P.G. 1st Semester - 2018

ECONOMICS

(Basic Econometrics-I)

Paper : MECOCCT106

Full Marks : 40   Time : 2 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any **four** questions. $10×4=40$

1. Consider we have data on Y, X_1 and X_2 where y is the dependent variable. Considering three separate regressions of Y on X_1 , Y on X_2 and Y on X_1 and X_2. Derive the cases of $r_{12}=0$, $r_{12}=1$ and $r_{12}<1$ keeping in mind the term multicollinearity.   10

2. Derive the MGF for Binomial distribution and find the values of first raw moments and second central moments. $3+3+4$

3. a) Find the relation between mean, median and mode for Normal distribution.

    b) Find the values of odd order central moments for normal distribution considering the MGF of this distribution. $6+4$

4. a) In the simple linear model $y_i = \alpha + \beta x_i + u_i$ (i=1, ..., n). Suppose $E(u) = \phi(\neq 0)$. Show that the model can always be rewritten with the same slope but a new intercept and error, where the new error has a zero expected value.

    b) Suppose, using the data on total personal expenditure (X) and expenditure on durable goods(y), a researcher has obtained the following regression result:

    $$\Gamma_{xy} = -12.2 + 1.9hrX$$
    $$t = (-20.3y)(37.08)$$
    $$r^2 = 0.9612$$

    Interpret the result. $5+5$

5. Suppose, $Y_i = \beta + u_i$. Find the OLS estimator of β, Calculate the variances of β and RSS. Does the estimated β make intuitive sense.

    Now consider the regression model $Y_i = \alpha + \beta X_i + u_i I_0$, it worth adding the explanatory variable to this model. If not, why bother with regression analysis. $2+2+1+3+2$

[Turn Over]

6. Consider the following regression model:

Model 1- $\hat{C}_i = 0.0069 + 0.7582X_i$

$t = (0.2624) \quad (2.8071)$

$r^2 = 0.9612$

Model 2- $\hat{C}_i = 0.7623X_i$

$t = (2.9542)$

$r^2 = 0.4465$

What is the difference between the two regression models? How would you interpret the slope coefficients in the two models? Can you rartionalise the result that t-value of the slope coefficients in two models are different? 3+4+3

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