

**BINDURA UNIVERSITY OF SCIENCE EDUCATION**

**FACULTY OF COMMERCE**

**DEPARTMENT OF HUMAN RESOURCES MANAGEMENT**

**Course: HCM 201/BS201 Quantitative Analysis for Business II (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**

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

NOV 2024

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**SECTION A: Answer any **two** Questions**

**QUESTION 1**

a) It is required to test the hypothesis that 50% of the households have a freezer. A random sample of 400 households found that 54% of the sample had freezers. The significance level is 5%. (10)

b) A trade union claims that the average hourly rate paid to domestic workers throughout the country is \$285. The house wives league wishes to test this claim. The League conducted a survey with a sample of 250 domestic workers. The results revealed that a mean hourly of \$303 and a standard deviation of \$100. Test the hypothesis at 5% level of significance that the hourly rate paid to domestic workers throughout the country is \$285.

(15)

[25]

## QUESTION 2

A company manufactures two kinds of products, chairs and tables. The chair requires 5 minutes to make and a table requires 4 minutes to make. There is a total of 30 hours of labor available. A chair and table will generate a profit of \$100 000 and \$200 000 respectively. The company wants to produce at least 100 chairs and 100 tables.

**Required:**

Formulate a linear programming problem and solve it graphically.

[25]

## QUESTION 3

A business analyst believes that capital utilisation (as measured by inventory turnover) has a direct effect on a company's earnings yield. To examine this belief, the analyst randomly surveyed nine Zimbabwe Stock Exchange-listed companies and recorded their inventory turnover and their earnings yield.

Inventory Turnover	3	5	4	7	6	4	8	6	5
Earnings Yield	10	12	8	13	15	10	16	13	10

- (i) Construct a scatter diagram and comment (5)
- (ii) Estimate the regression line, using the least squares method. (10)
- (iii) Calculate the coefficient of determination. (5)
- (iv) Estimate the earnings yield for an inventory turnover of 10 and comment (5)

[25]

## Section B: Answer any two Questions

### QUESTION 4

a) Differentiate the following functions:

i)  $y = e^{23x}$  (5)

iii)  $y = xe^{3x}$  (5)

b) The total revenue function of a firm is given as  $TR = 26x - x^2$  and its total cost function as  $TC = \frac{1}{x} + x^3 + \frac{1}{2}x^2 - 30x + 150$  where  $x$  is the output.

**Required:**

- i) The output that maximizes total revenue. (5)
- ii) The output that minimizes total cost (5)
- iii) The maximum profit (5)

[25]

### QUESTION 5

The quarterly demand levels for electricity in Bindura for the years 1998 to 2000 in thousands of Kilowatts are as follows:

Years	Quarter			
	I	II	III	IV
1998	28	31	40	27
1999	32	38	49	38
2000	47	47	55	41

**Required**

- i) Find the seasonal index for each quarter. (15)
- ii) Deseasonalize your time series and interpret your findings. (10)

[25]

### QUESTION 6

The following are prices in dollars and quantities of six food items consumed by a typical family in 2021 and 2022

Item	Price(\$) (2013)	Quantity in Units (2013)	Price(\$) (2014)	Quantity in Units (2014)
Bread	0.87	50	1.28	55
Rice	1.05	26	2.17	20
Eggs (Dozen)	1.05	102	3.87	130
Milk(500ml)	2.94	30	1.16	40
Sugar	0.86	40	2.54	41
Coffee	3.43	12	3.68	12

#### Required

Using year 2022 as base year, calculate:

- i) the Laspeyres indices for 2014 and comment on your results (10)
- ii) the Paasche indices for 2014 and interpret on your findings (10)
- iii) the Fishers ideal index for 2014 and comment (5)

[25]

**End of Paper**