

ECONOMETRIC METHODS AND APPLICATIONS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Recall the condition under which OLS estimators are BLUE (Gauss–Markov theorem). a) Errors are normally distributed b) Errors have zero mean, constant variance, and no autocorrelation c) Sample size is large d) Variables are logarithmic	K1	CO1
	2	Explain which assumption is violated when two regressors have a perfect linear relationship. a) Homoskedasticity b) To No autocorrelation c) No perfect multicollinearity d) To Normality	K2	CO1
2	3	Identify the effect of multicollinearity on standard errors of coefficients. a) Decrease b) Increase c) Remain Constant d) Become Zero	K1	CO2
	4	Explain the purpose of the t-statistic in hypothesis testing. a) Overall model significance b) Individual regression coefficients c) Variance equality d) Autocorrelation	K2	CO2
3	5	Recall what Durbin–Watson values close to 0 indicate a) No autocorrelation b) Negative autocorrelation c) Positive autocorrelation d) Perfect fit	K1	CO3
	6	Explain which OLS assumption is violated by autocorrelation. a) Linearity b) Independence of error terms c) Zero mean of errors d) No multicollinearity	K2	CO3
4	7	Identify the nature of OLS estimators in the presence of heteroskedasticity. a) Biased and inconsistent b) Unbiased but inefficient c) Efficient and unbiased d) Perfect	K1	CO4
	8	Interpret the concept of co-integration. a) No relationship b) Long-run relationship between variables c) Short-run fluctuation d) No variables	K2	CO4
5	9	Define stationarity in a time series. a) Mean and variance depend on time b) Mean and variance are constant over time c) Only variance changes d) Only mean changes	K1	CO5
	10	Explain how variables are modeled in a VAR model. a) Function of only its own lags b) Function of other variables only c) Function of its own lags and lags of other variables d) Independent variable	K2	CO5

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Module No.	Question No.	Question	K Level	CO										
1	11.a.	Explain the nature and scope of Econometrics.	K2	CO1										
	(OR)													
	11.b.	Discuss the assumptions of Ordinary Least Squares (OLS).												
2	12.a.	Infer the coefficient of simple linear regression. <table border="1"><tr><td>Demand</td><td>2</td><td>5</td><td>7</td><td>10</td></tr><tr><td>Price</td><td>15</td><td>13</td><td>10</td><td>5</td></tr></table>	Demand	2	5	7	10	Price	15	13	10	5	K4	CO3
	Demand	2	5	7	10									
	Price	15	13	10	5									
	(OR)													
12.b.	Examine the regression output and interpret the beta coefficient, standard error, and t-value. $\hat{y}_i = \hat{\beta}_0 + \hat{\beta}_1 X_1 + \hat{\beta}_2 X_2 + \hat{\mu}_i$ $N=10, \bar{Y} = 50, \bar{X}_1 = 5, \bar{X}_2 = 100, \sum Y = 500, \sum X_{i1} = 50, \sum X_{i2} = 1000, \sum x_1^2 = 20, \sum x_2^2 = 50000, \sum y_i^2 = 2000, \sum y_i x_{1i} = 200, \sum y_i x_{2i} = 10000, \sum x_{1i} x_{2i} = 800$													
(OR)														
3	13.a.	Make use of Concept of the Durbin-Watson Statistic and how is this Statistic Calculated?	K3	CO3										
	(OR)													
	13.b.	Inspect the detection of Heteroskedasticity in Regression Analysis.												
4	14.a.	Organize the Important of Stochastic process (Stationary & Non-stationary) in Time Series Analysis.	K3	CO4										
	(OR)													
	14.b.	Elucidate the concepts of Error Correction Mechanism (ECM).												
5	15.a.	Analysis the approaches to Econometric forecasting.	K4	CO5										
	(OR)													
	15.b.	Examine the concepts of Vector Autoregressive (VAR).												

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

All questions carry EQUAL Marks (5 × 10 = 50)																																					
Module No.	Question No.	Question	K Level	CO																																	
1	16	Explain the Methodology of Econometrics Research.	K1	CO1																																	
2	17	Estimate the overall significance of a regression model using ANOVA. Level of Significance at 5 % is $(F_{0.005}) = 3.37$ <table border="1"><tr><td>X1</td><td>32</td><td>30</td><td>35</td><td>33</td><td>35</td><td>34</td><td>29</td><td>32</td><td>36</td><td>34</td></tr><tr><td>X2</td><td>35</td><td>38</td><td>37</td><td>40</td><td>41</td><td>35</td><td>37</td><td>41</td><td>36</td><td>40</td></tr><tr><td>X3</td><td>44</td><td>46</td><td>47</td><td>47</td><td>46</td><td>43</td><td>47</td><td>45</td><td>48</td><td>47</td></tr></table>	X1	32	30	35	33	35	34	29	32	36	34	X2	35	38	37	40	41	35	37	41	36	40	X3	44	46	47	47	46	43	47	45	48	47	K5	CO2
X1	32	30	35	33	35	34	29	32	36	34																											
X2	35	38	37	40	41	35	37	41	36	40																											
X3	44	46	47	47	46	43	47	45	48	47																											
3	18	Explain the remedial measures of Heteroskedasticity.	K5	CO3																																	
4	19	Elucidate the concepts of ACF and PACF of correlogram.	K4	CO4																																	
5	20	Classify the Box Jenkins Methodology.	K4	CO5																																	

Z-Z-Z

END