Answer **ALL** Questions

Time allowed: **02 hours**

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01) a) Briefly discuss how you can make use of the "methodology of econometrics", while taking into account a two variable regression model.

b) Set the "Null and Alternative Hypothesis" for the model given below and decide whether they are accepted or rejected at 5% significant level:

Food Expenditure = 263.6416 + 0.0056 Total expenditure + 2.2316 Total income

$$Se = \quad (11.5932) \quad (0.0019) \qquad\qquad (0.2099)$$

$$t = \quad (22.7411) \quad (2.8187) \qquad\qquad (10.6293)$$

$$p \ value = \quad (0.0000) \quad (0.0065) \qquad\qquad (0.0000)$$

$$r^2 = 0.7077; \qquad\qquad df = 61$$

$$F_{2, 61} = 31.1034 \ (P \ value = 0.0000)$$

02) a) Briefly explain how you can include dummy variables (while making use of different levels as examples) into multiple regression models.

b) The following table shows a time series data column. Formulate a testing procedure to show whether the given data set obeys or does not obey the MLR (Multiple Linear Regression) assumption of free from "Autocorrelation".

Y_t	$X2_t$	$X3_t$
45.69	14.53	16.74
44.64	15.3	16.81
48.27	15.92	19.5

1

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03) Write **Short Notes** on the following:

a) Method of OLS (Ordinary Least Square) estimation.

b) Linear regression models.

c) BLUE properties of OLS estimators.

04) a) The model summary and ANOVA table details of a simple regression analysis is shown below. Answer the following questions based on the tables:

i) Interpret the R and R^2 value of the model shown here.

ii) What is the amount of variations accounted by the model and interpret about the regression and residual sums of squares of this model.

Table 1: Regression results

Model Summary

Model 1	R	R Square	Adjusted R Square
	0. 783	0.613	0.600

Predictors: (Constant), whether have social participation, amount of agricultural land, amount of credit, amount of cattle, amount of irrigated land

Table 2: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	499300000000	5	99860000000	48.397	0.000
Residual	315700000000	153	2063000000		
Total	815000000000	158			

Predictors: (Constant), whether have social participation, amount of agricultural land, amount of credit, amount of cattle, amount of irrigated land.

2

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b) The following table shows the results of multiple regression analysis to examine the effect of different independent variables on non-farm income.

Determinants of non-farm income: OLS regression results		
Independent variables	Coefficient	Sig
Distance to market	0.008	0.15
Fruits and vegetables acreage	-0.007	0.03
Attended high school (dummy)	0.129	0.02
Age	0.074	0.00
Dependency ratio	-0.164	0.00

($p < 0.05$)

i) Write down the estimated equation for the above model.

ii) Interpret the effects of each independent variable on non-farm income.

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