Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2022

Course: Econometrics **Semester: III**
Program: MBA IB **Time : 03 hrs.**
Course Code: ECON8001 **Max. Marks: 100**

Instructions:

SECTION A
10Qx2M=20Marks

S. No.		Marks	CO
Q 1	In a regression analysis we are concerned with the study of- (a) mean value of X population. (b) mean value of Y population. (c) dependence of Y variable on one or more explanatory variables. (d) interdependence of X and Y variables.	**2**	**CO1**
Q 2	In the simple linear regression model, the regression slope- (a) indicates by how many percent Y increases, given a one percent increase in X. (b) when multiplied with the explanatory variable will give you the predicted Y. (c) indicates by how many units Y increases, given a one unit increase in X. (d) represents the elasticity of Y on X.	**2**	**CO1**
Q 3	The fitted regression equation is given by Y = -12 + 0.5X. What is the value of residual at the point X = 50, Y = 70 ? (a) 57. (b) -57. (c) 0. (d) 33.	**2**	**CO1**
Q 4	If a quantitative variable has 'm' categories, we can introduce- (a) only 'm-1' dummy variables. (b) only 'm' dummy variables. (c) only 'm+1' dummy variables. (d) only 'm + 2' dummy variables.	**2**	**CO1**
Q 5	When our findings are statistically significant it means- (a) the 't' value and 'p' value are not equal. (b) standard error is very high. (c) the estimated value is significantly different from the hypothesized value. (d) the estimated value is not significantly different from the hypothesized value.	**2**	**CO1**
Q 6	Heteroscedasticity means that- (a) all variables cannot be assumed to be homogeneous. (b) the variance of the error term is not constant.	**2**	**CO1**

	(c) the observed units have no relation. (d) the X and Y are not correlated.		
Q 7	A non-stationary time series is one with- (a) time-varying mean. (b) time-varying variance. (c) both (a) and (b). (d) time invariant mean and variance.	**2**	**CO1**
Q 8	A non-stationary series that becomes stationary on first differencing is- (a) integrated of order 0. (b) integrated of order 1. (c) integrated of order 2. (d) integrated of order 3.	**2**	**CO1**
Q 9	Testing for cointegration is given by- (a) Dickey-Fuller test. (b) Engle-Granger test. (c) Error Correction Mechanism. (d) F-test.	**2**	**CO1**
Q 10	Multicollinearity can be detected if the regression function has- (a) high R^2 with all coefficients having t-ratios. (b) may not have high R^2 but all coefficients have high t-ratios. (c) high R^2 with very few or no coefficients having high t-ratios. (d) low R^2 with almost all coefficients having low t-ratios.	**2**	**CO1**
SECTION B **4Qx5M= 20 Marks**			
Q 11	Suppose you were to develop an Export enhancing econometric model for an exporting firm. What variables would you consider in developing such a model and why?	**4**	**CO2**
Q 12	Why do you need regression analysis? Why not simple use the mean value of the regression as its best value?	**4**	**CO2**
Q 13	What is the role of stochastic error term u_i in regression analysis? What is the difference between the stochastic error term and the residual, $\check{u}_i$?	**4**	**CO2**
Q 14	What is the error correction mechanism (ECM)? What is its relationship with cointegration?	**4**	**CO2**
SECTION-C **3Qx10M=30 Marks**			
Q 15	The following regression results were obtained between nominal exchange rate and relative prices for the period from 1980 to 1994- $\check{Y}_t = 6.682 - 4.318X_t$, $R^2 = 0.5$ Se = (1.22) (1.33) Where Y = exchange rate of the Indian rupees to the US Dollar and X = ratio of US consumer price index to the Indian consumer price index.	**10**	**CO3**

	(a) Interpret this regression. How would you interpret R^2 ? (b) Calculate t-value for coefficient of X_t and find whether is it significant at 5% or not.		
Q 16	For a sample of 210 firms, a research firm obtained the following regression results Log(salary) = 4.32 + 0.280log(sales) + 0.0174roe + 0.00024ros Se = (0.32) (0.035) (0.0041) (0.00054), R^2 = 0.283 Where salary = salary of CEO, sales = annual firm sales, roe = return on equity in percent, ros = return on firm's stock and figures in the parentheses are the estimated errors. (a) Interpret the preceding regression results. (b) Can you interpret the coefficients of 'roe' and 'ros' as elasticity coefficient? Why or why not?	**10**	**CO3**
Q 17	State with brief reason whether the following statements are true, false, or uncertain: (a) If residuals estimated from an OLS regression exhibit a systematic pattern, it means heteroscedasticity is present in the data. (b) When autocorrelation is present, OLS estimators are biased as well as inefficient. (c) Despite perfect multicollinearity, OLS estimators are BLUE.	**10**	**CO3**
SECTION-D **2Qx15M= 30 Marks**			
Q 18	From the data for the period 1971-I to 1988-IV quarter for India, the following regression results were obtained- I. $\ln M1_t = -10.2571 + 1.5975 \ln GDP_t$ t = (-12.9422) (25.8865), R^2 = 0.9463, d = 0.3265 II. $\Delta \ln M1_t = 0.0095 + 0.5833 \Delta \ln GDP_t$ t = (2.4957) (1.8958), R^2 = 0.0885, d = 1.7399 III. $\Delta \breve{u}_t = 0.1958 \breve{u}_{t-1}$ t = (-2.2521), R^2 = 0.1118, d = 1.4767 Where M1 = money supply, GDP = gross domestic product, ln = natural log and $\breve{u}_{t-1}$ = the estimated residuals from regression I. (a) Interpret regression I and II. (b) Do you suspect that regression I is spurious? Why? (c) Is regression II spurious? How do you know?	**15**	**CO4**
Q 19	Suppose you collect data from a survey on wages, education, and gender. (a) Write down a model that would allow you to test whether wages are subject to gender discrimination. Which test would you perform? Explain. (b) Suppose you can also gather data on work experience and union membership. How would you extend your model from part (a) to test that the impact of these variables on wages also differs by gender? Explain.	**15**	**CO4**