



Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2022

Course: Demand Planning and Forecasting

Program: BBA LM

Course Code: LSCM 2008

Semester: IV

Time : 03 hrs.

Max. Marks: 100

Instructions:

SECTION A
10Qx2M=20Marks

S. No.		Marks	CO
Q 1	ETO stands for _____.	2 Marks	CO1
Q 2	ORACLE stands for _____.	2 Marks	CO1
Q 3	SAP stands for _____.	2 Marks	CO1
Q 4	CFE stands for _____ used to measure the forecast accuracy.	2 Marks	CO1
Q 5	Which forecasting model employs numerical information and are objective by nature?	2 Marks	CO1
Q 6	In the Linear Regression Equation i.e. $Y = a + bX$, where 'a' is known as _____ and 'b' is known as _____.	2 Marks	CO1
Q 7	ARIMA stands for _____.	2 Marks	CO1
Q 8	Causal Model is also known as Association Modelling. <i>True/False?</i>	2 Marks	CO1
Q 9	Smoothing coefficient is also known as weighted average method. <i>True/False?</i>	2 Marks	CO1
Q 10	MAPD stands for Measuring Absolute Percent Derivation. <i>True/False?</i>	2 Marks	CO1

SECTION B
4Qx5M= 20 Marks

Q 11	<p>Consider, if the actual sales for a product in January 2022 is 2728 units, then how much will be the forecast demand for the month February 2022? Apply Naïve approach.</p> <p align="center">OR</p> <p>PITU company using simple exponential smoothing using smoothing constant of 0.2 to forecast its short-term demand. The forecast for the month of July was 500 units whereas the actual sales was only 450 units. What is the forecast for the month of August?</p>	5 Marks	CO2
Q 12	From the below statement, discuss the type of forecast and its time horizon in your own words.	5 Marks	CO2

	<p>Consider a topic “electric vehicles”, what would be the future in India. (Example: Future of money, future of learning, future of religion, etc.). Make a quick forecast: How might this topic be different in the future, if electric vehicle become more commonplace? Just share some possibilities.</p> <p style="text-align: center;">OR</p> <p>How dependent demand is different from independent demand? Give examples to support your answer.</p>		
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Q 13	What are the precautions should be consider in administering the Delphi technique?	5 Marks	CO2
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Q 14	<p>Demand for patient surgery at a hospital has increased steadily in the past few years, as seen in the following table:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Year</td> <td style="width: 5%;">1</td> <td style="width: 5%;">2</td> <td style="width: 5%;">3</td> <td style="width: 5%;">4</td> <td style="width: 5%;">5</td> <td style="width: 5%;">6</td> </tr> <tr> <td>Outpatient Surgeries Performed</td> <td>45</td> <td>50</td> <td>52</td> <td>56</td> <td>58</td> <td>?</td> </tr> </table> <p>The director of medical services predicted six years ago that demand in year 1 would be 42 surgeries. Using exponential smoothing with a weight $\alpha = 0.20$, develop forecasts for years 2 through 6. What is the MAD?</p>	Year	1	2	3	4	5	6	Outpatient Surgeries Performed	45	50	52	56	58	?	5 Marks	CO2
Year	1	2	3	4	5	6											
Outpatient Surgeries Performed	45	50	52	56	58	?											

SECTION-C
3Qx10M=30 Marks

Q 15	<p>Data collected on the yearly demand for 50 pounds bags of fertilizer at TTT Pesticides Company as shown in the following table:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Year</td> <td style="width: 3%;">1</td> <td style="width: 3%;">2</td> <td style="width: 3%;">3</td> <td style="width: 3%;">4</td> <td style="width: 3%;">5</td> <td style="width: 3%;">6</td> <td style="width: 3%;">7</td> <td style="width: 3%;">8</td> <td style="width: 3%;">9</td> <td style="width: 3%;">10</td> <td style="width: 3%;">11</td> </tr> <tr> <td>Demand for fertilizer bags (in thousands)</td> <td>4</td> <td>6</td> <td>4</td> <td>5</td> <td>10</td> <td>8</td> <td>7</td> <td>9</td> <td>12</td> <td>14</td> <td>15</td> </tr> </table> <p>Develop a three-year moving average to forecast sales. Then estimate demand again with a weighted moving average in which sales in the most recent year as given a weight of 2 and sales in the other two years are each given a weight of 1. Which method do you think is best?</p>	Year	1	2	3	4	5	6	7	8	9	10	11	Demand for fertilizer bags (in thousands)	4	6	4	5	10	8	7	9	12	14	15	10 Marks	CO3
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Q 16	<p>Mr X has come up with the following forecasting model for the number of admissions to his alma mater ABC School of Business in North India:</p> $Z = 290 + [360(Y / 100)^{0.5} / \{1 + \log_{10}(C)\}]$ <p>Where, Z = number of new students getting admitted Y = percentage of graduating students placed in the current year C = number of business schools in the city</p> <p>(a) What will be Mr X forecast for admissions this year of 90 percent</p>	10 Marks	CO3
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	<p>of the graduating students have been placed and the business schools in the city number 11?</p> <p>(b) What will it be if only 40 percent have been placed and the business schools in the city are 23?</p> <p>(c) What will it be if the placements are 100 percent and the number of business schools in the city are 30?</p> <p>(d) What may be the maximum possible number of students getting admitted to Mr X alma mater, as long as this forecast model holds good?</p>		
Q 17	What role does forecasting play in the supply chain of Indigo paints and Asian paints including push and pull view. Do comparative analysis for both paint companies. Which company is doing collaborative forecasting and why? Give your viewpoint.	10 Marks	CO3

SECTION-D
2Qx15M= 30 Marks

Q 18	<p>Central Call Centre (CCC) wishes to forecast the number of incoming calls it receives in a day from the customers of one of its clients, BMI. CCC schedules the appropriate number of telephone operators based on projected call volumes. With the help of 3 days moving average (3DMA) method and exponential smoothing ($\alpha = 0.25$), the near future call volumes for all days as given in Table 1 respectively.</p> <p style="text-align: center;">Table 1</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Days</th> <th style="text-align: center;">Calls</th> <th style="text-align: center;">Forecast Calls (3DMA)</th> <th style="text-align: center;">Forecast Calls ($\alpha = 0.25$)</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">1</td><td style="text-align: center;">159</td><td style="text-align: center;">177.3</td><td style="text-align: center;">174.1</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">217</td><td style="text-align: center;">190.2</td><td style="text-align: center;">186.4</td></tr> <tr><td style="text-align: center;">3</td><td style="text-align: center;">186</td><td style="text-align: center;">189.7</td><td style="text-align: center;">185.9</td></tr> <tr><td style="text-align: center;">4</td><td style="text-align: center;">161</td><td style="text-align: center;">187.3</td><td style="text-align: center;">186</td></tr> <tr><td style="text-align: center;">5</td><td style="text-align: center;">173</td><td style="text-align: center;">188</td><td style="text-align: center;">179.8</td></tr> <tr><td style="text-align: center;">6</td><td style="text-align: center;">157</td><td style="text-align: center;">173.3</td><td style="text-align: center;">178.1</td></tr> <tr><td style="text-align: center;">7</td><td style="text-align: center;">203</td><td style="text-align: center;">163.7</td><td style="text-align: center;">172.8</td></tr> <tr><td style="text-align: center;">8</td><td style="text-align: center;">195</td><td style="text-align: center;">177.7</td><td style="text-align: center;">180.4</td></tr> <tr><td style="text-align: center;">9</td><td style="text-align: center;">188</td><td style="text-align: center;">185</td><td style="text-align: center;">184</td></tr> <tr><td style="text-align: center;">10</td><td style="text-align: center;">168</td><td style="text-align: center;">195.3</td><td style="text-align: center;">185</td></tr> <tr><td style="text-align: center;">11</td><td style="text-align: center;">198</td><td style="text-align: center;">183.7</td><td style="text-align: center;">180.8</td></tr> </tbody> </table>	Days	Calls	Forecast Calls (3DMA)	Forecast Calls ($\alpha = 0.25$)	1	159	177.3	174.1	2	217	190.2	186.4	3	186	189.7	185.9	4	161	187.3	186	5	173	188	179.8	6	157	173.3	178.1	7	203	163.7	172.8	8	195	177.7	180.4	9	188	185	184	10	168	195.3	185	11	198	183.7	180.8	15 Marks	CO4
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	<p>(a) With the help of formula, calculate the forecast error for both 3DMA and exponential smoothing ($\alpha = 0.25$)?</p> <p>(b) Which forecasting method (3DMA or $\alpha = 0.25$) is preferred, based on the MAD over the most recent 9 days?</p>																															
Q 19	<p>A manufacturer of tricycles for children in the age group of two to four years commissioned a market research firm to understand the factors that influenced the demand for its product. After some detailed studies, the market research firm concluded that the demand was a simple linear function of the number of newly married couples in the city. Based on this assumption, build a causal model for forecasting the demand for the product using the data given below in Table 2 collected for a residential area in a city. Also, estimate the demand for tricycles if the number of new marriages is 150 and 250.</p>				<p>15 Marks</p> <p>CO4</p>																											
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