Name: **Enrolment No:**	

UPES

End Semester Examination, December 2023

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

Instructions: *Answer all the questions.*

SECTION A
10Qx2M=20Marks

S. No.		Marks	CO
Q 1	In a regression analysis the values are fixed for the- (a) explanatory variables. (b) dependent variables. (c) all variables. (d) none of the variables.	**2**	**CO1**
Q 2	A statistical relationship in itself- (a) can help establish causation . (b) can help establish direction of causation. (c) cannot logically imply causation. (d) always shows correlation.	**2**	**CO1**
Q 3	In $Y_i = E(Y/X_i) + u_i$, the nonsystematic random component is- (a) Y_i. (b) $E(Y/X_i)$. (c) U_i. (d) $E(Y/X_i) + u_i$.	**2**	**CO1**
Q 4	In log-lin model, elasticity of *Y* with respect to *X* is given by- (a) β_2. (b) $\beta_2 (X/Y)$. (c) $\beta_2 X$. (d) $\beta_2 (1/Y)$.	**2**	**CO1**
Q 5	The assumption of Multicollinearity means that- (a) there should be no correlation among the regressors. (b) there should be no linear relationship among the regressors. (c) there should be no non-linear relationship among the regressors. (d) there should be no relationship among the regressors.	**2**	**CO1**
Q 6	Dummy variables are variable of the type- (a) ratio scale.	**2**	**CO1**

	(b) interval scale. (c) ordinal scale. (d) nominal scale.		
Q 7	In a multiple regression model, the adjusted R^2- (a) cannot be negative. (b) will never be greater than the regression R^2. (c) equals the square of the correlation coefficient r. (d) cannot decrease when additional explanatory variable is added.	**2**	**CO1**
Q 8	There are several reasons for serial correlation to occur in sample data. Which of these is not a reason?- (a) business cycle. (b) specification bias. (c) manipulation of data. (d) stationary data series.	**2**	**CO1**
Q 9	A white noise process is a stochastic process with - (a) zero mean. (b) constant variance. (c) serially uncorrelated error term. (d) all the above.	**2**	**CO1**
Q 10	A series that is inherently non-stationary is- (a) random walk with drift. (b) random walk without drift. (c) both (a) or (b). (d) neither (a) nor (b).	**2**	**CO1**
SECTION B **4Qx5M= 20 Marks**			
Q 11	If you have monthly data over a number of years, how many variables will you introduce to test the following hypotheses: (a) All the 12 months of the year exhibit seasonal patterns. (b) Only February, April, June, August, October, and December exhibit seasonal patterns.	**5**	**CO2**
Q 12	Explain the concept of cointegration with the help of an example.	**5**	**CO2**
Q 13	How can you detect a spurious regression?	**5**	**CO2**
Q 14	Differentiate between ratio scale, interval scale, ordinal scale, and nominal scale.	**5**	**CO2**
SECTION-C **3Qx10M= 30 Marks**			
Q 15	Consider the following regression results (*t statistics are in given in parentheses*): $\hat{Y}_i = 1286 + 104.97X_{2i} - 0.026X_{3i} + 1.20X_{4i} + 0.69X_{5i}$ ***t-test*** **= (4.67) (3.70) (−3.80) (0.24) (0.08)** $-19.47X_{6i} + 266.06X_{7i} - 118.64X_{8i} - 110.61X_{9i}$	**10**	**CO3**

	(−0.40) (6.94) (−3.04) (−6.14) **R^2 = 0.383 n = 1543** where Y = wife's annual desired hours of work, calculated as usual hours of work per year plus weeks looking for work X_2 = after-tax real average hourly earnings of wife X_3 = husband's previous year after-tax real annual earnings X_4 = wife's age in years X_5 = years of schooling completed by wife X_6 = attitude variable, 1 = if respondent felt that it was all right for a woman to work if she desired and her husband agrees, 0 = otherwise X_7 = attitude variable, 1 = if the respondent's husband favoured his wife's working, 0 = otherwise X_8 = number of children less than 6 years of age X_9 = number of children in age groups 6 to 13 (a) Do the signs of the coefficients of the various non dummy regressors make economic sense? Justify your answer. (b) How would you interpret the dummy variables, X_6 and X_7? Are these dummies statistically significant?		
Q 16	The following regression results were obtained between cigarette consumption per year *(C),* real price per pack *(P)* , and real disposable income per capita *(Y)*- ***log C = 4.30 – 1.34 log P + 0.17 log Y , Adj-R^2 = 0.5*** ***Se = (0.91) (1.33) (0.20)*** (a) What is the elasticity of demand for cigarettes with respect to price? Is it statistically significant? (b) What is the income elasticity of demand for cigarettes? Is it statistically significant? If not, what might be the reason for it?	**10**	**CO3**
Q 17	State with brief reason whether the following statements are true, false, or uncertain: (a) Even though the error term in the CLRM is not normally distributed, the OLS estimators are still unbiased. (b) In the presence of heteroscedasticity, the usual OLS method always overestimates the standard error of estimators. (c) When autocorrelation is present, OLS estimators are biased as well as inefficient.	**10**	**CO3**
SECTION-D **2Qx15M= 30 Marks**			
Q 18	A security analyst specializing in the stocks of the motion picture industry wishes to examine the relation between the number of movie theater tickets sold in December and the annual level of earnings in the motion picture industry. Time-series data for the last 15 years are used to estimate the regression model- ***E = a + bN***	**15**	**CO4**

	where *E* is total earnings of the motion picture industry measured in dollars per year and N is the number of tickets sold in December. The regression output is as follows: ***DEPENDENT VARIABLE: E*** ***R-SQUARE*** ***F-RATIO*** ***P-VALUE*** ***OBSERVATIONS: 15*** ***0.8311*** ***63.96*** ***0.0001*** ***VARIABLE*** ***PARAMETER ESTIMATE*** ***STANDARD ERROR*** ***T-RATIO*** ***P-VALUE*** ***INTERCEPT*** ***25042000.0*** ***20131000.0*** ***1.24*** ***0.2369*** ***N*** ***32.31*** ***8.54*** ***3.78*** ***0.0023*** (a) How well do movie ticket sales in December explain the level of earnings for the entire year? Present statistical evidence to support your answer. (b) On average, what effect does a 100,000-ticket increase in December sales have on the annual earnings in the movie industry? (c) Sales of movie tickets in December are expected to be approximately 950,000. According to this regression analysis, what do you expect earnings for the year to be?		
Q 19	Explain the mechanism of Error Correction Model (ECM) with the help of an example and equations. Mention where we can apply ECM.	**15**	**CO4**