CERTIFIED ACCOUNTING TECHNICIAN
LEVEL 1 EXAMINATION
L1.4: BUSINESS MATHEMATICS
WEDNESDAY: 4 DECEMBER 2013

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) Production of **A** is such that the **square** of budgeted units for production less four times the units, less 8 units gives zero. The units are produced in thousands.

Required:

i. Number of units budgeted for production. **(5 Marks)**

ii. Given that the fixed cost of production is Frw 5 millions and variable cost per unit of Frw 4,800, determine the selling price that would result to a 20% profit margin. **(7Marks).**

b) A furniture shop in Rusumo makes tables and chairs. The cost of making 8 tables and 5 chairs is Frw 280,000. The cost of making 3 tables and 7 chairs is Frw 146,000. The shop makes a profit of 35% and 40% for each table and chair respectively.

Required:

i. Calculate the cost of making a table and a chair. **(4Marks)**

ii. Calculate the profit per unit made in Rwandan francs. **(4Marks).**

(Total 20 Marks)

QUESTION TWO

a) Purchase of share **A** in Rwanda Stock Exchange comes with a lottery ticket with a probability 0.2 of winning. Purchase of share **B** in the same exchange comes with a lottery ticket with a probability **0.15** of winning. The probability of choosing **A** or **B** is equal from a Broker and share prices are equal.

Required:

i. Construct a tree diagram to portray this situation involving sequential events. **(3 Marks)**

ii. What is the probability of an investor winning the lottery if he only has money to purchase one of the shares? **(3 Marks)**

What is the probability of an investor winning if he has money to purchase two shares? One after another? Such that after winning he stops purchasing? **(5 Marks)**

b) A new university in Kigali has the following faculty personnel, two professors, three associate professors and four assistant professors.

Required:

i. If two assistant professors are to be assigned to teach Business statistics, how many different pairs of two assistant's professors can be assigned? **(3 Marks)**

ii. If three faculty personnel are to be assigned to lead Business statistics randomly, what is the probability that the group will include exactly one professor, one associate professor and one assistant professor? **(6 Marks)**

(Total 20 Marks)

QUESTION THREE

Club Kigali is recreational club intending to invest surplus in one of three small ventures all requiring Frw 60 million which is available. Investment **A** expires in 7 years **B** in 5 years and **C** in 4 years.

Investment **A** has a constant cash flow of 14 million, **B** 16 million and **C** 20 million annually. The club has closed 12 % as its discount rate.

Required:

i) Which is the best venture (use Net Present Value method). **(10 Marks)**

ii) What Considerations may alter the best alternative from your calculations in (i) above **(1mark)**

iii) What is the internal rate of return of the best alternative in (i) above **(9 Marks)**

(Total 20 Marks)

QUESTION FOUR

The following table shows variation of advertisement expenditure with sales in seven districts for a product manufactured by Keltex Company Limited.

Districts	**Advertisement (X) Expenditure in millions Frw**	**Sales (X) in**
Musanze	10.5	17.3
Kicukiro	6.0	14.0
Nyabihu	8.7	19.1
Rusizi	9.3	14.5
Muhanga	11.8	20.0
Nyamagabe	7.5	16.3
Ngororero	15.0	23.8

Required:

(i)Determine the least Squares regression equation X= a+ b X for estimating sales from advertisement expenditure. **(12 Marks)**

(ii)Why do you think Kicukiro District spent the least in advertising? **(1 Mark)**

(iii)Estimate the level of sales for District in which 8.2 million is spent on advertisement. **(4 Marks)**

(iv) Determine Karl Pearsons coefficient of correlation between sales and advertisement expenditure. **(3 Marks)**

(Total 20 Marks)

QUESTION FIVE

Following is a table shows time taken to assembly a manufactured item by 30 employees seeking promotion.

Assembly times for 30 employees in minutes

10	14	15	13	17
16	12	14	11	13
15	18	9	14	14
9	15	11	13	11
12	10	17	16	12
11	16	12	14	15

Required:

(i) Group the data starting from 9 and using a uniform class interval of 2 i.e: 9-11, 12-14, etc with corresponding frequencies. **(4 Marks)**

(ii) Construct a cumulative frequency curve for the distribution to determine the 7^{th} decile, 4th percentile and the first quartile. **(12 Marks)**

(iii) Construct a histogram on the graph provided. **(4 Marks)**

(Total 20 Marks)

QUESTION SIX

a) Name four components of time series **(4 Marks)**

b) State two limitations of forecasting **(2 Marks)**

c)The following information has been supplied by Saks department of Agrobus limited.

Year	**1(quarter Frw Millions)**	**2 (quarter Frw Millions)**	**3 (quarter Frw Millions)**	**4 (quarter Frw Millions)**
2009	100	125	127	102
2010	104	128	130	107
2011	110	131	133	107
2012	109	132		

Required:

(i) Quarterly moving averages of the above series **(10Marks)**

(ii) Determine the trend line using semi averages method **(4Marks)**

(Total 20 Marks)

QUESTION SEVEN

a) Write short notes about spreadsheets **(4Marks)**

b) Describe the features and functions of spread sheets **(8Marks)**

c) Identify two advantages and two disadvantages of spreadsheets **(8Marks)**

(Total 20 Marks)

End of question paper