

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

BACHELOR OF COMMERCE (HONOURS) DEGREE

QUANTITATIVE ANALYSIS FOR BUSINESS CIN 1207

SUPPLEMENTARY EXAM

AUGUST 2005

DURATION: 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Answer all questions in Section A
 2. Choose and answer three(5) out of (6) questions in Section B
 3. Graph paper will be provided
 4. Statistical tables will be provided
 5. You may use a non-programmable Scientific Calculator
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SECTION A (ANSWER ALL QUESTIONS) [40 MARKS]

QUESTION ONE

- a) The rate of inflation in Zimbabwe over the last five years was 13%; 18%; 20%; 30%; 40%. Find the average rate of inflation in Zimbabwe over the five year period. **[3marks]**
- b) A company proposes to sell 40Kg of denim material at \$40 per Kg and 60 Kg Corduroy at \$50 per Kg and quotes an average of \$ 45 per Kg material. Correct this figure if you disagree with the average. **[4 marks]**
- c) In the state lotteries, how many 6-digit numbers can be formed from the 10 digits 0-9, if repetitions are allowed? **[2 marks]**
- d) List:
- i) Three (3) methods of data collection. **[3 marks]**
 - ii) Three (3) methods of sampling. **[3 marks]**
- e) A fair die is rolled once. What is the probability that it turns in a value which is at most 4? **[2 marks]**
- d) A pair of fair dice is rolled once. What is the probability that the sum on the dice is:
- i) an even number? **[3marks]**
 - ii) at least 3? **[4 marks]**

- f) A motorist travels at 150 km/hr over a 50 km stretch of road, and 130km/hr Over another hilly 50 km portion. Find the motorist's overall average speed over the entire journey? **[4 marks]**
- g) How many different sums of money can be obtained by choosing two coins? from a box containing a 5 cent piece, a 10c **[2 marks]**
- h) How many arrangements can we make from the letters of the word? "Mississippi" **[2 marks]**

Total [40 marks]

QUESTION TWO

A real estate company specializing in sales of farms would like to know if their salespeople's sales can be predicted based on the number of years with the company. A random sample of sales is taken for 10 salespeople having years of experience ranging from 1 to 10 years and is given below:

Years of experience	1	2	3	4	5	6	7	8	9	10
Number of sales	3	2	5	4	6	8	9	9	12	10

- i) Plot the scatter graph for the data. **[5 marks]**
- ii) Find the sample regression equation using the Least Squares method. **[4 marks]**
- iii) Predict sales for someone with 15 years experience, from the Least Squares equation. **[4 marks]**
- iv) Compute the co-efficient of determination and comment. **[7 makes]**
- Total [20 marks]**

QUESTION THREE

Firm	DEFECTIVE TUBES PER BOX OF 100 UNITS				Total
	0	1	2	3 or more	
Supplier A	500	200	200	100	1 000
Supplier B	320	160	80	40	600
Supplier C	600	100	50	50	800
Total	1 420	460	330	190	24 00

Compute the following probabilities:

- i) If one box had been selected at random from this universe, what are the probabilities that the box would have come from supplier A? Supplier B? **[2 marks, 2marks]**
- ii) If a box was selected at random, what is the probability that it would contain two defective tubes? **[4 marks]**
- iii) If a box came from supplier A, what is the probability that the box would have 2 or less defectives?

iv) It is known that a box selected at random has two defective tubes, what is the probability that it came from supplier A? from supplier B? from supplier C?

[4 marks each]

Total [20 marks]

QUESTION FOUR

The following figures relate to credit reports prepared by a credit reporting agency for 100 business days:

60	43	64	58	52	52	67	59	60	51
62	56	63	61	68	57	51	59	47	42
64	43	67	52	58	47	59	64	58	52
63	48	65	60	61	59	63	56	62	56
62	57	59	62	56	63	55	73	60	69
53	66	54	52	54	61	55	65	55	61
59	74	62	49	63	63	53	71	59	46
64	41	60	51	55	64	46	64	56	59
49	64	60	57	58	66	53	65	62	58
65	61	50	55	57	61	45	43	60	66

i) Construct a frequency distribution table starting at 40, using an interval width of 5. **[6 marks]**

ii) From the grouped frequency distribution in i) above, calculate the

a) mean. **[4 marks]**

b) median. **[5 marks]**

c) mode **[5 marks]**

Total [20 marks]

QUESTION FIVE

The local chamber of commerce has commissioned some market research into the spending habits of the local adult population. A random sample of 500 adults has been selected as follows:

<u>Age group (years)</u>	<u>Number in sample</u>
18-<21	54
21-<30	63
30-<45	167
45-<60	85
60 and over	131
Total	500

From Government census statistics, it is known that the local adult population has the following distribution:

<u>Age group (years)</u>	<u>% of population</u>
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18-<21	13
21-30	12
30-<45	38
45-<60	15
60 and over	22

What comment can you make about the age profile of the selected sample compared to that of the population (Carry out a Chi-squared test using $\alpha = 5\%$ then comment)

Total [20 marks]

QUESTION SIX

A company is analyzing a random sample of its computer record of customers. Among the results are the following distributions:

Size of order \$ ('000)	Number of customers	
	April	September
10-<20	8	4
20-<30	19	18
30-<40	38	39
40-<50	40	69
50-<60	22	41
60-<70	13	20
70-<80	<u>4</u>	<u>5</u>
	144	196

a) Which month shows a higher order size? **[6 marks]**

b) Compare the two distributions using the Co-efficient of variation.

[14 marks]

Total [20 marks]

QUESTION SEVEN

a) It is known from experience that in a certain Industry 60% of all labour-management disputes are over wages, 15% are over working conditions and 25% are over fringe benefits. Also, 45% of the disputes over wages are resolved without strikes, 70% of the disputes over working conditions are resolved without strikes and 40% of the disputes over fringe benefits issues are resolved without strikes. What is the probability that a labour-management dispute in this Industry will be resolved without a strike?

[10 marks]

b) A consignment of items is found to be 10% defective. For a random sample of 5 items selected from this consignment, what is the probability distribution of X, where X is the number of defective items in the consignment?

[10 marks]

Total [20 marks]

*****END OF EXAMINATION*****