Name: Enrolment No:	

UPES

End Semester Examination, December 2024

Course: Production Planning and Control **Semester: III**

Program: MBA OPM **Time: 03 hrs.**

Course Code: LSCM8044 **Max. Marks: 100**

SECTION A
10Qx2M=20Marks

S. No.		Marks	CO
Q 1	All questions are compulsory (MCQ)		**CO1**
1.1	Which of the following forecasting methods is most appropriate when historical data exhibits both a trend and a seasonal component, but with fluctuating seasonal patterns? A) Simple Exponential Smoothing B) Holt's Linear Trend Model C) Holt-Winters Multiplicative Model D) ARIMA Model	**2**	**CO1**
1.2	In forecasting, the term "bias" refers to which of the following? A) The average of the squared differences between forecasted and actual values. B) The average of the absolute percentage error across all periods. C) A consistent tendency for forecasts to be either above or below actual values. D) The sensitivity of the forecast model to random error.	**2**	**CO1**
1.3	Which of the following accuracy metrics penalizes larger errors more heavily and is especially useful in identifying high-variance errors in production demand forecasting? A) Mean Absolute Error (MAE) B) Mean Absolute Percentage Error (MAPE) C) Mean Squared Error (MSE) D) Median Absolute Deviation (MAD)	**2**	**CO1**
1.4	In production planning, which of the following methods would be the best choice when past data is sparse, yet expert knowledge about future trends and market behavior is readily available? A) Delphi Method B) Exponential Smoothing C) Seasonal ARIMA	**2**	**CO1**

	D) Holt's Linear Model		
1.5	In an input-output model, if Sector A produces goods that are used as inputs by Sector B, Sector A's output increases when: A) The final demand for Sector B's product increases. B) Sector B finds a cheaper input alternative. C) Sector A's input costs increase. D) Sector B's demand remains constant.	**2**	**CO1**
1.6	The primary purpose of using an input-output model in production planning is to: A) Estimate the direct labor costs associated with production. B) Analyze the interdependence among different sectors in the economy. C) Forecast technological advancements in the production process. D) Determine optimal pricing strategies for each sector.	**2**	**CO1**
1.7	In the Economic Order Quantity (EOQ) model, which of the following assumptions is NOT valid? A) Demand is constant and known. B) There are discounts available for bulk purchases. C) The order cost per order is fixed. D) Inventory replenishment is instantaneous.	**2**	**CO1**
1.8	In inventory control, a "safety stock" is primarily used to: A) Minimize holding costs. B) Reduce lead time variability. C) Protect against uncertainty in demand or lead time. D) Optimize order quantity.	**2**	**CO1**
1.9	Which inventory management technique is best suited for items that are high in value but low in quantity and is often used to minimize theft and ensure precise tracking? A) Just-In-Time (JIT) B) ABC Analysis C) Two-Bin System D) EOQ Model	**2**	**CO1**
1.10	Which of the following methods is most appropriate for managing inventory items with unpredictable demand and high lead time variability? A) Fixed Order Quantity Model B) Just-In-Time (JIT) C) Periodic Review System D) Newsvendor Model	**2**	**CO1**

<table>
<tr><td colspan="4">SECTION B
4Qx5M= 20 Marks</td></tr>
<tr><td>Q 2</td><td>All questions are compulsory</td><td></td><td></td></tr>
<tr><td>2.1</td><td>Discuss the systems concept of production.</td><td>5</td><td>CO2</td></tr>
<tr><td>2.2</td><td>Briefly discuss the ways of improving productivity.</td><td>5</td><td>CO2</td></tr>
<tr><td>2.3</td><td>Explain the concept of Chase and Level Strategy with a suitable example.</td><td>5</td><td>CO2</td></tr>
<tr><td>2.4</td><td>What are the basic inputs for MRP?</td><td>5</td><td>CO1</td></tr>
<tr><td colspan="4">SECTION-C
3Qx10M=30 Marks</td></tr>
<tr><td>Q 3</td><td>All questions are compulsory</td><td></td><td></td></tr>
<tr><td>3.1</td><td>Discuss different types of production systems with suitable examples.
Or
Distinguish between design capacity and system capacity.</td><td>10</td><td>CO3</td></tr>
<tr><td>3.2</td><td>In a 1-year period, the Productive Components Corporation (known as PCCorp) has shipped units worth $1,200,000 to its customers. It produced units worth $250,000 for finished goods (FG) inventory. PCCorp has $50,000 of workin-process (WIP) units. During the same 1-year period of time, PCCorp had a labor bill of $140,000. Its capital expenses for the year are calculated to be $430,000. Materials were purchased costing $530,000. Energy expenses were $225,000, and miscellaneous expenses were estimated to be $75,000.

Calculate the labor productivity for PCCorp with respect to units shipped. In place of fixed cost, use sales; set variable cost (VC) to zero; in place of selling price (SP), use labor cost. The breakeven volume in solution is equivalent to labor productivity.</td><td>10</td><td>CO3</td></tr>
<tr><td>3.3</td><td>The following are weekly sales data, in thousands of units, for micro-computer disks:
<table><tr><td>Sales</td><td>113</td><td>101</td><td>98</td><td>107</td><td>120</td><td>132</td><td>110</td><td>117</td><td>112</td><td>125</td></tr></table>Use alpha = 0.2, 0.5 and 0.8 to produce an exponential smoothing model for these data. Which value of alpha produces better forecasts, assuming the initial forecast as 108? Explain.</td><td>10</td><td>CO3</td></tr>
<tr><td colspan="4">SECTION-D
2Qx15M= 30 Marks</td></tr>
<tr><td>Q 4</td><td>Long answers type questions</td><td></td><td></td></tr>
<tr><td>4.1</td><td>A bike manufacturing company purchases 9000 parts of a machine for its annual requirements, ordering one month’s usage at a time. Each part costs 20 Rps. The ordering cost per order is 15 Rps. And the carrying charges are 15% of the average inventory per year. You have been assigned to suggest a more economical purchasing policy for the company. What</td><td>15</td><td>CO4</td></tr>
</table>

	advice would you offer, and how much would it save the company per year?		
4.2	**Short Case – Manor Bakeries** Inventory management is one of the most important operations management activities at Manor Bakeries, Europe's largest manufacturer of 'ambient' packaged cakes and pies. (Ambient means that they can be stored at room temperature.) Its brands include Lyons and Mr Kipling. Its fleet of vans routinely restocks the shelves of thousands of small retailers and also distributes to major supermarkets, but here the re-ordering process is usually managed by the supermarket's own inventory management systems. Cakes are produced at four factories, on production lines, some of which are operated continuously. Although considerable effort is made to forecast sales accurately, there is always uncertainty. Yet there are limits to how much inventory can be used to compensate for demand fluctuations because supermarkets require products to be on their shelves for most of their shelf-life, allowing only a few days for Manor to transport, store and deliver the products. Input stocks of raw materials must also be carefully managed at each factory. Bulk ingredients such as flour and sugar are delivered to giant storage silos, but managing the hundreds of other ingredients (butter, nuts, dried fruits, pasteurized egg, etc.) is more complex. Some of these are not expensive but are used in huge volumes, while others are very expensive but usage is small. Some ingredients have a short shelf-life and have to be stored in special conditions. Some are easily available, others are specially imported and are on long lead times and fresh annual crops such as fruit can vary in quality and availability. Packaging is frequently changed to reflect new promotions and price changes. Yet running out of stock is serious. It can disrupt production schedules and lead to stock-outs of finished products, affecting both sales and customer relations. Inventory also occurs because of the way products are produced on the production lines. Although some products sell enough to warrant their own production lines, most lines have been designed to make a range of similar products. So, products are made in batches, sufficient to last until the next production run. **Questions** **1-** What are the factors that constitute inventory holding costs, order costs, and stock-out costs at Manor Bakeries? **2-** What makes its inventory planning and control so complex?	**15**	**CO4**