
CERTIFIED PUBLIC ACCOUNTANT

FOUNDATION LEVEL 1 EXAMINATION

F1.1: BUSINESS MATHEMATICS AND QUANTITATIVE METHODS

WEDNESDAY: 4 DECEMBER 2013

INSTRUCTIONS:

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

QUESTION ONE

- a) Highlight the use of functions in decision making **(2 Marks)**
- b) Describe how functions can be used in predicting cost behavior **(2 Marks)**
- c) A sofa set dealer in Cyanguu sells one type of sofa sets. During the month of May, June and July in year 2012, he realized profits of **Frw 240,000** from a sale of **7 sofa sets**, **Frw 248,000** from a sale of **9 sofa sets** and **Frw 226,000** from a sale of **4 sofa sets** respectively given that the profit function is Quadratic in nature

Required: Determine

- (i) The profit function. **(8 Marks)**
- (ii) Profit Maximizing output & maximum profit. **(8 Marks)**

(Total 20 Marks)

QUESTION TWO

Economics students in Butare wanted to study how the grade point Average grading system works.

They found out that:

A	4.0
B	3.0
C	2.0
D	1.0
F	0.0

The following is a table showing scores by a group of Students:

Grade Point Average	Number of Students
1.0 - 1.4	3
1.5 - 1.9	4
2.0 - 2.4	8
2.5 - 2.9	12
3.0 – 3.4	5
3.5 – 3.9	3

Required:

- a) Compute the values of the population mean **(6 Marks)**
- b) Compute the values of the population median **(6 Marks)**
- c) Compute the new Mean and scores of two students who sat special examinations and scored a mean of 3.2496, while the difference in their scores was 0.1. **(8 Marks)**

(Total 20 Marks)

QUESTION THREE

In the August National Census, from one district **31 households** had the following distribution of members:

5	7	5	9	7	2	12	8	8	6	7	4	9	11	9	5
6	4	8	10	7	7	9	8	6	5	3	4	4	6	9	

Required:

- a) By grouping the data continuously in class (starting with the lowest) intervals of 3. e.g 5-7, 7-9 derive a table for the grouped frequency distribution **(5 Marks)**

- b) On the graph paper provided, draw a histogram to represent the data **(5 Marks)**
- c) Draw a cumulative frequency curve to determine:
- i) 2nd Decile **(7 Marks)**
- ii) Upper quartile **(2 Marks)**
- d) State one role of Statistics **(1 Mark)**

(Total 20 Marks)

QUESTION FOUR

a) Explain the meaning and give an example of the following in business environment.

- i) Binomial Distribution **(4 Marks)**
- ii) Poisson Distribution **(4 Marks)**

b) KARENZI bakers based in Nyagatare bake whole grain sconces below the weight of 90 grammes is acceptable in the market. The sconces producing machine operates with a standard deviation of 12 grammes with a normal distribution.

The firms daily output is 400 sconces and the scone ingredients cost Frw 40 per 100 grammes. Sconces with weights in excess of 93 grammes require additional ingredients costing Frw 20 per scone.

Required:

- i) Mean weight at which the machine should be set **(4 Marks)**
- ii) Firm daily cost of production **(8 Marks)**

(Total 20 Marks)

QUESTION FIVE

a) Explain the following terms:

- i) Null hypothesis **(3 Marks)**
- ii) Type II Error **(3 Marks)**
- iii) Coefficient of correlation **(3 Marks)**
- iv) Coefficient of variation **(3 Marks)**

b) A manufacturer of television picture tubes tested 25 tubes to determine their mean life.

The sample yields an average of 4020 hours with a standards deviation of 390 hours.

Required:

- i) Population mean of the tubes at 99% level of confidence **(3 Marks)**
- ii) The manufacturer conducted research and found out that each tube with a mean life of over 4,500hours consumed 10% extra production cost which had be loaded on selling price before adjustment is Frw 24,500. Determine the new selling price. **(5 Marks)**

(Total 20 Marks)

QUESTION SIX

- a) Outline three components of time series. **(3 Marks)**
- b) State two advantages of exponential smoothing over moving average method of forecasting **(3 Marks)**
- c) The table below shows the sales of potatoes from Musanze district in a period of three years.

Year	Quarter 1	Quarter 2	Quarter 3	Quarter 4
	Frw millions	Frw millions	Frw millions	Frw millions
2009	45.0	66.5	51.2	67.8
2010	44.4	55.9	42.2	71.4
2011	49.3	73.2	68.5	83.0

Required:

- i) Explain the purpose of the seasonal index **(2 Marks)**
- ii) The seasonal index for each quarter assuming an additive model **(12 Marks)**
- (Total 20 Marks)**

QUESTION SEVEN

A project worth Frw 3 billion is to be undertaken by Minique Ltd in western province. The following table shows related activities.

Activities	Predecessors	Completion Time (days)
A	-	7
B	-	10
C	A	4
D	A	30
E	A	7
F	B,C	12
G	B,C	15
H	E,F	11
I	E,F	25
J	E,F	6
K	D,H	21
L	G,J	25

Required:

- a) Determine the projects expected completion time and its critical path. **(12 Marks)**
- b) Determine whether activities E and G can be performed at the same time without delaying the project completion. **(4 Marks)**
- c) Can one person perform A, G and I without delaying the project completion. **(2 Marks)**
- d) By how much time can activities G and L be delayed without delaying the entire project? **(2 Marks)**

(Total 20 Marks)

End of question paper