BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE

DEPARTMENT OF HUMAN RESOURCES MANAGEMENT

Course: HCM201/BS201 Quantitative Analysis for Business II (1)

Duration: 3 HOURS

INSTRUCTIONS FOR CANDIDATES

1. Answer any **two** questions from section A and any **two** questions from section B.
2. All questions carry equal marks.
3. 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 manager of Eastgate shopping mall in Harare believes that visitors to the mall spend on average 85 minutes in the mall on any one occasion. To test this belief the manager commissioned a survey with a random sample of 132 visitors to the mall, the average visiting time was 80.5 minutes. Assume a population standard deviation of 25 minutes and that visiting time is approximately normally distributed.

Required:

(i) Formulate the null and alternative hypothesis for this test situation. (5)

(ii) Conduct a hypothesis test for a single mean at 5% significance level to support or refute the manager's belief. (10)

b) The Retail Association of Zimbabwe believes that the average amount spent on groceries by Harare shoppers on each visit to a supermarket is $175. To test this belief, the association conducted a survey among a random sample of 360 grocery shoppers at selected supermarkets in Harare. Based on the survey, the average value of grocery purchases was $182.40. Assume that the population of grocery purchase values is normally distributed with a standard deviation of $67.50. Test the claim that the average amount spent on groceries by Harare shoppers on each visit to a supermarket is $175 at 5% level of significance (10)

[25]

QUESTION 2

A man can carry 62 kg of commodities on his bicycle to sell. He cannot afford more that \$180 for his commodities at this time. For \$2, he can buy a bottle of cooking oil which weighs 1 kg and sells it for \$2, 85. For \$ 3 he can also buy a packet of surf, which weighs 0.8 kg and sells it at \$3.95

i) State the linear programming model to maximize his profit. (5)

ii) Using the graphical method, how many bottles of cooking oil and packets of surf should he buy from his wholesaler to maximize profit? Find his maximum profit. (20)

[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) Graphically display the relationship between inventory turnover and earnings yield for the sample of nine companies. What relationship can be observed? (5)

ii) Calculate a linear regression equation to express the relationship between the inventory turnover and earnings yields of companies. (10)

iii) Construct the correlation coefficient between inventory turnover and earnings yield. Does this value support the business analyst's view? Comment. (5)

iv) Find the coefficient of determination between earnings yield and inventory turnover. (5)

[25]

Section B: Answer any two Questions

QUESTION 4

Differentiate the following functions:

i) $y = \frac{(4x-14)}{(8x^2+16)}$ (5)

ii) $y = x^4 e^{-x^2}$ (5)

iii) $y = 6\ln(4+5x^5)$ (5)

iv) $y = x^3 \ln(2x+5)$ (5)

v) $y = \frac{x^2(2x+5)^3}{(x^2+4)}$ (5)

[25]

QUESTION 5

A hotels monthly occupancy rate (measured as a percentage of rooms available) is reported as follows:

Months	Year	Occupancy %
Sept	2005	74
October	2005	82
November	2005	70
December	2005	90
January	2006	88
February	2006	74
March	2006	64
April		69
2006		58
May		65
2006		
June		
2006		

Required

i) Produce a line graph of the hotel occupancy rate. (5)

ii) Fit a least squares trend line to the hotel s occupancy rate. (10)

iii) Estimate the hotel occupancy rate for July 2006 and August 2006. (5)

iv) Comment on your findings. (5)

[25]

QUESTION 6

The following information relates to prices and quantities of blank video tapes sold in January 1995 and January 1999:

Length of Video Tapes	1995		1999	
	Price $	Quantity	Price $	Quantity
30 minutes	40	32	56	40
60 minutes	43	150	61.50	190
90 minutes	46	1000	74.00	130

Base year is 1995

Required:

i) Calculate the Lasperyres Price Index for 1999. (10)

ii) Calculate the Paasche Price Index for 1999. (10)

iii) Calculate the corresponding Fishers Index and Comment. (5)

[25]

End of Paper