UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2019

Program: MBA LSCM
Semester – II
Subject (Course): Demand Planning and Forecasting   **Max. Marks   : 100**
Course Code   : LSCM-7009   **Duration   : 3 Hrs**
No. of page/s: 3

SECTION A (Attempt all)		
Q1.		**[10x2 = 20 marks]**
(a) What is tracking signal?	2	CO2
(b) What is information?	2	CO1
(c) SPSS is one of the statistical packages used for forecasting. True/ False?	2	CO3
(d) What is demand forecasting?	2	CO4
(e) ATP stands for _____.	2	CO4
(f) Write the formula for MAPD.	2	CO2
(g) Time Flexibility and Level strategy are same in nature and belongs to one of the type of aggregate planning strategy. *True/False?*	2	CO3
(h) Forecasting is essentially the study of internal and external forces that shape demand and supply. *True/ False?*	2	CO1
(i) Single independent variable is used to predict the values of a dependent variable is known as multiple regression method. True/False?	2	CO2
(j) The range of weighting factor in simple exponential smoothing lies between ___ to ___.	2	CO2
SECTION B (Attempt any four)	**[4x5 = 20 marks]**	
Q2. *"IIT researchers claim their earthquake warning system can alert people before disaster strikes in Uttarakhand (Dehradun) and New Delhi".* How forecasting can support and detect the quake. Give your opinion.	5	CO1
Q3. What is the role of tactical decision in forecasting time horizon? Give some implications and examples.	3+1+1	CO2
Q4. What role does forecasting play in the supply chain of paint industry including push and pull view. Whether this industry is doing collaborative forecasting or not? Give your comments. **OR** **Q4.** *"Forecast error increases as the distance from customer increases".* Consider this statement explain the concept of Bullwhip effect in the supply chain of paint industry.	5	CO3, CO4

Q5. What is the difference between interactive forecasting and repetitive forecasting? Support with examples.	5	CO1
Q6. What are the components of time series analysis? Represent in graphs.	5	CO2
SECTION C (Attempt all)	**[3x10 = 30 marks]**	
Q7. What are the steps involved in developing the forecasting logic? Also, draw the flowchart of forecasting hierarchy.	6+4	CO1, CO2

Q8. Sadia Syed has come up with the following forecasting model for the number of admissions to her *alma mater* Barkat School of Business in Lucknow:
 	
 $$Z = 190 + [360 \ (Y \ / \ 100)^{0.5} \ / \ \{1 + \log_{10} (C)\} \ ]$$
 	
 Where, Z is the number of new students getting admitted
       Y is the percentage of graduating students placed in the current year
       C is the number of business schools in the city
 	
 (a) What will be Sadia's forecast for admissions this year if 90 percent of the graduating students have been placed and the business schools in the city number 11?
 (b) What will it be if only 40 percent of the graduating students have been placed and the business schools in the city are 23?
 (c) What will it be if the placements are 100 percent and the number of business schools in the city are 30?
 (a) What may be the maximum possible number of students getting admitted to Sadia's alma mater when the placements are 100 percent and the Barkat School of Business is the only business school in the Lucknow city?
	10	CO2, CO4

Q9. **(a)** RUBU company predicted the sales for a product as 150 units for February 2019. The actual demand for February 2019 was 158 units. Using a smoothing constant of 0.3, forecast the demand for March 2019. **(b)** What is the difference between the symbol *"r"* and *"r-squared"* in regression method?	5+5	CO2, CO3
SECTION D (Compulsory)	**[2x15 = 30 marks]**	
Q10. A manufacturer of critical components for two wheelers in the automotive sector is interested in forecasting the trend of demand during the next year as a key input to its annual planning exercise. Information on the past sales is available for the last three years. Extract the trend component of the time series data and use it for predicting the future demand of the components. Also, calculate the seasonality index in all four quarters.	15	CO2, CO4

Year	1				2				3			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Actual Demand (in thousands of units)	360	438	359	406	393	365	387	464	505	618	443	540

Q11. Room registrations in the Park Hotel recorded for the past nine years. Management would like to determine the mathematical trend of guest registration in order to project future occupancy. This estimate would help the hotel determine whether a future expansion will be needed. Given the following time series data, develop a regression equation relating registrations to time. Then forecast year 11's registration. Room registrations are in thousands. Year 1 : 17, Year 2 : 16, Year 3 : 16, Year 4 : 21, Year 5 : 20, Year 6 : 20, year 7 : 23, Year 8 : 25, Year 9 : 24. **OR** **Q11.** A firms sales for a product line during the 12 quarters of the past three years were as follows: | Quarter	1	2	3	4	5	6	7	8	9	10	11	12 | |---|---|---|---|---|---|---|---|---|---|---|---|---| | Sales | 600 | 1550 | 1500 | 1500 | 2400 | 3100 | 2600 | 2900 | 3800 | 4500 | 4000 | 4900 | Forecast the sales for the 13th, 14th, 15th and 16th quarters, **(a)** By using a hand-fitted linear regression equation, whose intercept value is 400 and slope of the line is 382, and **(b)** By using least square method from the above table. **(c)** Compare the forecasted values from 13th to 16th quarters for both methods.	15	CO2, CO3

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SECTION A (Attempt all)		
Q1.	**[10x2 = 20 marks]**	
(b) What is the relation between tracking signal and MAD?	2	CO2
(b) Explain the term "information"?	2	CO1
(c) LOGWARE is one of the statistical packages used for forecasting. True/ False?	2	CO3
(d) What is demand forecasting?	2	CO4
(e) ATP stands for _____.	2	CO4
(f) Write the formula for MAPD.	2	CO2
(g) Chase and Level strategy are same in nature and belongs to one of the type of aggregate planning strategy. *True/False?*	2	CO3
(h) Forecasting is essentially the study of internal and external forces that shape demand and supply. *True/ False?*	2	CO1
(i) Single independent variable is used to predict the values of a dependent variable is known as multiple regression method. True/False?	2	CO2
(j) What is the range of weighting factor in simple exponential smoothing?	2	CO2
SECTION B (Attempt any four)	**[4x5 = 20 marks]**	
Q2. The forecasters looks for data patterns as: *Data = Historic Pattern + Random Variation* What are the types of "*Historic pattern*" to be forecasted by the forecasters? Explain with the use of graphs and examples. Also, define the term *"Random Variation/Movements"* with an example.	5	CO2
Q3. What is the role of tactical decision in forecasting time horizon? Give some implications and examples.	3+1+1	CO2
Q4. *"Forecast error increases as the distance from customer increases"*. Consider this statement explain the concept of Bullwhip effect in the supply chain of paint industry.	5	CO4

Q5. What is the difference between interactive forecasting and repetitive forecasting? Support with examples.	5	CO1
Q6. *"XYZ institutes claim their earthquake warning system can alert people before disaster strikes in Uttarakhand (Dehradun) and New Delhi".* How forecasting can support and detect the quake. Give your opinion..	5	CO1
SECTION C (Attempt all)	**[3x10 = 30 marks]**	
Q7. What are the steps involved in developing the forecasting logic? Also, draw the flowchart of forecasting hierarchy.	6+4	CO1, CO2
Q8. What is the difference between the symbol *"r"* and *"r-squared"* in regression method?	5+5	CO4
Q9. OM company predicted the sales for a product as 150 units for February 2019. The actual demand for February 2019 was 158 units. Using a smoothing constant of 0.3, forecast the demand for March 2019.	10	CO2
SECTION D (Compulsory)	**[2x15 = 30 marks]**	
Q10. A firms sales for a product line during the 12 quarters of the past three years were as follows: Forecast the sales for the 13th, 14th, 15th and 16th quarters, **(a)** By using a hand-fitted linear regression equation, whose intercept value is 400 and slope of the line is 382, and **(b)** By using least square method from the above table. **(c)** Compare the forecasted values from 13th to 16th quarters for both methods.	10+15+5	CO2, CO3

Q10 embedded table:

Quarter	1	2	3	4	5	6	7	8	9	10	11	12
Sales	600	1550	1500	1500	2400	3100	2600	2900	3800	4500	4000	4900