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KNOWLEDGE FOR DEVELOPMENT

UNIVERSITY MAIN EXAMINATIONS

2017/2018 ACADEMIC YEAR

FIRST YEAR FIRST SEMESTER

FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

COURSE CODE: MBA 804

COURSE TITLE: QUANTITATIVE ANALYSIS

DATE: 17/01/2018 **TIME: 2 – 5PM**

INSTRUCTIONS TO CANDIDATES

Answer **All** questions in Section A and Any other **TWO (2)** Questions from **section B**

SECTION A

QUESTION ONE

a) Suppose you have the following Research Question

- To what extent does weight of a car in pounds predict miles per gallon in a U.S. dataset of 398 models of cars?

i) Are the two variables discrete or continuous?

ii) Are the two variables nominal, ordinal, interval or ratio scales?

iii) Which statistical procedure could we use to test the research question?

iv) What is the null hypothesis?

v) What is your expectation?

b) The regression SPSS output of the above question was as below. Use it to answer the following questions

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.807[a]	.651	.650	4.622

a. Predictors: (Constant), Vehicle Weight (lbs.)

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15794.632	1	15794.632	739.503	.000[a]
	Residual	8457.943	396	21.358		
	Total	24252.575	397			

a. Predictors: (Constant), Vehicle Weight (lbs.)

b. Dependent Variable: Miles per Gallon

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	45.492	.841		54.110	.000
	Vehicle Weight (lbs.)	-.007	.000	-.807	-27.194	.000

a. Dependent Variable: Miles per Gallon

i) How much variance in Miles Per Gallon is explained by Car Weight?

ii) Is this variance explained significantly different to 0?

iii) What is the constant

iv) What is the slope?

v) Is the slope statistically significant?

vi) Write out the model regression equation

vii) What is the standardised regression coefficient for vehicle weight?

viii) If a car weighed 1000 pounds, what would be the predicted miles per gallon?

ix) What is the standard error of the estimate?

x) What would be the approximate 95% confidence interval of our prediction

QUESTION TWO (20 MKS)

(a) Because of inreasing cost increasing cost energy, the population within Bungoma county seem to be shifting from the north to the south the transition matrix S describes the migration behaviour observed between the regions.

to north to south

$$S = \begin{pmatrix} 0.90 & 0.10 \\ 0.05 & 0.95 \end{pmatrix}$$ from north / from south

determine whether the populations will attain an equillibrium condition and if so, the population of the two regions.

(b) A simple hypothetical economy of three industries A, B and C is represented in the following table (data in millions of shillings).

User / Producer	A	B	C	Final Demand	Total Output
A	80	100	100	40	320
B	80	200	60	60	400
C	80	100	100	20	300

Determine the output vector for the economy if the final demand changes to 60 for A, 60 for B and 60 for C

(c) A tea blender uses two types of tea, T_1, and T_2, to produce two blends, B_1 and B_2 for sale. B_1 uses 40% of available T_1 and 60% of the available T_2 whilst B_2 uses 50% of the available T_1 and 25% of the available T_2.

Required:

Given that t_1 kilos of T_1 and t_2 of T_2 are made available to produce b_1 kilos of B_1 and b_2 kilos of B_2. Express the blending operation in the matrix format.
If 400 kilos of T_1 and 700 kilos of T_2 were made available for blending, what quantities of B_1 and B_2 would be produced?

If 600 kilos of B_1 and 450 kilos of B_2 were produced, use a matrix method to determine what quantities of T_1 and T_2 would be used to produce the blends.

QUESTION THREE (20 MKS)

A market researcher is interested in the coffee drinking habits of males and females. He asks a sample of male and female office workers to record the number of cups of coffee they consume during a week.

a) Which parametric statistical technique could the researcher use to determine if males and females differ in terms of the number of cups of coffee consumed in a week?

Justify your answer and describe how you would obtain this statistic using SPSS.

b) What are the key values you would look for in the output?

c) What assumptions should you check for when using the technique that you chose in question (a), above.

d) What non-parametric technique could be used to address this research question?

QUESTION FOUR (20 MKS)

The following represents activities of a network.

Activity	Preceding Activity	Duration Days
A	-	4
B	A	7
C	A	5
D	A	6
E	B	2
F	C	3
G	E	5
H	B,F	11
I	G,H	7
J	C	4
K	D	3
L	I,J,K	4

Required:

Draw the network diagram and find the critical path (10mks)
Calculate the floats of the network in question (10mks)

QUESTION FIVE

(a) The probability transition matrix of the switching probabilities, consider that two brands G and X share the market in the ratio of 60% to 40% respectively of customers. If in every week 70% of G's customers retain the brand but 30% switch to product x where as 80% of X's customers retain brand but 20% percent switch to brand G. Analyse the exchange in share market per week.
(10 mks)

(b) A marketing division toothpaste manufacturing company has worked out the following transition probability matrices concerning the behaviors of customers before and after an advertising campaign.

Transition probability matrix
(before advertising campaign)

	TO	
FROM	**Our Brand (State I)**	**Another Brand (Sate II)**

Our brand (State I)	0.8	0.2
Another Brand (sate II)	0.4	0.6

Transition probability matrix
(After advertisement)

FROM	TO	
	Our Brand (State I)	**Another Brand (Sate II)**
Our brand (State I)	0.9	0.1
Another Brand (sate II)	0.5	0.5

If the advertising campaign costs Shs 20,000 per year, would it be worthwhile for the company to undertake the campaign?
You may suppose there are 60,000 buyers of toothpaste in the market and for each customer average annual profit of the company is Shs 2.50 (10 mks)