



INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS OF RWANDA
Driving Sustainable Performance



CERTIFIED ACCOUNTING TECHNICIAN LEVEL 1 EXAMINATION

L1.4: BUSINESS MATHEMATICS

WEDNESDAY: 3 DECEMBER 2014

INSTRUCTIONS:

1. **Time Allowed: 3 hours 15 minutes** (15 minutes reading and 3 hours writing).
2. This examination has **seven** questions and only **five** questions are to be attempted.
3. Marks allocated to each question are shown at the end of the question.
4. Show all your workings, where applicable.

QUESTION ONE

- a) Briefly explain the importance of functions in business (4 Marks)

A farmer can buy 3 cows and 5 goats for Frw 900,000, or 4 cows and 10 goats for Frw1, 400,000.

Required:

Find the price of each animal. (5 Marks)

- b) A manufacturer makes two products cheese and butter. The cost of making 15 units of cheese and 10 units' of butter is Frw 6,000. The cost of making 5 units of cheese and 8 units of butter is Frw 3,400. The manufacturer makes a profit of 20% and 25% on each of cheese and butter respectively.

Required:

- i) Express the cost of making one unit of product cheese and one unit of butter in form of simultaneous equations. (5 Marks)
- ii) Calculate the cost of making one unit of product cheese and butter. (3 Marks)
- iii) Calculate the selling price of one unit of each product cheese and butter. (3 Marks)

(Total 20 Marks)

QUESTION TWO

- a) Highlight five advantages of tabulating statistical data (5 Marks)

- b) The table below show the distribution of monthly salary of 300 employees of Inzu Ltd.

Monthly salary Frw “000”	Number of employees
5-10	16
10-15	24
15-20	58
20-25	100
25-30	42
30-35	30
35-40	20
40-35	10
	<u>300</u>

Required

- i) Calculate the mean monthly salary of employees (4 Marks)
- ii) Calculate the lower quartile monthly salary of the employees (3 Marks)
- iii) Calculate the upper quartile monthly salary employees (3 Marks)

Calculate the co-efficient of skewness and explain it (5 Marks)

(Total 20 Marks)

QUESTION THREE

- a) Briefly explain the following terms as used in probability:

- (i) Sample space. (2 Marks)
- (ii) Union of two sets. (2 Marks)

- b) A survey of 150 households was carried out at Nyabugogo suburb to find out the number of households that used detergents A, B and C respectively.

The results of the survey were as follows:

a	52 of the households used A
b	62 of the households used B
c	61 of the households used C
d	11 of the households used A and B
e	17 of the households used A and C
f	8 of the households used all the three detergents
g	1 household did not use any detergent

Required:

- Present the above information in a Venn diagram. **(5 Marks)**
 - The number of households which used only one detergent. **(3 Marks)**
 - Probability of those who used at most one detergent **(4 Marks)**
 - Probability of those who used at least two detergent **(4 Marks)**
- (Total 20 Marks)**

QUESTION FOUR

- a) The table below shows the quantities of four types of products consumed by a certain household in the years 2012 and 2013 and the unit price for each type of product.

Type of product	2012		2013	
	Price per (Kg)	Quantity	Price per (Kg)	Quantity
	“Frw”	(Kg)	“Frw”	(Kg)
P	1,500	100	1,800	120
Q	1,800	140	11,000	120
R	1,400	150	1,800	110
S	1,500	100	1,900	100

Required:

Using year 2012 as the base year, calculate:

- Laspeyre’s price index. **(5 Marks)**
- Paasche’s price index. **(5 Marks)**
- Fisher’s ideal price index. **(5 Marks)**

- b) Explain the importance of statistics **(5 Marks)**
- (Total 20 Marks)**

QUESTION FIVE

The quarterly statistics of agricultural income in Frw millions of a small economy are shown below for 3 years

	Quarter	Income (Frw Million)
2011	1	8
	2	10
	3	22
	4	10
2012	1	12
	2	16
	3	24
	4	14
2013	1	18
	2	22
	3	26
	4	14

Required:

- a) A three point moving average trend (10 Marks)
- b) Deseasonalised data assuming additive model (10 Marks)
- (Total 20 Marks)

QUESTION SIX

The following data shows the advertising expenditure spent by a company over a period of 12 months and the sales revenue derived in each of the months.

Month	Advertising Expenditure	Sales Revenue
	“000”	“000”
January	20	91
February	21	91
March	22	94
April	23	96
May	24	100
June	25	100
July	25	110
August	20	88
September	22	90
October	24	98
November	26	102
December	28	105

Required:

- (i) Identify the independent and dependent variables (2 Marks)
- Construct a scatter diagram for the data and comment on the relationship between advertising expenditure and sales revenue (5 Marks)
- (ii) Using regression analysis, determine the equation relating advertising expenditure to sales revenue (8 Marks)
- Determine the sales revenue in a month when advertising expenditure is Frw27,000 (2 Marks)
- (iii) Explain why it is not recommended to use the regression analysis in (iii) above to estimate the sales revenue in a month where advertising expenditure is Frw50,000. (3 Marks)
- (Total 20 Marks)

QUESTION SEVEN

- a) Venture Ltd is thinking of creating a sinking fund to retire its Frw 8,000,000 debenture capital which matures on 31 December 2022. Venture Ltd plans to put a fixed amount into the fund at the end of each year for 8 years. The first deposit will be made on 31 December 2014, and the last in December 2022. Venture Ltd expects that the fund will earn 20% interest per annum. What annual contribution must be made to accumulate to Frw 8,000,000 as at 31 December 2022? (4 Marks)
- b) A friend of yours has just purchased a photocopying machine on hire-purchase for Frw 168,030. He has paid a 50% down payment and agreed to pay the rest of the amount including interest at 24% pa in six (6) equal monthly installments. The interest will be charged on declining balance.

Required:

- i) Calculate the monthly installment. (2 Marks)
- ii) Prepare the repayment schedule of the amount borrowed. (12 Marks)
- What is the rate of interest on this financing arrangement per month? (2 Marks)
- (Total 20 Marks)

End of question paper