Association of Accounting Technicians of Sri Lanka

Level I Examination – July 2025

Suggested Answers

(102) BUSINESS MATHEMATICS AND STATISTICS (BMS)

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THE ASSOCIATION OF ACCOUNTING TECHNICIANS OF SRI LANKA

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(102) BUSINESS MATHEMATICS AND STATISTICS

SUGGESTED ANSWERS

(Total 40 Marks) **SECTION - A**

Suggested Answers to Question One:

1.1 (3)

Unit 01.2

16 - y2 = (4 – y)(4 + y) //

(03 marks)

1.2 (2)

Unit 02.2

Interest $= Xrn$ x= 50 000, n = 4, r = 0.12

$I = 50{,}000 \times 0.12X4$

$I = 24{,}000$

Interest = **Rs. 24,000**

(03 marks)

1.3 (4)

Unit 05.5

$$r = \frac{n\sum xy - \sum x.\sum y}{\sqrt{(n\sum x2 - (\sum x)2)\,(n\sum y2 - (\sum y)2)}}$$

$$r = \frac{5\ X\ 904 - 24\ X\ 179}{\sqrt{(5 \times 138 - 24^2)\,(5 \times 6499 - 179^2)}}$$

r = 0.9846

(03 marks)

1.4 (2)

Unit 07.3

$$P = \frac{P1}{P0} \times 100$$

$$P = \frac{6.8}{2.5} \times 100$$

$$= \mathbf{272\%}$$

(03 marks)

1.5 (3)

Unit 02.2

$S = X(1 + r/N)^{n \times N}$ S= 25000, n = 4, r = 0.05, N= 2

$S = 25000(1 + 0.05/2)^{4 \times 2}$

X = Rs. 30 460//

(03 marks)

1.6 (1)

Unit 6.3.4

P(A∩B) = P(A) × P(B)

P(X∩Y) = $\frac{3}{4} \times \frac{3}{5}$

P(X∩Y) = $\frac{9}{20}$ //

(03 marks)

1.7 (4)

Unit 6.5

$\boldsymbol{E[X]} = \sum x \times p$

$= 0 \times 0.15 + 1 \times 0.30 + 2 \times 0.2 + 3 \times 0.1 + 4 \times 0.25$

$= 2$ //

(03 marks)

1.8 (2)

Unit 04.6.

Median (Md)

$\frac{n}{2} = \frac{104}{2} = 52$, Median Class 69.5 – 79.5 (70 – 79)

L_1 = 69.5 n = 104 F_c = 50 F_m = 40 C = 79.5 – 69.5 = 10

$$\text{Md} = \text{L} + \frac{(\frac{n}{2} - Fc)}{fm} \times c$$

$$\text{Md} = 69.5 + \frac{(52-50)}{40} \times 10$$

Md = 70

(03 marks)

1.9 (3)

Unit 02.2

$S = X(1 + r)^n$ x= 80 000, n = 3, r = 0.04,

$S = 80\,000 \times 1.04^3$

S = 89 989.12

Interest = 89 989 – 80 000 = Rs. 9 989//

(03 marks)

1.10 (4)

Unit 07.15

$\hat{Y} = \hat{T} \times \hat{S}$

$\hat{Y} = 8560 \times 0.81$

$\hat{Y} = 6\,934$

(03 marks)

1.11

Unit 02.2/ 04.6 / 04.7

A ⟶ (2)

B ⟶ (3)

C ⟶ (1)

(01 mark each, 03 marks)

1.12 Unit 01.3

100+15 = 115

Selling price of a TV remote= $1000 \times \frac{115}{100}$

= Rs. <u>1150</u>

(02 marks)

1.13 Unit 07.6

p_1q_1	p_0q_1
7200	9000
1250	1000
2450	1750
10900	**11750**

Paasche's Price index $= \frac{\sum p1q1}{\sum p0q1} \times 100$

$= \frac{10900}{11750} \times 100$

= 92.77%

(03 marks)

1.14 Unit 07.10

True

(01 mark)

1.15 Unit 07.12

True

(01 mark)

(Total 40 marks)

End of Section A

Suggested Answers to Question Two:

Chapter 1

(a)

	Amal	Bimal	Chamal
	3	**2**	**-**
	-	**3**	**5**
Common Ratio:	**9**	**6**	**10**

Amila has received = 500 000 $\times \frac{9}{25} = Rs. 180\ 000.00$

(03 marks)

(b)

No. of Boys in a class is **X**

No. of Girls in a class is **Y**

80x + 40y = 4000 ——— ①

x + y = 60 ——— ②

X=40

Y=20

Number of Boys = **40**
Number of Girls = **20 //**

(04 marks)

(c)

500, 650, 800, ….

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

$T_n = 500 + 9 \times 150$

$T_n = Rs.\ 1850$ **//**

Amount she will save in the 10th week , $Rs.\ 1850$**//**

(03 marks)

(Total 10 marks)

Suggested Answers to Question Three:

Chapter 03

(a)

$TR = p \times q$ p = 24q – 3

$TR = (24q - 3) \times q$

$\boldsymbol{TR = 24q^2 - 3q \quad //}$

TC= $1800 - 6q + 24q^2$

$MC = \frac{dTC}{dq}$

$\boldsymbol{MC = -6 + 48q \; //}$

$\boldsymbol{MC = 48q - 6 \; //}$

(03 marks)

(b)

At the Break-Even Point

TR = TC

$\boldsymbol{24q^2 - 3q} = 1800 - 6q + 24q^2$

3 q = 1800

q = 600

break-even quantity = 600 units //

(04 marks)

(c)

p = 24q – 3

q = 600

p = 24x 600 – 3

p =14397

Selling price per unite = Rs. 14 397/600 = Rs.24

(03 marks)

(Total 10 marks)

Suggested Answers to Question Four:

Chapter 5

(a)

x	y	xy	x2
10	70	700	100
8	72	576	64
7	73	511	49
6	80	480	36
4	83	332	16

5	85	425	25
2	90	180	4
42	**553**	**3204**	**294**

$\sum X = 42 \quad \sum Y = 552, \quad \sum XY = 3204, \quad \sum X^2 = 294, \quad n = 7$

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

$$b = \frac{7 \text{ X } 3204 - 42 \text{ X } 553}{(87\text{X } 294 - 42^2)}$$

b = -2.71

$$a = \overline{Y} - b\overline{X}$$

$$a = \frac{553}{7} - (-2.71) \times \frac{42}{7}$$

a = 95.26

least square regression line Y = 95.26 - 2.71 x //

(08 marks)

(b)

Substitute, x = 40

$Y = 95.26 - 2.71\,x$

$Y = 95.26 - 2.71 \times 12$

$Y = 62.74$

Expected maintenance expenses = Rs. 62 740 ***//***

(02 marks)

(Total 10 marks)

Suggested Answers to Question Five:

***Chapter* 4**

Age	X	f	fx	Fx^2
0 - 9	4.5	5	22.5	101.25
10 - 19	14.5	8	116	1682
20 - 29	24.5	12	294	7203
30 - 39	34.5	20	690	23805
40 - 49	44.5	9	400.5	17822.25
50 - 59	54.5	4	218	11881
		58	∑f = 58	∑fx^2 = 62494.50

(a)

Mode class is 30-39

L_1 = 29.5, $\Delta_1 = 20 - 12 = 8$ **C = 10**

$\Delta_2 = 20 - 9 = 11$

$$M_o = L_i + \left[\frac{\Delta_1}{\Delta_1 + \Delta_2}\right] \times C$$

$$M_o = 29.5 + \left[\frac{8}{8+11}\right] \times 10$$

$$M_o = 33.71//$$

(03 marks)

(b)

1st Method (Using calculator)

$\sum f X = 1741$ $\sum f X^2 = 62494.5$ $\sum f = 58$

Mean $= \frac{\sum fX}{\sum f}$

$= \frac{1741}{58}$

$= 30.02$ //

(03 marks)

(c)

Standard Deviation = $\sqrt{\frac{\sum fx^2}{\sum f} - \left[\frac{\sum fx}{\sum f}\right]^2}$

Standard Deviation = $\sqrt{\frac{62494.5}{58} - \left[\frac{1741}{58}\right]^2}$ **=13.28 //**

(04 marks)

(Total 10 marks)

2nd Method

A = 34.5

X	f	d	fd	fd2
4.5	5	-30	-150	4500
14.5	8	-20	-160	3200
24.5	12	-10	-120	1200
34.5	20	0	0	0
44.5	9	10	90	900
54.5	4	20	80	1600
	58		**-260**	**11400**

(b) Mean $= A + \frac{\sum fd}{\sum f}$

$= 34.5 + \frac{-260}{58}$

$= 30.02$ //

(c)

Standard Deviation $= \sqrt{\frac{\sum fd^2}{\sum f} - \left(\frac{\sum fd}{\sum f}\right)^2}$

Standard Deviation $= \sqrt{\frac{11400}{58} - \left(\frac{260}{58}\right)^2}$

$= 13.28$ //

End of Section B

Suggested Answers to Question Six:

(A)

Chapter 2

(a)

$$A = \frac{x[1 - (1+r)^{-n}]}{r} \qquad A = 300\,000,\ n = 3,\ r = 0.2$$

$$300\,000 = \frac{x[1 - 1.2^{-3}]}{0.2}$$

$$x = \frac{300\,000 \times 0.2}{[1 - 1.2^{-3}]}$$

$$x = 142\,417.58$$

Or

$$A = \frac{300{,}000}{\text{PVIFA@20\% for 3 years}}$$

$$= \frac{300{,}000}{2.1065}$$

= Rs.142,417.58

annual installment is Rs. 142 417.58 //

(03 marks)

(b)

Year	Amount outstanding at the beginning	Annual Interest (20%)	Repayment (Instalment)	Amount outstanding at the end
1	300000	60000	142417.58	217582.42
2	217582.42	43516.48	142417.58	118681.32
3	118681.32	23736.26	142417.58	0.00

(03 marks)

(B)

Chapter 2

(a)

Year	Cash Flow		D.F. (10%)	Discounted cash flow	
	X	Y		X	Y
0	(100,000.00)	(100,000.00)	1	(100,000.00)	(100,000.00)
1	50,000.00	10,000.00	0.909	45450.00	9090.00
2	40,000.00	30,000.00	0.826	33040.00	24780.00
3	30,000.00	40,000.00	0.751	22530.00	30040.00
4	10,000.00	50,000.00	0.683	6830.00	34662.25
NPV				**7850.00**	**(1427.75)**

(04 marks)

(b)

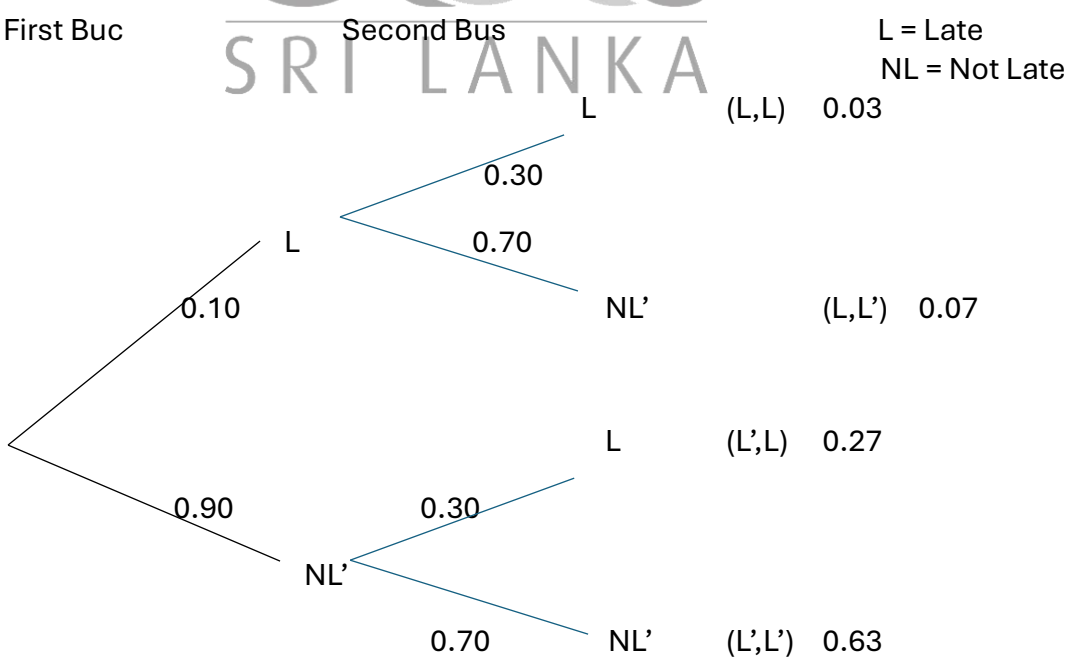
Net Present Value of project X is positive. Project Y has negative NPV.
Therefor Project X is the best investment.

(02 marks)

(C)

Chapter 6

(a)



(02 marks)

(b)

(L,L), (L,L'), L',L),

P(At least one bus will get late) = 0.1×0.3 + 0.1×0.7 + 0.9×0.3

= 0.37 //

=37% //

(02 marks)

(D)

Chapter 06.6

X : Daily income (Rs.)

μ= 50000 σ = 5000

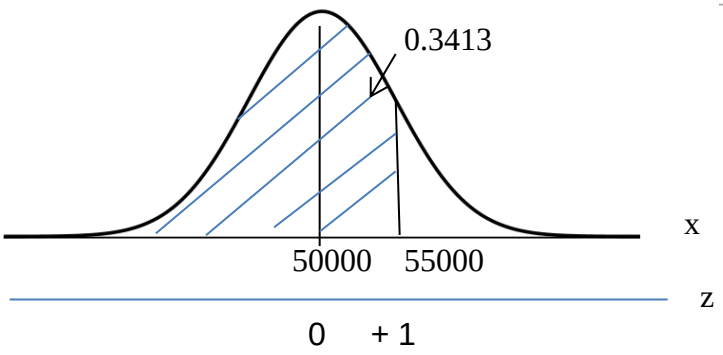
$$Z = \frac{X - \mu}{\sigma}$$

$$Z = \frac{X - 50000}{5000}$$

X = 55000

$$Z = \frac{55000 - 50000}{5000}$$

Z = + 1



Pr(X ≤180) = 0.5 + 0.3413 = 0.8413 or 84.13% //

(04 marks)

(Total 20 marks)

End of Section C

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