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

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 small publishing company decides to use one section of its plant to produce two textbooks called Microeconomics and Macroeconomics. The profit made on each copy is $12 for Microeconomics and $18 for Macroeconomics. Each copy of Microeconomics requires 12 minutes for printing and 18 minutes for binding. The corresponding figures for Macroeconomics are 15 and 9 minutes respectively. There are 10 hours available for printing and 10,5 hours available for binding.

i) Formulate a linear programming model to maximize profit. (5 marks)
ii) Solve graphically (20 marks)

[25]

QUESTION 3

Training Hours	20	36	20	38	40	33	32	28	40	24
Output	40	70	44	56	60	48	62	54	63	38

(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 comment. (10)

[25]

Section B: Answer any two Questions

QUESTION 4

Differentiate the following functions with respect to x

a) $y = \frac{(2x-7)}{(4x^2+8)}$ (5)

b) $y = 9x\ln(1+x^7)$ (5)

c) $y = x^2 e^{-x^2}$ (5)

d) $y = (e^{2x}+1)^3$ (5)

e) $y = (4x+1)(6x+3)$ (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

Use 2000 as the base period and 100 as the base value.

Item	2000		2006	
	Price	Quantity	Price	Quantity
Dress (each)	$75	500	$85	520
Shoes (pair)	$40	1200	$45	1300

    i)   Determine the Laspeyres price index   (10)

    ii)   Determine the Paasche price index   (10)

    iii)   Determine Fishers Ideal Index   (5)

[25]

End of Paper