BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE
DEPARTMENT OF HUMAN RESOURCES MANAGEMENT
Course: HCM 102/ BS102 Quantitative Analysis for Business I (2)
Duration: 3 HOURS

NOV 2023

INSTRUCTIONS FOR CANDIDATES

1. Answer any **two** questions from section A and any **two** questions from section B.

INFORMATION FOR CANDIDATES

1. All questions carry equal marks.
2. No unauthorised items must be brought into the examination room.

MATERIALS ALLOWED

1. Scientific Calculator
2. Statistical Booklet
3. Graph Paper

SECTION A: Answer any **two** Questions

QUESTION 1

The following data gives the number of loaves of bread sold in 30 day by a certain retail shop in Bindura

37, 33, 33, 32, 29, 28, 28, 23, 22, 22, 22, 21, 21, 21, 20, 20, 19, 19, 18, 18, 18, 18, 16, 15, 14, 14, 14, 12, 12, 9, 6

Required:
i) Draw a stem and leaf display of the data	(5)
ii) Find the median, lower and upper quartile values of the data	(3)
iii) Hence draw a box plot of the data on graph paper	(5)
iv) Comment on the skewness of the data	(2)

[25]

QUESTION 2

Interval	Frequency
0-10	3
10-20	7
20-30	15
30-40	8
40-50	2

Calculate:

i) Mean   (5)

ii) Median   (5)

iv) Co-efficient of Variation   (5)

v) Coefficient of Skewness and comment   (10)

                                                                           [25]

QUESTION 3

a) A luxury passenger liner has 500 passengers on whose ages are normally distributed around a mean of a mean of 60 years with a standard deviation of 12 years. How many passengers are

i) between 45 and 78 years old.   (5)

ii) older than 78 years.   (5)

iii) younger than 45 years.   (5)

b The lifetime of an experimental energy –savings device has an exponential distribution with a mean of 2 years and its cumulative distribution function given by $P(X=x) = 1 - e^{-\frac{x}{\theta}}$

i) what is the probability that the device will last more than 3 years.   (5)

ii) what is the probability that the device will last less than 2 years.   (5)

Section B: Answer any two Questions

QUESTION 4

a) Solve the following linear equations using Cramer's rule.

$$3x - 4y = 1$$
$$7x + y = 23$$

(10)

b) Use Cramer's Rule to solve for X_1, X_2 and X_3

$$-2X_1 - X_2 - 3X_3 = 3$$
$$2X_1 - 3X_2 + X_3 = -13$$
$$2X_1 - 3X_3 = -11$$

(15)

[25]

QUESTION 5

a) Express the following as logarithms of single numbers.

i) $3\log z - 4\log h + 5\log d$

(5)

ii) $2\log a + \log b - 5\log c$

(5)

iii) $4\log x - 2\log y - 4\log z$

(5)

b) Given the supply and demand functions

$$P = 2Q^2{}_S + 10Q_S + 10$$
$$P = -Q^2{}_D - 5Q_D + 52$$

Calculate the equilibrium price and quantity.

(10)

[25]

QUESTION 6

A principal of $10 000 is invested at one of the following banks:

(a) Bank A offers 4.75% interest, compounded annually.   (5)

(b) Bank B offers 4.70% interest, compounded semi-annually.   (5)

(c) Bank C offers 4.65% interest, compounded quarterly.   (5)

(d) Bank D offers 4.6% interest, compounded continuously.   (5)

Which bank would you choose to invest in if you decided to invest the principal for 5 years and why?   (5)

[25]

End of Paper