



"Investing in Africa's Future"

FACULTY OF MANAGEMENT AND ADMINISTRATION

COURSE TITLE: MMS 204 QUANTITATIVE ANALYSIS II

SEMESTER 2: FINAL EXAMINATION NOVEMBER 2013

LECTURER: MR P. TARAMBAWAMWE

TIME: 3 HOURS

INSTRUCTIONS

ANSWER **Three** QUESTIONS

MATERIALS: 2 graph papers; formulae sheet and answer booklet.

Q2 a. Define and distinguish using appropriate formulae, the differences between laspeyres and Paasche price index numbers. **[5marks]**

b. During 1990 a student at Africa University made the following nonacademic purchases: 26 pizzas, 250 drinks, 14 CDs, one pair of shoes, one pair of pants, 10 shirts, and four pairs of earrings. The prices in 1990 were pizzas \$5.00, drinks \$0.50, CDs \$7.00, shoes \$45.00, pants \$22.00, shirts \$ 15.00 and earrings \$4.50. In 1993 the prices were pizzas \$5.60, drinks \$0.55, CDs \$6.00, shoes \$47.00, pants \$22.00, shirts \$ 16.00 and earrings \$4.20. Student wages for those on work study increased from \$4.75 per hour in 1990 to \$5.25 in 1993.

i. Compute a simple aggregate price index. **[3 marks]**

ii. Compute the weighted price index for 1993 using 1990 as the base year. **[5 marks]**

iii. Were students better off in 1993 or in 1990 and why? **[2 marks]**

b. A technology product T consists of four components, K , L , M and N . The following table shows the average prices and the price indices of these components as well as the percentages of these components used in manufacturing the product.

Component	K	L	M	N
Price in the year 1995 (\$)	100	116	x	60
Price in the year 1999 (\$)	170	y	200	120
Price index for the year 1999 based on the year 1995	170	175	200	z
Percentage used in the product (%)	h	10	20	50

(i) Find the values of x , y and z .

[3 marks]

(ii) State the value of h . Hence, find the composite index representing the cost of the components used in the product in the year 1999 based on the year 1995. **[2 marks]**

Q2 a. Draw network diagrams for the following project **[4 marks]**

ACTIVITY	Preceding Activity
A	-
B	-
C	B,C
D	C

- b. The following tables show the precedence tables for two projects. For each
- Draw a network diagram showing node numbers, start times and end times for each activity.
[12 marks]
 - What is the completion time. **[2 marks]**
 - Show the critical path on the network diagram. **[2 marks]**

1.

ACTIVITY	Preceding Activity	Duration in weeks
A	-	4
B	-	6
C	A	3
D	B	9
E	B	10
F	E	12
G	C,D	9
H	E	2
I	F	3
J	G,H	15
K	I,J	9

2.

ACTIVITY	Duration in months
1-2	8
2-4	60
1-3	25
3-4	6
4-5	10
3-6	45
5-6	10
6-7	20

- Q3**
- After knee surgery, your trainer tells you to return to your jogging program slowly. He suggests jogging for 12 minutes each day for the first week. Each week thereafter, he suggests that you increase that time by 6 minutes per day. How many weeks will it be before you are up to jogging 60 minutes per day? **[2 marks]**
 - Find a_6 for an arithmetic sequence where $a_1 = 3x+1$ and $d = 2x+6$. **[2 marks]**

c. How many terms of the arithmetic sequence -3, 2, 7, ... must be added together

for the sum of the series to be 116? **[2 marks]**

d. You complain that the hot tub in your hotel suite is not hot enough. The hotel tells you that they will increase the temperature by 10% each hour. If the current temperature of the hot tub is 75°C , what will be the temperature of the hot tub after 3 hours, to the *nearest tenth* of a degree **[4marks]**

e. A manufacturer produces 750 computers each week. After every two weeks, he increases

production by: Scheme I: 35 computers fortnightly

Scheme II: 2.5% each fortnightly

(i) Find the output in week 28 under each scheme. **[4 mark]**

(ii) Find the total output over the first 15 weeks under each scheme. **[6 marks]**

] Q4 (a) Four married couple bought 8 seats in the same row for a concert. In how many different ways can they be seated?

(i) With no restrictions. **[2 marks]**

(ii) If one couple is to sit together **[2 marks]**

(iii) If each couple is to sit together? **[3 marks]**

(iv) If each couple should not sit together? **[3 marks]**

b. How many 3 digit numbers can be formed from the digits 0, 1,2,3,4,5 where a digit can be repeated

i. greater than 100 **[2 marks]**

ii. even numbers **[2 marks]**

iii. greater than 400 but divisible by 5. **[2 marks]**

c. How many permutations can you have with the letters from word **SCHEME**

i. without restrictions and ii when the Es are together **[4 marks]**

Q5 a.

‘ I got the quarterly figures of salesmen’s performance through yesterday and I thought I’d see if there is any connection between how far they travel and how many sales they make, so I put them through our computer package that does correlations, but I can’t make sense of the bits at all- could you interpret, please.’

The information enclosed with the memo is as follows:

<u>Salesman</u>	<u>Mileage(km)</u>	<u>No. of Sales</u>	<u>Time with Company(Months)</u>
Smith	256	27	32
Adams	462	8	6
Williams	322	34	36
Green	211	25	28
Murphy	153	18	8
Evans	186	23	12
Newton	372	38	50
<u>Sam</u>	<u>223</u>	<u>19</u>	<u>12</u>

Regression equation for no. of sales on time with company is $Y = 11.35 + 0.55X$

Correlation coefficient: mileage and no. of sales = - 0.03. Regression equation for no. of sales on mileage is:

$$Y = 24.72 + 0.003X$$

- Write notes to guide you in explaining to the sales manager what this information means, and how it should be interpreted in the light of the data. **[10 marks]**
- Calculate the coefficient of correlation and coefficient of determination of the time with the company and number of sales and interpret it **[10 marks]**