Exam. Code : 103206
Subject Code : 1241

B.A./B.Sc. 6th Semester

QUANTITATIVE TECHNIQUES—VI

Time Allowed—Three Hours] [Maximum Marks—100

Note :—(1) First question consisting of **10** short answer type questions (each carrying **2** marks) is compulsory.

(2) Student will attempt **1** out of **2** questions from each of the **four** units (**20** marks each).

(3) Non-scientific and Non-programmable simple calculator is allowed.

1. Attempt **all** of the following :

(a) What do you mean by econometrics ?

(b) How deterministic models are different from stochastic models ?

(c) What do you mean by random variable ?

(d) Differentiate the terms cross section and time series data.

(e) What do you mean by variance of regression parameter ?

(f) Write the formula of covariance of the parameters α and β for regression model $Y_i = \alpha + \beta X_i + U_i$.

(g) Define homoscedasticity.

(h) How auto regressive model is different from distributed lag model ?

(i) How t-test is different from F-test in regression analysis ?

(j) Give any one example of autocorrelation in macro-economic theory.

UNIT—I

2. Discuss in detail nature and scope of econometrics.

3. For classical linear regression model $Y_i = \alpha + \beta X_i + U_i$ show that :

$$\hat{\alpha} = \overline{Y} - \hat{\beta}\overline{X} \text{ and } \hat{\beta} = \frac{\sum_{i=1}^{n} x_i y_i}{\sum_{i=1}^{n} x_i^2}.$$

UNIT—II

4. Convert a multiple regression model in GLM form and write its assumptions. Show that $e'e = \sum_{i=1}^{n} e_i^2$ that represents unexplained variation. Also obtain OLS estimates of the parameters of a GLM.

5. Define R^2 and its uses. How R^2 is different from $\overline{R}^2$? Derive the formula of measuring R^2.

UNIT—III

6. What do you mean by heteroscedasticity ? Discuss the methods to detect heteroscedasticity in detail.

7. What do you mean by Multicollinearity ? How the Multicollinearity will affect the estimators of following regression parameters ?

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + U_t$$

UNIT—IV

8. Discuss the problem of Autocorrelation. Also discuss DW-test and H-test to detect the problem of autocorrelation.

9. Discuss various uses of dummy variable.