

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

BACHELOR OF COMMERCE (HONOURS) DEGREE

QUANTITATIVE ANALYSIS FOR BUSINESS CIN 1106

JULY 2005 SUPPLEMENTARY EXAMINATION PAPER

DURATION: 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Choose and answer 5 out of 7 questions.
2. Graph paper will be provided (on request)
3. Statistical tables will be provided (on request)
4. You may use a non-programmable Scientific Calculator

QUESTION 1

Raggs Ltd., a clothing firm, has fixed costs of \$ 10 000 per year. These are costs such as rent, maintenance and so on, which must be paid no matter how much the Company produces. To produce x units of a certain kind of suit it costs \$20 per unit in addition to the fixed costs. That is, the variable costs are $20x$ dollars. These are costs which are directly related to production, such as material, wages, fuel, and so on. Then the total cost, $C(x)$, of producing x suits in a year is given by a function, C :

- a) Give the specific function for total Cost. (5marks)
- b) Plot the graphs for variable cost, fixed cost, and total cost functions, on the same axes. (12marks)
- c) What is the total cost of producing:
 - i) 100 suits? (1mark)
 - ii) 400 suits? (1mark)
- d) How much more does it cost to produce 400 instead of 100 suits? (1mark)

[Total: 20marks]

QUESTION 2

The following is a table showing quantity demanded of 5 Kg bags and price (in \$ per bag):

Demand Schedule

Quantity(x) Number of 5 Kg bags (Millions)	Price(\$) per bag
4	\$ 5
5	4
7	3
10	2
15	1

- a) Use the above data to construct a graph of Demand and price, where the quantity demanded depends on the price per unit, and give the appropriate model depicting the relationship. (8marks;8marks)
- b) Comment on your graph. (4marks)

[Total: 20marks]

QUESTION 3

Aba Ltd keeps track of its total costs of producing x items of a certain suit. These data are shown below:

Number of Suits(x)	Total cost(C) of producing x units
0	\$ 10 000
1	\$ 10 030
2	\$ 10 059
3	\$ 10 094

- a) Use the data points (1, 10 030) and (3, \$ 10 094) to find a linear function that fits the data, and plot the graph. (8marks,8marks)
- b) Use your function in a) to predict the total cost of producing:
- i) 4 suits ii) 10 suits (2marks,2marks)

[Total: 20marks]

QUESTION 4

ODD JOBS repair services schedules jobs according to the number and type of workers-Carpenters, Plumbers, and Electricians- that will be available each day. Job type A requires four(4) hours of Carpenter labour, two(2) hours of Plumbing labour and two(2) hours of Electrical labour. If the supervisor knows that on the next three days the following kinds and quantities of labour will be available, which jobs should be scheduled for each day?

	MONDAY	TUESDAY	WEDNESDAY
Carpenter labour(hours)	16	14	24
Plumbing labour(hours)	12	18	15
Electrical labour(hours)	19	20	24

[Total:20 marks]

QUESTION 5

The following is a table of prices and quantities of a certain commodity.

Raw Material	1999	Quantity	2000	Quantity
	Total Revenue		Total Revenue	
	\$		\$	
A	130	50	100	60
B	220	40	150	50
C	200	30	120	40
D	120	20	160	30
E	115	10	115	20

[1999=100]

Calculate:

- a) the Price Relative for Raw Material C (2marks)
- b) Fischer's Ideal Price Index (12marks)
- c) The Unweighted Aggregative Price Index. (6marks)

[Total:20 marks]

QUESTION 6

The following Input-Output table describes the two-industry Economy of a Country.

	User		Final Consumer Demand	Total Output
	Industry X	Industry Y		
Producer				
Industry X	80	50	130	260
Industry Y	60	40	150	250

If demand for the output of Industry X is predicted to increase by 25% while demand for the output of Industry Y decreases by one third, determine the total output vector that will satisfy these demands.

[Total:20 marks]

QUESTION 7

The owner of Pinetree apartments has 100 apartments available for rent. A market survey indicates that all 100 apartments can be rented at \$400 per month but that for each \$10 increase in rent one fewer apartment will be rented.

- a) Determine the revenue function for the apartments. **[5 marks]**
 - b) What rent should be charged each month in order to maximize the revenue from apartment rentals? **[5 marks]**
 - c) How many apartments will be rented at the monthly rate? **[5 marks]**
 - d) What will be the total revenue at this monthly rate? **[5 marks]**
- [Total:20marks]**

END OF EXAMINATION