


Name:		
Enrolment No:		
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, December 2021		
Course: Time Series Econometrics		Semester: III
Program: MA Economics		Time: 03 Hours.
Course Code: ECON8014P		Max. Marks: 100
SECTION A (Objective type questions) Each question carries 2 marks.		
S. No.	Questions	CO
Q1	What is the order of the following autoregressive (AR) model? $Y_t = \alpha + \beta Y_{t-1} + \gamma Y_{t-2} + \varepsilon_t$	CO1
Q2	If the random shocks to Y_t have transitory impact, what is the time series properties of Y_t ?	CO1
Q3	If $\beta < 0$ and it is statistically significant in the regression model as given below: $\Delta Y_t = \alpha + \beta Y_{t-1} + \gamma \Delta Y_{t-1} + \varepsilon_t$, what is the order of integration of Y_t ?	CO1
Q4	If Y_t is I(1) and X_t is I(0), what is the order of integration of Z_t , where $Z_t = Y_t + X_t$?	CO1
Q5	State the properties of a stationary series.	CO1
Q6	What is autocorrelation function?	CO1
Q7	How does the ADF unit root test accounts for the autocorrelation problem.	CO1
Q8	If you find $R^2 > DW$ (where DW represents the Durbin–Watson statistic), what is the possible problem in this regression model?	CO2
Q9	What do you mean by cointegration between two series X_t and Y_t ?	CO2
Q10	How can you model the varying variance?	CO2
SECTION B (Short answer type questions) Each question carries 10 marks.		
Q11	Assume that Indian GDP series is (Y_t) is trend stationary and the optimal lag is 2. Specify the ADF unit root test regression.	CO3
Q12	Discuss the advantages and the shortcomings of vector autoregressive (VAR).model.	CO2
Q13	Explain the procedure to measure the ARCH effect through an example.	CO2
Q14	Consider the following regression results where Y_t is regressed on a constant and X_t . Both Y_t and X_t are uncorrelated I(1) processes. Interpret the results.	CO3

Variable	Coefficient	Std. error	t-statistic
C	-13.2556	0.6203	-21.3686
X	0.3376	0.0443	7.61223
$R^2 = 0.210$		$DW = 0.012$	

Section C (Marks: 10*3 = 30)		
Q15	Consider the case where you need to forecast Indian GDP for the period $t + 1$ using the Box-Jenkins methodology. Assume that the GDP series is an I(1) process. Explain the steps that you will follow.	CO4
Q16	Assume that $GDP (X_t)$ and investment (Y_t) series are I(1) and they are cointegrated. Specify the error-correction model and interpret the coefficients.	CO3
Q17	How do you statistically measure the volatility of rupee-dollar exchange rate using the ARCH(1) model? Illustrate the procedure.	CO4
Section D (Marks: 15*2 = 30)		
Q18	<p>Consider the following model:</p> $GDP_t = \sum_{i=1}^n \alpha_i M_{t-i} + \sum_{j=1}^n \beta_j GDP_{t-j} + u_{1t} \quad (1)$ $M_t = \sum_{i=1}^n \gamma_i M_{t-i} + \sum_{j=1}^n \delta_j M_{t-j} + u_{2t} \quad (2)$ <p>where GDP denotes gross domestic product and M represents money supply. It is assumed that the disturbances u_{1t} and u_{2t} are uncorrelated.</p> <p>(a) Illustrate the procedure to test the Granger causality from M to GDP.</p> <p>(b) If GDP and M are I(1) series and both are cointegrated, explain the procedure to test whether M causes GDP in the long-run.</p>	CO4