BINDURA UNIVERSITY OF SCIENCE EDUCATION

OCT 2023

FACULTY OF COMMERCE

DEPARTMENT OF HUMAN RESOURCES MANAGEMENT

Course: HCM 102/ BS102 Quantitative Analysis for Business I (1)

Duration: 3 HOURS

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 cotton bales produced by 30 new farmers in Mashonaland Central in Zimbabwe

42	45	40	38	35	47
40	27	39	43	40	53
23	51	42	48	36	51
40	48	34	20	42	32
33	32	39	41	36	16

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

Hourly wages paid to different employees of a company are given in the table below:

Hourly Wage $	350- 360	360-370	370-380	380- 390	390-400	400- 410	410- 420	420-430
Frequency	1	2	2	4	5	6	3	2

Calculate:

i) Mean age (5)

ii) Median age (5)

iii) Standard Deviation (5)

iv) Co-efficient of Variation (5)

v) Coefficient of Skewness and comment (5)

[25]

QUESTION 3

a) The amount of time required per individual at a bank teller's window has been found to be approximately normally distributed with a mean u= 130 seconds and a standard deviation σ= 45 seconds.

What is the probability that a randomly selected individual will;

i) require less than 100 seconds to complete a transaction? (5)
ii) spend between 2.0 minutes and 3.0 minutes at the teller's window? (5)

b) The reported scores on nationally standardized achievement test for high school graduates have a mean of u = 500 with a standard deviation σ= 100. The scores are approximately normally distributed. What is the probability that the score of a randomly chosen individual will be ;

i) between 500 and 550. (5)
ii) more than 550 (5)
iii) less than 400. (5)

[25]

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) The graphs of supply and demand functions are given below:

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

Calculate the equilibrium price and quantity. (10)

b) The demand and supply functions of a good are given by:

$$P = -2Q_D + 50$$
$$P = 0.5\ Q_S + 25$$

where P, Q_D and Q_S denote the price, quantity demanded and quantity supplied respectively.

(i) Determine the equilibrium price and quantity. (5)

(ii) Determine the effect on the market equilibrium if the government decides to impose a fixed tax of \$5. (10)

[25]

QUESTION 6

a i) Determine the rate of interest required for a principal of $500 to produce a future value of $2000 after 5 years compounded continuously. (5)

ii) Find the future value of $20 000 in 2 years' time if compounded quarterly at 8% interest. (5)

b) An investment project requires an initial outlay of $18 000 and will produce a return of $27 000 at the end of 5 years. Use the

i) net present value

ii) internal rate of return

methods to decide whether this is worthwhile if the capital could be invested elsewhere at 15% compounded annually. (15)

[25]

End of Paper