

### DATE: 16/8/2021

TIME: 8.30-10.30 AM

#### **INSTRUCTIONS:**

- (i) Answer Question **ONE** and any other **TWO** questions
- (ii) Show all your workings clearly

### **QUESTION ONE (COMPULSORY) (30 MARKS)**

	a)	Explain	briefly th	e following concepts	
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- i) Econometric modelling (5 marks)
- ii) Model validity (5 marks)
- b) A hotel is interested in determining the factors that influence students' consumption patterns in Machakos University. As a researcher you are consulted to conduct a study and estimate an appropriate econometric model.
  - Explain the steps that you should follow to develop this econometric model using a suitable economic theory (7 marks)
  - ii) Explain briefly three tests you can conduct to evaluate the statistical significance of the variables used in the model (3 marks)
- c) A researcher wanted to find out the relationship between firms' monthly sales of cars (S) and their expenditure on advertisement (A). He sampled ten firms and obtained the following summary statistics of their monthly sales and expenditure on advertisement in thousands of Kenya Shillings as follows:

$$\bar{A} = 519 \qquad \bar{S} = 300$$

 $\sum a^2 = 3,134,543 \sum as = 1,296,836 \qquad \sum s_i^2 = 539,512$ 

- i. Estimate the sales function and interpret the results (5 marks)
- ii. Determine the part of variation in sales which is not explained by the advertisement expenditure (5 marks)

# **QUESTION TWO (20 MARKS)**

The monthly incomes and savings in thousands of Kenya Shillings of eight employees in a firm are recorded as follows.

Employees	Ann	Ben	Carol	Dan	Esther	Faith	John	Nelly
Incomes	10	18	17	15	13	19	16	12
Savings	1	7	6	5	3	8	5	2

Assuming the relationship  $Y = b_0 + b_1 x + e$ 

- a) Estimate and interpret the savings function of the employees. (8 marks)
- b) Calculate the residual savings for a monthly income of KShs 15,000 (2 marks)
- c) Evaluate the statistical significance of the model on the basis of the following criteria.
  - i. Coefficient of determination (2 marks)
  - ii. Standard error test (8 marks)

## **QUESTION THREE (20 MARKS)**

Discuss the following econometric problems that might arise in econometric modeling giving their possible causes, effects and possible solutions

a)	Autocorrelation	(10 marks)
b)	Multicollinearity	(10 marks)

## **QUESTION FOUR (20 MARKS)**

A research firm conducted a study to determine the influence of some variables on foreign direct investment inflows (fdi) of different countries. The variables were expressed as follows: degree of openness (open), gross domestic product (gdp), external debt (exd), inflation (inf), lending interest rate (lir), political stability (stabp) and internet use (internetuse). A regression analysis was conducted using STATA and the following results were generated.

Random-effects Group variable		ion		Number Number	of obs of groups	=	120 8
	= 0.3598 n = 0.7068 l = 0.5527			Obs per	group: mii avg max	9 =	15 15.0 15
corr(u_i, X)	= 0 (assumed	d)		Wald ch Prob >		=	138.39 0.0000
fdi	Coef.	Std. Err.	z	P>   z	[95% Coi	ηf.	Interval]
exd inf lir internetus~e open stabp gdp Cons	.0132411 0680575 .1184756 .0627497 .0721435 070728 .1070815 -2.874631	.006075 .0342542 .0320118 .0432225 .0119181 .0170722 .0624757 1.031152	2.18 -1.99 3.70 1.45 6.05 -4.14 1.71 -2.79	0.029 0.047 0.000 0.147 0.000 0.000 0.087 0.005	.001334 135194 .055733 021964 .048784 104188 015368 -4.89565	5 5 3 4 9 7	.0251479 0009205 .1812176 .1474641 .0955025 0372672 .2295316 8536105
sigma_u sigma_e rho	0 1.8095382 0	(fraction	of variar	nce due t	:o u_i)		

a) Explain the impact of independent variables on the dependent variable (5 marks)

b) Discuss the statistical significance of the estimated coefficients of the model (10 marks)

c) Explain briefly five ways you would assess the accuracy of the estimation technique used

(5 marks)

#### **QUESTION FIVE (20 MARKS)**

a) A researcher wanted to confirm whether dairy farmers in different regions produced any statistically different outputs of milk. He sampled ten farmers from four regions and observed their monthly mean milk outputs. He then conducted Anova test and generated the following results on SPSS.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	79.821	4	19.955	0.002	.0.008
Within Groups	4287.619	95	45.133		
Total	4367.440	99			
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- i.State the hypothesis for the Anova test(2 marks)ii.Interpret the above Anova results(6 marks)
- b) State four reasons for including an error term/disturbance term (u) in a stochastic economic model (4 marks)
- c) Briefly explain four types of economic models (8 marks)