Name:	
Enrolment No:	

Course	:	**Demand Planning and Forecasting**
Program	:	**MBA LSCM**
Course Code	:	**LSCM 7009**

Semester : II
Time : 03 hrs.
Max. Marks : 100

Instructions:
1. The student must write his/her name and enrolment no. in the space designated above.
2. It is a Closed-Book Exam.
3. Students can use calculators to answer the numerical.
4. Laptops, Smartwatch and Mobile phones are not allowed during the exam.

SECTION A
10Qx2M=20Marks

S. No.		Marks	CO
Q 1	Which situation demonstrates the inappropriate use of a long-term forecast in a short product lifecycle industry? a) Forecasting seasonal apparel sales 2 years in advance b) Estimating electric vehicle demand over the next decade c) Predicting aviation fuel consumption trends d) Planning airline routes based on past 10 years of demand	2	CO1
Q 2	A multinational firm is choosing between CPFR and traditional forecasting for its global distribution centers. What key advantage should drive the adoption of CPFR? a) Simpler technology integration b) Reduced need for collaboration c) Increased reliance on intuition d) Improved alignment between supply chain partners	2	CO1
Q 3	The sales for a product over three weeks are 300, 320, and 310 units. Using a 3-period Simple Moving Average, what is the forecast for the 4th week? a) 310 b) 315 c) 312 d) 320	2	CO2
Q 4	A time series shows a consistent upward trend and seasonal fluctuations. Which forecasting method would be the most suitable? a) Simple average b) Naïve method c) Holt-Winters model d) Moving average	2	CO2

Q 5	Which statements best describe the advantages of exponential smoothing over moving average techniques? *(Multiple correct options possible)* a) Requires less historical data b) Adapts faster to recent changes c) Gives equal weight to all past data d) Simple to use and implement e) Useful only for seasonal data	2	CO2
Q 6	A luxury hotel chain uses customer focus groups to predict future demand for premium services. This is an example of which type of forecasting method? a) Quantitative b) Delphi c) Sales force composite d) Consumer survey	2	CO3
Q 7	What is the primary risk when relying solely on expert opinion in qualitative forecasting without a structured feedback mechanism? a) High data processing costs b) Lack of subjective judgment c) Potential for bias and inconsistency d) Overdependence on technology	2	CO3
Q 8	An organization integrates both regression analysis and Delphi technique to forecast demand. What is the likely benefit of this hybrid approach? a) Increased simplicity b) Elimination of uncertainty c) Improved forecast accuracy through triangulation d) Reduction in time taken	2	CO3
Q 9	A manufacturing firm faces fluctuating customer demand and wants to maintain low inventory levels. Which aggregate planning strategy is most aligned with this objective? a) Level strategy b) Time-based strategy c) Chase strategy d) Fixed inventory strategy	2	CO4
Q 10	A tech firm is designing its demand plan for a new wearable device. Which combination of actions would best reflect an agile and responsive demand planning system? a) Rely solely on historical data and apply a fixed lead time b) Integrate customer feedback, monitor social media trends, and use short-term rolling forecasts c) Apply regression forecasting annually and stick to one vendor d) Focus only on upstream supply data	2	CO4

	SECTION B 4Qx5M= 20 Marks		
Q 11	Discuss how Collaborative Planning, Forecasting, and Replenishment (CPFR) can be used to improve forecast accuracy in a retail supply chain. What are the key challenges in implementing CPFR?	5	CO1
Q 12	Evaluate the suitability of the Holt's Linear Trend Model for forecasting sales of a product experiencing steady growth. What are the critical assumptions behind this model?	5	CO2
Q 13	A company is planning to launch a new product and lacks historical data. Explain how it can use qualitative forecasting methods to estimate demand. Name and describe any two appropriate techniques.	5	CO3
Q 14	Analyze how customer influence in product design affects demand planning in the electronics manufacturing sector. Give relevant examples of how companies adapt production strategies based on demand signals.	5	CO4
	SECTION-C 3Qx10M=30 Marks		
Q 15	Evaluate the importance of aligning forecasting time horizons with business decision-making levels (strategic, tactical, and operational). Use examples from the manufacturing and service sectors to support your explanation.	10	CO1
Q 16	The weekly number of passengers (Pax) flown by Akasa airlines are as follows: <table><tr><th>Week</th><th>Pax (in Thousands)</th><th>Week</th><th>Pax (in Thousands)</th></tr><tr><td>Week1</td><td>170</td><td>Week5</td><td>195</td></tr><tr><td>Week2</td><td>155</td><td>Week6</td><td>210</td></tr><tr><td>Week3</td><td>190</td><td>Week7</td><td>245</td></tr><tr><td>Week4</td><td>200</td><td>Week8</td><td>250</td></tr></table> a) Use the exponential smoothing method to forecast the number of Pax for Week2 to Week9. The initial forecast for Week1 was 175,000 Pax ; $\alpha = 0.2$. b) Calculate the absolute percentage error for each week from Week2 through Week8 and the MAD and MAPE of forecast error as of the end of Week8.	10	CO2
Q 17	Design a qualitative demand forecasting framework for a startup planning to launch a new organic food product line. Recommend suitable methods, justify your choices, and discuss how the insights could guide product launch and marketing strategy. **OR** A company manufacturing office furniture is struggling with fluctuating demand and rising holding costs. Apply demand planning and aggregate planning principles to recommend an actionable plan that ensures service levels are maintained while minimizing costs.	10	CO3 / CO4

Q 18	A global e-commerce platform is expanding into tier-2 cities in India. The company expects varying demand patterns based on purchasing power, festivals, and internet penetration. a) Evaluate how the company should design a forecasting system to address the unique demand dynamics of these markets. b) Discuss key components such as data sources, time horizon, types of forecasts, and integration with supply chain decisions. c) Support your evaluation with relevant examples. **OR** An apparel company uses a level production strategy for all product lines. However, it faces rising inventory costs during off-seasons and stockouts during peak seasons. a) Evaluate the effectiveness of the current aggregate planning strategy. b) Compare it with the chase and hybrid strategies, and recommend changes based on seasonal demand patterns, cost efficiency, and customer satisfaction. c) Use relevant examples and planning parameters in your justification.	**15**	**CO1 / CO4**
Q 19	You are a supply chain analyst for a company that manufactures dairy products with short shelf life. The company has noticed fluctuations in demand and wants to adopt a robust quantitative forecasting approach. <table><tr><th>Month</th><th>Demand</th><th>Month</th><th>Demand</th></tr><tr><td>Jan-24</td><td>4,000</td><td>Jul-24</td><td>6,500</td></tr><tr><td>Feb-24</td><td>3,900</td><td>Aug-24</td><td>4,950</td></tr><tr><td>Mar-24</td><td>5,300</td><td>Sep-24</td><td>6,000</td></tr><tr><td>Apr-24</td><td>4,100</td><td>Oct-24</td><td>4,200</td></tr><tr><td>May-24</td><td>5,900</td><td>Nov-24</td><td>6,800</td></tr><tr><td>Jun-24</td><td>5,400</td><td>Dec-24</td><td>7,400</td></tr></table> a) Apply two forecasting models (Exponential Smoothing and Holt's Linear Trend Model Model) and compute relevant error metrics (MAD, MAPE, MSE). b) Evaluate the accuracy of each method and justify which model the company should adopt for future planning. Support your answer with calculations and interpretation.	**15**	**CO2**