

**JAIPURIA INSTITUTE OF MANAGEMENT, NOIDA**  
**PGDM (M) VI TRIMESTER (Batch 2017-19)**  
**END TERM EXAMINATION**  
**SET - 1**

<b>Course Name</b>	<b>MARKETING ANALYTICS</b>	<b>Course Code</b>	<b>MKT 305</b>
<b>Max. Time</b>	<b>2 HOURS</b>	<b>Max. Marks</b>	<b>40</b>

**INSTRUCTIONS:** All questions are compulsory

- Customer Demographics include “gender, race, age, income, disabilities, mobility (in terms of travel time to work or number of vehicles available), educational attainment, home ownership, employment status, and even location.” These types of classifications can help marketers in targeting the right kind of customers. The competition in Indian automobile market is getting fierce every day. Mazda is planning to enter Indian market and has hired you as a marketing consultant. You have collected and analysed data. The following table shows output from a multiple regression model for sales including sex, education, number of children, year respectively in Indian market.

**Table 1**

	<b>Coefficients</b>	<b>p-value (2-tailed)</b>
a (constant)	23.67	<.01
female	-0.58	<.01
low	reference	
middle	-0.7	<.01
high	-1.42	<.01
no children	reference	
1 child	0.97	<.01
2 children	0.64	<.01
3 children	0.83	<.01
4 children or more	0.9	
2000	reference	0.01
2010	0.21	0.16
2018	0.4	0.02

- What recommendations would you make to Mazda for Indian market (refer table 1).

**(7 marks)**

In addition, the equation for main and interaction effects was obtained as follows:

$$\text{Mean (BMI)} = a + b_1 * \text{female} + b_2 * \text{middle} + b_3 * \text{high} + b_4 * \text{one child} + b_5 * \text{two children} + b_6 * \text{three children} + b_7 * \text{four or more children} + b_8 * 2010 + b_9 * 2018 + b_{10} * \text{female} * \text{middle} + b_{11} * \text{female} * \text{high} + b_{12} * \text{female} * \text{one child} + b_{13} * \text{female} * \text{two children} + b_{14} * \text{female} * \text{three children} + b_{15} * \text{female} * \text{four or more children}$$

The values of a & b's are given as follows:

a	b1	b2	b3	b4	b5	b6	b7
23.36	14	-0.45	-1.07	1.2	0.78	1.03	1.09

b8	b9	b10	b11	b12	b13	b14	b15
0.21	0.39	-0.52	-0.72	-0.5	-0.29	-0.39	-0.4

b. Interpret this equation to help Mazda for launching new brands in Indian market. (8 marks)

2. A marketing analytics consultancy firm conducted a study for a herbal toothpaste manufacturing company and found that the sales of the company depends linearly on number of salespersons, money spent on advertising, number of retail outlets, product varieties offered, number of competitors and number of customers. On regression analysis, the following results were obtained

ANOVA			
	<i>Df</i>	<i>SS</i>	<i>Significance F</i>
Regression	6.000	.6399.194	0.000
Residual	8.000	323.206	
Total	14.000	6722.400	

  

	<i>Coefficients</i>	<i>Standard Error</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-0.003	31.103	-71.728	71.721
Salespersons	1.026	0.927	-1.111	3.163
advertising amount	0.875	1.274	-2.063	3.812
Variety	1.532	0.602	0.144	2.920
Competitors	-1.490	2.169	-6.491	3.511
retail outlets	0.247	2.245	-4.930	5.424
Customers	0.172	0.270	-0.452	0.795

  

<i>Observation</i>	<i>Predicted Y</i>	<i>Residuals</i>
1.000	74.191	6.809
2.000	25.080	-2.080
3.000	23.458	-5.458
4.000	4.177	3.823
5.000	15.731	0.269
6.000	-0.680	4.680
7.000	24.175	4.825
8.000	25.964	-3.964
9.000	25.246	-10.246
10.000	3.580	2.420
11.000	42.145	2.855
12.000	11.541	-0.541
13.000	25.763	-5.763
14.000	61.246	-1.246
15.000	1.382	3.618

Suggest an appropriate marketing strategy for the company based upon this data analysis.  
(9 Marks)

#### CASE STUDY

A forecast of total-market demand won't guarantee a successful strategy. By gauging market demand explicitly, marketing managers have a better chance of controlling their company's destiny by devising an effective strategy. Market forecasting is only the first stage in creating such strategy for Cadila. Cadila was founded in 1952 by Ramanbhai Patel (1925–2001), formerly a lecturer in the L.M. College of Pharmacy, and his business partner Indravadan Modi. It evolved over the next four decades into an established pharmaceutical company. In 1995 the Patel and Modi families split, with the Modi family's share being moved into a new company called Cadila Pharmaceuticals Ltd. and Cadila Healthcare became the Patel family's holding company. In 2015 the company acquired another Indian pharmaceutical company called German Remedies. In 2010, Cadila Healthcare received a Wellcome Trust Award under the "R&D for Affordable Healthcare in India" initiative. From nine pharmaceutical production operations in India as well as a Zydus Cadila develops and manufactures a large range of pharmaceuticals as well as diagnostics, herbal products, skin care products and other OTC products. Starting from late 2015, having concluded a voluntary license agreement with Gilead, the company also produces the generics for hepatitis C treatment (i.e. sofosbivur, distributed under the brand name SoviHep). The company makes active pharmaceutical ingredients at three sites in India:

Cadila is interested in forecasting the impact of sales representatives and territories on its sales.

	Rep 1	Rep 2	Rep 3	Rep 4
Dist 1	1	3	10	12
Dist 2	17	12	16	14
Dist 3	17	21	22	25
Dist 4	20	10	17	23
Dist 5	22	21	37	32

By analyzing the past data as shown above, the following results were obtained

ANOVA					
Source of Variation	SS	df	MS	F	P-value
Rows	1011.3	4	252.825	15.87598	9.74E-05
Columns	216.4	3	72.13333	4.529566	0.024095
Error	191.1	12	15.925		
Total	1418.8	19			

Q.3

- Predict the sales for representative 2 & district 4, representative 1 & district 3, representative 3 & district 1.
- What will be predicted sales in part a of this question. if p value of rows is 0.87
- What will be predicted sales in part a of this question, if p value of columns is 0.76
- What will be different predicted sales intervals at different levels. **(2X4= 8 marks)**

Q.4 To understand the impact of advertising and price on sales more comprehensively, the company analysed the past data shown below.

		Price		
		Low	Medium	High
Adv	Low	41	21	10
		25	20	11
		23	16	8
	Medium	28	28	11
		30	22	22
		32	18	18
	High	35	26	21
		45	40	26
		47	32	20

The following results were obtained.

ANOVA					
Source of Variation	SS	df	MS	F	P-value
Sample	804.962963	2	402.481	13.52	0.0003
Columns	1405.407407	2	702.704	23.6	9E-06
Interaction	50.59259259	4	12.6481	0.425	0.7888
Within	536	18	29.7778		
Total	2796.962963	26			

- Predict the sales if price is high and advertising is medium.
  - Discuss the different predicted sales intervals for different levels. **(2X2= 4 marks)**
- However, there was another past data set was available with the company as shown below.

		Price		
		Low	Medium	High
Adv	Low	41	21	15
		25	20	14
		23	16	13
	Medium	28	28	14
		30	22	13
		32	18	12
	High	50	34	13
		51	40	13
		52	32	13

The analysis of this data yielded following results.

ANOVA							
Source of Variation	SS	Df	MS	F	P-value	F crit	
Sample	828.963	2	414.48	24.22	7.86E-06	3.55456	
Columns	2498.74	2	1249.4	73.02	2.31E-09	3.55456	
Interaction	509.926	4	127.48	7.45	0.001006	2.92775	
Within	308	18	17.111				
Total	4145.63	26					

- Predict the sales if price is high and advertising is medium.
- Discuss the different predicted sales intervals for different levels. **(2X2= 4 marks)**