

# JAIPURIA INSTITUTE OF MANAGEMENT, NOIDA

# PGDM / PGDM (M) / PGDM (SM)

# IV<sup>th</sup> TRIMESTER (Batch\_2021)

#### END TERM EXAMINATIONS

Course Name	Business Forecasting	Course Code	OM401
Max. Time	2 hours	Max. Marks	40 MM

#### INSTRUCTIONS: Open Book Exam

Attempt all questions

Table 1

Solve the questions in eviews software and attempt the questions asked below each datasets provided in excel.

1. Table 1 gives data on the civilian unemployment rate Y (%) and manufacturing hourly compensation in US dollars X (index, 1992=100) for India, USA, and Bangladesh for the period of 1980-1999.

Each question carries 20 marks

	India		USA		Bangladesh	
Observati	Compensati	Unemploym	Compensat	Unemploym	Compensati	Unemploym
ons	on, \$/hour	ent rate (%)	ion \$/hour	ent rate (%)	on, \$/hour	ent rate (%)
1980	55.6	7.1	49	7.2	43.7	7
1981	61.1	7.6	54.1	7.3	44.1	10.5
1982	67	9.7	59.6	10.6	42.2	11.3
1983	68.8	9.6	63.9	11.5	39	11.8
1984	71.2	7.5	64.3	10.9	37.2	11.7
1985	75.1	7.2	63.5	10.2	39	11.2
1986	78.5	7	63.3	9.2	47.8	11.2
1987	80.7	6.2	88	8.4	60.2	10.3
1988	84	5.5	76	7.3	68.3	8.6
1989	86.6	5.3	84.1	7	67.7	7.2
1990	90.8	5.6	91.5	7.7	81.7	6.9
1991	95.6	6.8	100.1	9.8	90.5	6.8
1992	100	7.5	100	10.6	100	8.8
1993	102.7	6.9	95.5	10.7	88.7	10.1
1994	105.6	6.1	91.7	9.4	92.3	10.5
1995	107.9	5.6	93.3	8.5	95.9	9.7
1996	109.3	5.4	93.1	8.7	95.6	8.7
1997	111.4	4.9	94.4	8.2	103.3	7
1998	117.3	4.5	90.6	7.5	109.8	6.3
1999	123.2	4	91.9	5.7	112.2	6.1

a) A priori identify the relationship between X and Y. List reasons for the same. (2 marks)

b) Discuss the assumptions of OLS model. (2 marks)

c) Apply linear regression and estimate the model for each country. (3 marks)

d) Analyze and interpret the results derived in the above step. (3 marks)

e) Identify the problem in the residuals (if any). (3 marks)

f) Develop a model after pooling all 60 observations. Formulate the new equations. (4 marks)

g) Compare FEM with REM model. Select the appropriate model? Justify your answer. (3 marks)

Year	Per capita	Real	Real retail	Retail price of	Retail price of	Weighted			
	consumption	disposable	price of atta	rice per lb	millet per lb	average retail			
	of atta lb (Y)	income per	per lb (X3)	(X4)	(X5)	price of atta			
		capita (X2)				substitutes			
	1					per lb (X6)			
1960	27.8	397.5	42.2	50.7	78.3	65.8			
1961	29.9	413.3	38.1	52.0	79.2	66.9			
1962	29.8	439.2	40.3	54.0	79.2	67.8			
1963	30.8	459.7	39.5	55.3	79.2	69.6			
1964	31.2	492.9	37.3	54.7	77.4	68.7			
1965	33.3	528.6	38.1	63.7	80.2	73.6			
1966	35.6	560.3	39.3	69.8	80.4	76.3			
1967	36.4	624.6	37.8	65.9	83.9	77.2			
1968	36.7	666.4	38.4	64.5	85.5	78.1			
1969	38.4	717.8	40.1	70.0	93.7	84.7			
1970	40.4	768.2	38.6	73.2	106.1	93.3			
1971	40.3	843.3	39.8	67.8	104.8	89.7			
1972	41.8	911.6	39.7	79.1	114.0	100.7			
1973	40.4	931.1	52.1	95.4	124.1	113.5			
1974	40.7	1,021.5	48.9	94.2	127.6	115.3			
1975	40.1	1,165.9	58.3	123.5	142.9	136.7			
1976	42.7	1,349.6	57.9	129.9	143.6	139.2			
1977	44.1	1,449.4	56.5	117.6	139.2	132.0			
1978	46.7	1,575.5	63.7	130.9	165.5	132.1			
1979	50.6	1,759.1	61.6	129.8	203.3	154.4			
1980	50.1	1,994.2	58.9	128.0	219.6	174.9			
1981	51.7	2,258.1	66.4	141.0	221.6	180.8			
1982	52.9	2,478.7	70.4	168.2	232.6	189.4			

2. Consider the demand function  $Y = \beta_1 X_2^{\beta_2} X_3^{\beta_3} X_4^{\beta_4} X_5^{\beta_5}$  for the following data.

a. Transform the equation to a linear form. (2 mark)

- b. Estimate the regression coefficients of the transformed equation. (3 marks)
- Would you reject the hypothesis that there is no correlation between Y and any of the X variables? Defend your action. (3 marks)
- d. Now consider the demand function,  $Y = \beta 1 X_2^{\beta 2} X_3^{\beta 3} X_6^{\beta 6}$ . *Reconstruct* and *Estimate* the new regression equation (no need to provide the interval estimates). (4 marks)
- e. Would you choose this equation or the earlier one? (4 marks)
- f. *Test* for autocorrelation in the equation you selected. *Suggest* the ways to remove it (if present). (4 marks)