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

INSTRUCTIONS FOR CANDIDATES

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

INFORMATION FOR CANDIDATES

MAR 2022

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

Given the following data set

1	12	8	16	6	9	4	7	20	10
3	11	18	12	8	10	2	9	13	22
3	7	9	17	17	23	6	9	11	2
15	5	7	4	14	28	8	19	25	10

Required:

i) Draw a stem and leaf display of the data (10)
ii) Find the median, lower and upper quartile values of the data (5)
iii) Hence draw a box plot of the data on graph paper (5)
iv) Comment on the skewness of the data (5)

[25]

QUESTION 2

The following data shows weekly wages of a sample of 65 employees of a bus company:

Wages ($)	250-260	260-270	270-280	280-290	290-300	300-310	310-320
No of Employees	8	10	16	14	10	5	2

Required

Calculate

i) the mean. (5)

ii) the median. (5)

iii) Standard Deviation (5)

iv) Co-efficient of Variation (5)

v) Co-efficient of Skewness (5)

[25]

QUESTION 3

a) On average six people per hour use an electronic teller machine during prime shopping hours in a department store.

What is the probability that;

i) Exactly 4 people will use the electronic teller machine in an hour? (5)

ii) less than 3 people will use the electronic teller machine in an hour? (5)

iii) between 5 and 8 people will use the electronic machine in an hour? (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)

[25]

Section B: Answer any two Questions

QUESTION 4

i) Solve the system of equations

$2x_1 + 4x_2 = 16$
$3x_1 - 5x_2 = -9$
using Cramer's Rule to find x_1 and x_2 (10)

ii) Using Cramer's rule solve for x_1 , x_2 and x_3

$x + 2y + 3z = -5$
$3x + y - 3z = 4$
$-3x + 4y + 7z = -7$ (15)

[25]

QUESTION 5

a) Sketch the graph of a firm's profit function:

$f(Q) = -10Q^2 + 80Q - 120$

Find the maximum profit of f(Q). (10)

b) Given the total revenue and total cost functions:

$TR = -4Q^2 + 28Q$
$TC = 4Q + 20$

i) Derive the firm's profit function in terms of Q. (5)

ii) Calculate the values of Q for which the firm breaks even. (5)

iii) Calculate the value of Q for which the firm maximizes profit. (5)

[25]

QUESTION 6

a) A principal amount of, $7000, is invested at 9% interest for 8 years. Determine its future value if the interest is compounded

(i) annually
(ii) semi-annually
(iii) monthly
(iv) continuously (10)

b) Suppose that it is possible to invest in only one of two different projects.

i) Project A requires an initial outlay of $2000 and yields $2200 in 4 years' time.

ii) Project B requires an outlay of $25 000 and yields $30 000 after 4 years.

Which of these projects would you choose to invest in when the market rate is 3% compounded annually using NPV method. (15)

[25]

End of Paper