Name: **Enrolment No:**	

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

Program: BA-H-ECO-V **Semester: V**

Subject/Course: Applied Econometrics **Max. Marks: 100**

Course Code: ECON 3012 **Duration: 3 Hours**

Instructions:

SECTION A
10Qx2M=20Marks

Q 1	BLUE stands for (i) Best Linear Unbiased Estimator. (ii) Biased Linear Unit Estimator. (iii) Bohr's Linear Unbiased Estimator. (iv) Best Linear Unit Estimator.	**2**	**CO1**
Q 2	An estimator is unbiased if (i) Its expected value is the true value of the parameter. (ii). Its expected value is not the true value of the parameter. (iii). Its unexpected value is the true value of the parameter (iv). None of the above.	**2**	**CO1**
Q 3	An estimator is consistent if (i) It converges to the true value as the sample size remains same. (ii) It converges to the true value as the sample size gets smaller. (iii) It converges to the true value as the sample size gets larger. (iv) All of the above	**2**	**CO1**
Q 4	The most used method for estimation in econometrics is (i) OLS. (ii) GLS.	**2**	

	(iii) MLE. (iv) GMM.		
Q 5	The three key ingredients of econometrics are (i) Economic theory. (ii) Economic data. (iii) Statistical method. (iv) All of the above.	**2**	**CO1**
Q 6	Which is branch of econometrics? (i) Applied Econometrics (ii) Theoretical Econometrics (iii) Both (i) and (ii) (iv) Neither (i) nor (ii)	**2**	**CO1**
Q 7	Apart from regression model, econometrics relies on (i) Null hypothesis. (ii) Data testing. (iii) Data interpretation. (iv) All the above.	**2**	**CO1**
Q 8	For bi-variate classical linear regression model, (i)R^2 greater than square of correlation coefficient. (ii) R^2 smaller than square of correlation coefficient. (iii) R^2 equals to square of correlation coefficient. (iii)None of the above.	**2**	**CO1**
Q 9	In OLS estimation, expected value of error term is (i)greater than zero (ii)less than zero (iii)Zero (iv)Any of the above	**2**	**CO1**
Q 10	R^2 is the measure of (i)% variance of the response variable has been explained by the control variable(s). (ii)% mean of the response variable has been explained by the control variable(s). (iii) % median of the response variable has been explained by the control variable(s). (iv)All of the above.	**2**	**CO1**
SECTION B **4Qx5M= 20 Marks**			
Q 1	Write down the remedial measures to remove the heteroscedasticity problem in model.	**5**	**CO2**

<table>
<tr><td>Q 2</td><td>Interpret the below regression estimations:
Dependent Variable: OUTPUT
Method: Least Squares
Sample: 1 51
Included observations: 51<table><tr><th></th><th>Coefficient</th><th>Std. Error</th><th>t-Statistic</th><th>Prob.</th></tr><tr><td>C</td><td>233621.5</td><td>1250364.</td><td>0.186843</td><td>0.8526</td></tr><tr><td>LABOR</td><td>47.98736</td><td>7.058245</td><td>6.798766</td><td>0.0000</td></tr><tr><td>CAPITAL</td><td>9.951890</td><td>0.978116</td><td>10.17455</td><td>0.0000</td></tr></table></td><td>5</td><td>CO2</td></tr>
<tr><td>Q 3</td><td>Do you think the below estimated regression model possess the heteroscedasticity problem? Explain.

Heteroskedasticity Test: Breusch–Pagan–Godfrey
F-statistic 2.823820 Prob. F(7,42) 0.0167
Obs*R-squared 16.00112 Prob. Chi-Square(7) 0.0251
Scaled explained SS 10.57563 Prob. Chi-Square(7) 0.1582

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 10/05/09 Time: 13:14
Sample: 1 50
Included observations: 50<table><tr><th></th><th>Coefficient</th><th>Std. Error</th><th>t-Statistic</th><th>Prob.</th></tr><tr><td>C</td><td>16.68558</td><td>110.1532</td><td>0.151476</td><td>0.8803</td></tr><tr><td>RELIGION</td><td>–0.134865</td><td>0.631073</td><td>–0.213707</td><td>0.8318</td></tr><tr><td>PRICE</td><td>0.286153</td><td>0.162357</td><td>1.762492</td><td>0.0853</td></tr><tr><td>LAWS</td><td>–8.566472</td><td>17.36257</td><td>–0.493387</td><td>0.6243</td></tr><tr><td>FUNDS</td><td>24.30981</td><td>20.33533</td><td>1.195447</td><td>0.2386</td></tr><tr><td>EDUC</td><td>–1.590385</td><td>1.457893</td><td>–1.090879</td><td>0.2815</td></tr><tr><td>INCOME</td><td>0.004710</td><td>0.003325</td><td>1.416266</td><td>0.1641</td></tr><tr><td>PICKET</td><td>–0.576745</td><td>0.308155</td><td>–1.871606</td><td>0.0682</td></tr></table></td><td>5</td><td>CO2</td></tr>
<tr><td>Q 4</td><td>Explain why adjusted R^2 is the better indicator of goodness of fit than R^2?</td><td>5</td><td>CO2</td></tr>
<tr><td colspan="4">SECTION-C
3Qx10M=30 Marks</td></tr>
<tr><td>Q 1</td><td>Discuss different types of regression techniques with example and proper mathematical notation.
OR

Why autocorrelation problems happen in the regression estimations? Write down different techniques to detect autocorrelation in the regression estimations?</td><td>10</td><td>CO3</td></tr>
<tr><td>Q 2</td><td>Discuss the assumptions of classical linear regression model.</td><td>10</td><td>CO3</td></tr>
<tr><td>Q 3</td><td>Explain</td><td>10</td><td>CO3</td></tr>
</table>

<table>
<tr><td></td><td>1. Total Sum Square
2. Explained Sum Square
3. Residual Sum Square</td><td></td><td></td></tr>
<tr><td colspan="4">SECTION-D
2Qx15M= 30 Marks</td></tr>
<tr><td>Q 1</td><td>Derive the β co-efficient of bi-variate cross sectional regression model.

OR

For an airline industry, the number of passengers and its operating cost has been given as follows:

<table>
<tr><th>Number of passengers
(X)</th><th>Cost ($ 1,000)
(Y)</th></tr>
<tr><td>16</td><td>5.1</td></tr>
<tr><td>20</td><td>5.2</td></tr>
<tr><td>23</td><td>5.4</td></tr>
<tr><td>29</td><td>5.8</td></tr>
<tr><td>35</td><td>5.9</td></tr>
<tr><td>42</td><td>6.1</td></tr>
</table>

Calculate β_1.</td><td>15</td><td>CO4</td></tr>
<tr><td>Q 2</td><td>Why multicollinearity problems happen in the regression estimations?
Write down different techniques to detect multicollinearity?
Write down the remedial measures to remove the multicollinearity problem in model.</td><td>15</td><td>CO3</td></tr>
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