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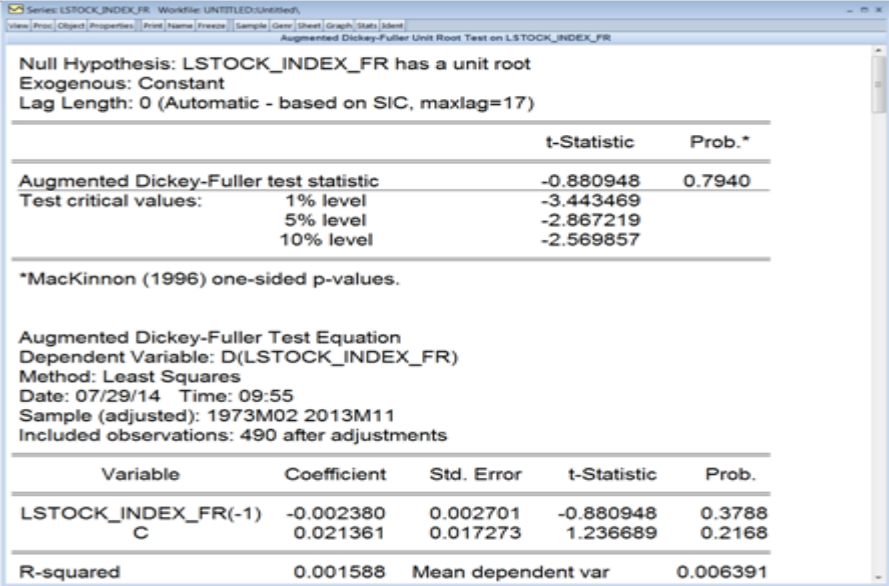
UNIVERSITY OF PETROLEUM & ENERGY STUDIES
End Semester Examination (Online) – May, 2021

Program: MA(EE)
Subject/Course: Business Modelling Lab
Course Code: OGET8112

Semester: IV
Max. Marks: 100
Duration: 3 Hours

Section-A

1. Each question will carry 5 marks
2. Select the correct answer(s)

S.No.	Question	Marks	COs
1	<p>Percapita Energy Consumption of India over the period 2000-2020 is an example of</p> <p>A. Time Series Data B. Cross-Sectional Data C. Pooled Data D. Panel Data</p>	5	CO 1
2	<p>If you want to estimate energy efficiency of Indian Manufacturing Companies, Which modelling techniques you would prefer.</p> <p>A. Data Envelopment analysis B. Input-output analysis C. Principal Component Analysis D. Panel Data Regression</p>	5	CO 1
3	 <p>You are provided the EViews output for an Augmented Dickey-Fuller (ADF)-test (below). According to the test:</p> <p>A. The null hypothesis of unit root is rejected; the variable has a stochastic trend. B. The null hypothesis of unit root is rejected at 10% significance level; the variable is</p>	5	CO 1

	stationary. C. The null hypothesis of unit root is not rejected at 1, 5 or 10% level of significance; the variable is non-stationary D. I don't know.		
4	Which can be a potential problem while we are working on forecasting a time series data. A. Non-Stationarity B. Multicollinearity C. Autocorrelation D. None of the above	5	CO 2
5	A 99% t-based confidence interval for the mean price for a gallon of gasoline (dollars) is calculated using a simple random sample of gallon gasoline prices for 50 gas stations. Given that the 99% confidence interval is $\$3.32 < \mu < \3.98 , what is the sample mean price for a gallon of gasoline (dollars)? A. \$0.33 B. \$3.65 C. Not enough Information; We would need to know the variation in the sample of gallon gasoline prices D. None of the above	5	CO 1
6	What is a spurious regression? A. Statistically significant but meaningless results generated by regression analysis of non-stationary data B. The results generated by regression analysis of a station variable dependent on a non-stationary series C. Regression analysis where endogenous and exogenous variables are reversed D. Regression analysis that is impossible due to lack of identification	5	CO 1
Section-B			
<p>1. Each question will carry 10 marks</p> <p>2. Instruction: Write short/ brief notes</p>			
7.	What are the data analytic tools available for Energy Industry?	10	CO 2
8.	If you want to model demand for Electricity Vehicle Market in India, Explain the steps for forecasting it.	10	CO 2
9.	Explain the importance big data in Energy Industry.	10	CO 2
10.	If you want to estimate factors affecting supply of renewable energy in India. What will be the econometric model for setting up the problem statement?	10	CO 3

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Give example of cross sectional data, panel data, and time series data in the context of Energy Industry. Explain the advantages and disadvantages of each data.

10

CO
3

Section-C

1. Each question carries 20 Marks.

2. Instruction: Write long answer.

Using 157 weekly observations on sales revenue (*SALES*) and advertising expenditure (*ADV*) in millions of dollars for a large department store, the following relationship was estimated

$$\widehat{SALES}_t = 18.74 + 1.006ADV_t + 3.926ADV_{t-1} + 2.372ADV_{t-2}$$

- How many degrees of freedom are there for this estimated model? (Take into account the observations lost through lagged variables.)
- Describe the relationship between sales and advertising expenditure. Include an explanation of the lagged relationship. When does advertising have its greatest impact? What is the total effect of a sustained \$1 million increase in advertising expenditure?
- The estimated covariance matrix of the coefficients is

	<i>C</i>	<i>ADV_t</i>	<i>ADV_{t-1}</i>	<i>ADV_{t-2}</i>
<i>C</i>	0.2927	-0.1545	-0.0511	-0.0999
<i>ADV_t</i>	-0.1545	0.4818	-0.3372	0.0201
<i>ADV_{t-1}</i>	-0.0511	-0.3372	0.7176	-0.3269
<i>ADV_{t-2}</i>	-0.0999	0.0201	-0.3269	0.4713

Using a two-tail test and a 5% significance level, which lag coefficients are significantly different from zero? Do your conclusions change if you use a one-tail test? Do they change if you use a 10% significance level?

- Find 95% confidence intervals for the impact multiplier, the one-period interim multiplier, and the total multiplier.

20

CO
4

12