Name:

Enrolment No:

UPES

End Semester Examination, December 2024

Course: Operations Management **Semester: First**

Program: MBA in Logistics and Supply Chain Management **Time : 03 hrs.**

Course Code: LSCM 7001 **Max. Marks: 100**

Instructions:

SECTION A

10Qx2M=20Marks

S. No.	All questions are mandatory to attempt	Marks	CO
Q 1	Explain why operations are repetitive, while projects are temporary in nature.	2	CO1
Q 2	How can the operations strategy serve as a competitive weapon for a company?	2	CO1
Q 3	Define productivity in the context of operations management. How is it measured?	2	CO2
Q 4	Why is the proximity to suppliers an important factor when selecting a location for a production facility?	2	CO2
Q 5	What are the advantages of a cellular layout in manufacturing?	2	CO2
Q 6	How does the layout of a service facility differ from a manufacturing facility?	2	CO3
Q 7	What is assembly line balancing and why is it important for manufacturing efficiency?	2	CO3
Q 8	Name and briefly describe one method of assembly line balancing.	2	CO3
Q 9	How does the Gantt chart assist in scheduling production operations?	2	CO4
Q 10	How does technology impact long-term capacity planning?	2	CO4

SECTION B

4Qx5M= 20 Marks

Q 1	Discuss in detail the different types of material handling systems used in manufacturing operations and their advantages.	5	CO4
Q 2	A company has been recording the monthly demand data for the last 8 months for a product. The data is shown below: **Month** / **Demand (units)** 1 / 180 2 / 160 3 / 170 4 / 190	5	CO4

<table>
<tr><td></td><td>
<table>
<tr><td>5</td><td>220</td></tr>
<tr><td>6</td><td>210</td></tr>
<tr><td>7</td><td>240</td></tr>
<tr><td>8</td><td>230</td></tr>
</table>

The company has been using Exponential Smoothing to forecast its monthly demand, with a smoothing constant (α) of 0.25. Forecast demand for month 12 using the above data.</td><td></td><td></td></tr>
<tr><td>Q 3</td><td>A company is planning to set up a new factory and has narrowed down its choices to two potential locations: Location A and Location B. The company needs to evaluate these locations using the Factor Rating Method. Compute the weighted score for each location on 10 relevant factors of your choice.</td><td>5</td><td>CO5</td></tr>
<tr><td>Q 4</td><td>Under which circumstances would a company prefer a process layout over a product layout, and vice versa? Discuss with real-world examples from manufacturing and service sectors.</td><td>5</td><td>CO5</td></tr>
<tr><td colspan="4">SECTION-C
3Qx10M=30 Marks</td></tr>
<tr><td>Q 1</td><td>A retail company has collected data over the past 12 weeks regarding their weekly sales and the number of weeks since the start of a marketing campaign. The following data represents the weeks (independent variable) and sales in thousands (dependent variable):
<table>
<tr><th>Week (X)</th><th>Sales (Y)</th></tr>
<tr><td>1</td><td>50</td></tr>
<tr><td>2</td><td>55</td></tr>
<tr><td>3</td><td>57</td></tr>
<tr><td>4</td><td>60</td></tr>
<tr><td>5</td><td>65</td></tr>
<tr><td>6</td><td>68</td></tr>
<tr><td>7</td><td>72</td></tr>
<tr><td>8</td><td>75</td></tr>
<tr><td>9</td><td>80</td></tr>
<tr><td>10</td><td>83</td></tr>
<tr><td>11</td><td>85</td></tr>
<tr><td>12</td><td>90</td></tr>
</table>

Forecast the sales for weeks 19 and 38 using the above data.</td><td>10</td><td>CO5</td></tr>
<tr><td>Q 2</td><td>A company is transporting goods from 3 warehouses (A, B, C) to 4 retail stores (X, Y, Z, W). The supply and demand for the warehouses and retail stores are as follows:</td><td>10</td><td>CO5</td></tr>
</table>

		X	**Y**	**Z**	**W**	**Supply**		
	Warehouse A	4	6	8	7	50		
	Warehouse B	5	8	7	6	60		
	Warehouse C	9	7	4	5	70		
	Demand	40	70	60	10			
	Solve the transportation problem using the Vogel's Approximation Method (VAM) and Northwest Corner Method (NCM). Compare the total transportation costs from the two methods and comment on the efficiency of each method in finding the optimal solution.							
Q 3	A company is considering two locations for setting up a new manufacturing unit. Location A has a fixed cost of $500,000 and a variable cost of $20 per unit. Location B has a fixed cost of $400,000 and a variable cost of $25 per unit. Calculate the break-even point in terms of units for both locations and recommend the more cost-effective location.						**10**	**CO5**
	SECTION-D **2Qx15M= 30 Marks**							
Q 1	Assume you are the inventory manager of a multinational manufacturing company with a portfolio of 1,000 inventory items. The company has provided you with the following partial data of 10 items: **Item Code** / **Annual Usage (units)** / **Unit Cost ($)** A1 / 500 / 100 A2 / 1,000 / 50 B1 / 200 / 250 B2 / 1,500 / 30 C1 / 700 / 20 C2 / 300 / 150 D1 / 2,000 / 5 D2 / 400 / 75 E1 / 1,200 / 40 E2 / 800 / 60 Classify the items into categories A, B, and C.						**15**	**CO2**
Q 2	A company wants to predict the sales revenue (in $1000) of its product based on advertising expenditure (in $1000) and price of the product (in $). The following data was collected: **Advertising Expenditure ($1000)** / **Price ($)** / **Sales Revenue ($1000)** 5 / 20 / 50						**15**	**CO5**

		10	15	70			
		15	10	90			
		20	8	110			
		25	5	140			
	Forecast the sales revenue when, advertising expenditure is $18,000 and price is $12.						