11 to 1.13 in your answer booklet with the number assigned to the question.

1.11 Relate the terms given on the left hand side of the following table with the number of the appropriate explanation given on the right hand side:

Term	Explanation
(A) Normal Distribution	(1) The direction in which time series is going in the long run.
(B) Random Experiment	(2) Long term oscillations or swings around a trend line or curve.
(C) Long Term Trend	(3) An observable outcome that could not be perfectly predicted in advance.
(D) Cyclical Variation	(4) A probability distribution that is symmetric about the mean.

(01 mark each, 04 marks)

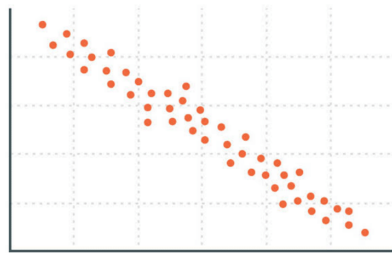
1.12 State two(02) statistical techniques used for decision making. (02 marks)

1.13 State two(02) steps involved in implementing data driven decision making. (02 marks)

State whether each of the following statements (**1.14** and **1.15**) is **True** or **False**. Write the answer (True/False) in your answer booklet with the number assigned to the question:

1.14 **Susila** calculated the moving averages for a time series using an even number of moving average length. When estimating the trend, she needs to compute the centered moving averages. (01 mark)

1.15 The scatter diagram given below shows an example of non-linear correlation.



(01 mark)

(Total 40 marks)

End of Section A

SECTION B

(Total 40 marks)

Question 02

(a) In a T20 World Cup tournament, a cricket team hit a total of 55 boundary shots consisting of sixes and fours. The total number of runs scored from these boundaries was 270.

You are required to:

(i) **Calculate** the total number of fours and sixes that the team hit. (04 marks)

(ii) **Calculate** the total number of runs scored from sixes only using your answer from part (i). (02 marks)

(b) Consider the following inequalities:

$$2x + 2y \leq 6 \quad , \quad 2x + y \leq 4 \quad , \quad x, y \geq 0$$

You are required to:

(i) **Present** the above inequalities in a graph paper. (03 marks)

(ii) **Identify** the area where all the inequalities are satisfied. (01 mark)

(Total 10 marks)

Question 03

- (a) A manufacturing firm produces “**Product Z**”.

The demand function per month is $p = 400 - q$. The firm has a fixed cost of Rs.10,000/- per month and the variable cost function per month is $VC = q^2 - 40q$.

(Where p = Price per bottle (Rs.) and q = Number of **Product Z** produced during the month.)

You are required to:

- (i) **Identify** the Total Cost (TC) function and the Total Revenue (TR) function. (04 marks)
 - (ii) **Calculate** the level of output that minimizes the total cost. (02 marks)
- (b) The following table shows the retail prices and the quantities of four selected consumer goods in the years 2020 and 2025:

Consumer goods	Unit	2020		2025	
		Price (P_0)	Quantity (q_0)	Price (P_1)	Quantity (q_1)
Fresh Milk	1 litre	100	10	200	8
Bread	1 loaf	60	12	110	16
Eggs	box with 4 eggs	60	6	120	8
Dhal	1 kg	150	4	320	2

Consider 2020 as the base year.

You are required to:

Calculate the Laspeyre’s Price index (*weighted aggregate price index*) of the consumer goods.

(04 marks)

(Total 10 marks)

Question 04

- (a) The following table shows the time (in minutes) spent by 50 customers waiting for lunch at **Pizza Palace** after placing their orders at the reception:

Waiting time (in minutes)	0 - 9	10 - 19	20 - 29	30 - 39	40 - 49
Frequency (f)	04	16	15	13	02

Using the above data,

You are required to:

Calculate the following:

- (i) Median (02 marks)
- (ii) Mean (02 marks)
- (iii) Standard Deviation (03 marks)

- (b) The following data shows the profits earned by a car selling company from different car brands.

Type of Car	Suzuki	Toyota	Mitsubishi	Honda
Profit (Rs. Million)	10	5	15	20

You are required to:

Present the above information in a bar chart.

(03 marks)

(Total 10 marks)

Question 05

- (a) There are 35 students in a classroom and 16 of them like Mathematics the most. 15 students like Music the most. The other 4 students like Geography the most.

You are required to:

Calculate the probability that a randomly selected student likes Music the most?

(02 marks)

- (b) There are two boxes, each containing 10 pens. **Box A** contains 6 blue pens and 4 red pens. **Box B** contains 3 blue pens and 7 red pens. One pen is randomly selected from each box.

You are required to:

- (i) **Present** the above data in a tree diagram.

(02 marks)

- (ii) **Calculate** the probability of selecting at least one blue pen.

(02 marks)

- (c) The lifetime of LED desk lamps produced in a factory follows a normal distribution with a mean of 1,200 hours and a standard deviation of 150 hours.

You are required to:

Calculate the probability that a randomly selected lamp has a life time of less than 1,000 hours.

(04 marks)

(Total 10 marks)

End of Section B

SECTION C

(Total 20 marks)

Question 06

- (A) (a) **Sam** invested Rs.50,000/- in a fixed deposit of a bank for 5 years at the interest rate of 8% per annum compounded semi-annually.

You are required to:

Calculate the maturity value of the investment at the end of 5th year.

(03 marks)

- (b) **Sithara** obtained a loan of Rs.450,000/- from a bank at an interest rate of 15% per annum and it is to be settled in equal annual installment of 3 years.

You are required to:

- (i) **Calculate** the annual installment of the loan. (02 marks)
- (ii) **Prepare** the amortization schedule to illustrate the repayments of the loan taken by **Sithara**. (03 marks)

- (B) **Mithu** is considering to invest in a new investment project with a time span of 3 years. The initial investment cost is Rs.150,000/-.

Net cash inflows over the next 3 years are as follows:

Year	1	2	3
Net Cash Inflows (Rs.)	40,000	50,000	80,000

The discount rate (cost of capital) for the project is 10% per annum.

You are required to:

- (a) **Calculate** the Net Present Value (NPV) of the project. (04 marks)
- (b) **State** whether **Mithu** should invest in this project, with reasons based on the NPV. (01 mark)
- (C) The following table provides the weights (x - kilograms in thousand) of 6 different models of motor cars and the fuel efficiency (y - kilometers per litre).

Motor car	A	B	C	D	E	F
x	1.5	2.0	2.5	2.8	3.0	3.5
y	10	9	7	6	5	4

Using the above data,

You are required to:

- (a) **Identify** the least square regression line given by, $y = a + bx$ to represent the relationship between weights of the motor car and fuel efficiency. (05 marks)
- (b) **Calculate** the fuel efficiency of a car with a weight of 4,000 kg. (02 marks)
- (Total 20 marks)

End of Section C

Action Verbs Check List

Level	Action Verb	Definition	Detailed Instructions for Students
REMEMBER Recalling facts, terms, basic concepts, or answers without necessarily understanding what they mean.	Identify	Recognition of someone or something.	Find and name key parts of the topic.
	Define	Meaning of a word or concept.	Provide a clear meaning of a term or concept.
	Recognise	Awareness of something seen before.	Spot and acknowledge something from previous learning.
	State	Clear and concise expression of information.	Express key facts or concepts in a straightforward way.
	List	A series of names, numbers, or items.	Write down key points in an organized manner.
	Record	Entry of details into a system (not accounting).	Enter relevant details clearly and accurately.
UNDERSTAND Comprehending the meaning of informational materials and being able to interpret or explain it.	Construct	Formation of something by combining elements.	Bring together different parts into a meaningful whole.
	Differentiate	Recognition of differences between two or more things.	Highlight distinctions between concepts or items.
	Discuss	Consideration of different ideas and opinions about a topic.	Explore various perspectives and provide insights.
	Explain	Clarification of something in greater detail.	Provide a logical and detailed description.
	Illustrate	Use of examples, charts, or visuals to clarify a point.	Support explanations with appropriate examples or visuals.
	Interpret	Explanation of the meaning of information or actions.	Explain what something means in your own words.
	Describe	A detailed account of something.	Provide relevant details in a structured manner.
	Summarise	A brief statement of the main points.	Present key information concisely.
APPLY Using learned material in new and concrete situations. It requires the practical application of knowledge and skills.	Apply	Use of knowledge, skills, or rules in a situation.	Utilise relevant knowledge or techniques to achieve an outcome.
	Calculate	Determination of a value through mathematical or logical methods.	Use numerical or logical processes to reach a solution.
	Determine	Establishment of something through research or calculation.	Find out or conclude something after calculation or research.
	Demonstrate	Display of a process or method.	Show a clear example through structured steps.
	Prepare	Organisation of materials or information for use.	Arrange necessary details before engaging in a task.
	Use	Application of a concept, tool, or method for a purpose.	Implement relevant knowledge or resources appropriately.
	Present	Sharing of information effectively.	Deliver key insights clearly and professionally.
ANALYSE Breaking down information into its components to understand its structure and relationships.	Analyse	Detailed examination of something to understand its components.	Break down information into key parts for better understanding.
	Compare	Examination of similarities and/or differences.	Point out the key commonalities and distinctions.
	Distinguish	Recognition of unique characteristics.	Identify what makes things different from each other.
	Examine	Inspection of something to determine its nature.	Look at something closely to understand it better.
	Outline	Summary of the main points.	Provide an organised overview of key aspects.
	Conduct	Organisation of elements for an experiment, survey, or study.	Follow structured steps to carry out a task systematically.
	Report	Structured presentation of findings.	Present analysed information in a clear and logical format.
EVALUATE Making judgments about the value or quality of ideas or materials based on criteria or standards.	Advise	Offering of suggestions or recommendations.	Provide informed guidance based on analysis.
	Evaluate	Critical assessment of value, effectiveness, or impact.	Judge the quality or relevance of something based on criteria.
	Formulate	Development of a structured approach or plan.	Create a well-defined method or strategy.
	Recommend	Suggestion of a suitable course of action.	Propose an approach backed by logical reasoning.
CREATE Combining elements in novel ways to form a coherent or functional whole; the ability to generate new ideas, products, or ways of understanding.	Create	Generation of something new.	Develop something original and purposeful.
	Assess	Estimation or evaluation of quality, ability, or nature.	Provide a reasoned judgment based on available information.
	Develop	Expansion or refinement of an idea, product, or concept.	Strengthen and improve an idea over time.
	Propose	Suggestion of a plan or concept for consideration.	Present an idea or structured recommendation.
	Synthesis	Combination of different elements to form a coherent whole.	Integrate multiple ideas or insights into a meaningful conclusion.
	Design	Creation of a structured plan for something	Formulate a detailed structure for a product or process.
	Compile	Assembly of information from various sources.	Organise collected data into a comprehensive format.

FORMULAE SHEETS

Mathematical Fundamentals:

Quadratic equation:

The solutions of a quadratic equation,
 $ax^2 + bx + c = 0$ is given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Arithmetic sequence:

Term of an arithmetic sequence:

$$T_n = a + (n - 1)d$$

The sum of first n terms of an AP:

$$S = \frac{n}{2} \{ 2a + (n - 1)d \}$$

Geometric sequence:

The term of a geometric sequence,

$$T_n = ar^{n-1}$$

The sum of first n terms of a GP:

$$S = a \frac{\{r^n - 1\}}{\{r - 1\}} \quad \text{if} \quad r > 1$$

$$S = a \frac{\{1 - r^n\}}{\{1 - r\}} \quad \text{if} \quad r < 1$$

$$S = na \quad \text{Otherwise} \quad r = 1$$

Quantitative Finance:

Simple interest:

$$S = X(1 + nr)$$

Compound Interest:

$$S = X \{1 + r\}^n$$

Discounting:

$$\text{Present Value} = \text{Future Value} \times \frac{1}{(1+r)^n}$$

Repayment of mortgage / Loan:

$$A = \frac{SR^n(R - 1)}{\{R^n - 1\}}$$

Effective Interest Rate:

$$\text{EIR} = \{(1 + r)^n - 1\} 100\%$$

Numerical Descriptive Measures:

Mean $\bar{x}$:

For ungrouped data: $\frac{\sum x}{n}$

For grouped data: $\frac{\sum fx}{\sum f}$

Median:

For Ungrouped data $M_d = \frac{(n + 1)^{\text{th}} \text{ term}}{2}$

For Grouped data $M_d = L_1 + \left[\frac{\frac{n}{2} - F_c}{f_m} \right] \times C$

Mode:

Grouped data $M_0 = L_1 + \frac{\Delta_1}{\Delta_1 + \Delta_2} \times C$

Standard deviation σ :

For ungrouped data:

$$\sqrt{\frac{\sum (x - \bar{x})^2}{n}} \quad \text{or} \quad \sqrt{\frac{\sum x^2}{n} - \bar{x}^2}$$

For grouped data:

$$\sqrt{\frac{\sum f(x - \bar{x})^2}{\sum f}} \quad \text{or} \quad \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2}$$

Coefficient of variation (CV):

$$\frac{\text{Standard deviation}}{\text{Mean}} = \frac{\sigma}{\bar{x}} \times 100$$

Coefficient of skewness = $\frac{3(\text{Mean} - \text{Median})}{\text{Standard Deviation}}$

Comparing Two Quantitative Variables:

Correlation coefficient (r):

$$\frac{[n \sum xy - \sum x \sum y]}{\sqrt{\{[n \sum x^2 - (\sum x)^2] \times [n \sum y^2 - (\sum y)^2]\}}}$$

Regression line under least square method (a and b):

$$b = \frac{[n \sum xy - \sum x \sum y]}{[n \sum x^2 - (\sum x)^2]}$$

$$a = \bar{y} - b\bar{x}$$

Comparison over time with Economic variables

Index Numbers:

$$\text{Price Relative} = \frac{p_1}{p_0} \times 100$$

$$\text{Quantity Relative} = \frac{q_1}{q_0} \times 100$$

$$\text{Value Relative } V_{1/0} = \frac{p_1 q_1}{p_0 q_0} \times 100$$

$$\text{Simple aggregate price index} = \frac{\sum p_1}{\sum p_0} \times 100$$

$$\text{Simple aggregate quantity index} = \frac{\sum q_1}{\sum q_0} \times 100$$

$$\text{Average price relative} = \frac{1}{n} \sum \frac{p_1}{p_0} \times 100$$

$$\text{Average quantity relative} = \frac{1}{n} \sum \frac{q_1}{q_0} \times 100$$

Weighted aggregate indices

1) Base-weighted / Laspeyres's:

$$\text{Price index} = \frac{\sum p_1 q_0}{\sum p_0 q_0} \times 100$$

$$\text{Quantity index} = \frac{\sum q_1 p_0}{\sum q_0 p_0} \times 100$$

2) Current-weighted / Paasche's:

$$\text{Price index} = \frac{\sum p_1 q_1}{\sum p_0 q_1} \times 100$$

$$\text{Quantity index} = \frac{\sum q_1 p_1}{\sum q_0 p_1} \times 100$$

3) Using standard weights

$$\text{Price index} = \frac{\sum p_1 w}{\sum p_0 w} \times 100$$

$$\text{Quantity index} = \frac{\sum q_1 w}{\sum q_0 w} \times 100$$

Weighted average of relatives

$$\text{Price index} = \frac{\sum [w \times I_p]}{\sum w} \times 100$$

$$\text{Quantity index} = \frac{\sum [w \times I_q]}{\sum w} \times 100$$

Time Series:

Multiplicative Model

$$Y = T \times S \times C \times R$$

Sets and Probability

U - Union; **A ∪ B** defines all elements in A plus all elements in B, no element being counted twice.

∩ - Intersection; **A ∩ B** defines all elements included in both A and B.

P (A) - Probability of event A

P (A/B) - Probability of event A, given B

General rules:

$$P (A \cup B) = P (A) + P (B) - P (A \cap B)$$

$$P (A/B) = \frac{P(A \cap B)}{P(B)}$$

Expectation and Variance of a discrete random variable:

$$E(X) = \sum (\text{probability} \times \text{pay off}) = \sum p \times x$$

$$VAR(X) = \sum p x^2 - (\sum p x)^2$$

Normal Distribution:

$$Z = \frac{x - \mu}{\sigma}$$