


<b>Name:</b> <b>Enrolment No:</b>			
<b>UPES</b> <b>End Semester Examination, May 2025</b>			
<b>Course: Operations Management</b> <b>Program: BBA (All)</b> <b>Course Code: LSCM1002</b>		<b>Semester: II</b> <b>Time : 03 hrs.</b> <b>Max Marks: 100</b>	
<b>Instructions: Students are not allowed to use Scientific Calculators</b>			
<b>SECTION A</b> <b>10Qx2M=20Marks</b>			
S. No.		Marks	CO
Q 1	All questions are compulsory (Short answer types).		
1.1	Briefly explain the objectives of materials management.	2	CO1
1.2	Define the term total quality management.	2	CO1
1.3	What is the ERP?	2	CO1
1.4	What do 'b' and 'c' indicate in a line of regression?	2	CO1
1.5	Define the workstation cycle time in an assembly line.	2	CO1
1.6	List any five factors affecting machine productivity.	2	CO1
1.7	What is KANBAN?	2	CO1
1.8	Define the static layout with a suitable example.	2	CO1
1.9	What are the different assumptions made in the calculation of the optimum order size through the EOQ model?	2	CO1
1.10	Discuss the objectives of materials handling.	2	CO1
<b>SECTION B</b> <b>4Qx5M= 20 Marks</b>			
Q 2	All questions are compulsory		
2.1	Discuss the ABC and VED techniques of inventory control with suitable examples.	5	CO2
2.2	Briefly explain the various controllable and uncontrollable factors affecting your decisions regarding the plant location selection for a paper mill industry.	5	CO2
2.3	Discuss the significance of statistical process control in operations management	5	CO2
2.4	How do the productivity improvements differ from production improvements? Justify your answer with appropriate examples.	5	CO2
<b>SECTION-C</b> <b>3Qx10M=30 Marks</b>			

Q3	Discuss the key characteristics, potential benefits, and challenges of using process and product plant layouts with suitable examples.	<b>10</b>	<b>CO3</b>																
Q4	What is material handling? Discuss the materials handling principles. What are the different types of materials handling equipments used in the manufacturing industries?	<b>10</b>	<b>CO3</b>																
Q5	<p>You are tasked with helping a logistics company optimize the location of a new distribution centre to serve three existing retail stores. The table below shows the coordinates of each retail store, along with the estimated annual demand at each store and the distance between the proposed distribution centre and each store:</p> <table border="1"> <thead> <tr> <th>Retail Store</th><th>Coordinates (x, y)</th><th>Annual Demand (units)</th><th>Transportation cost (Rupees/unit-distance)</th></tr> </thead> <tbody> <tr> <td>Store A</td><td>(2, 5)</td><td>800</td><td>10</td></tr> <tr> <td>Store B</td><td>(7, 9)</td><td>1200</td><td>15</td></tr> <tr> <td>Store C</td><td>(6, 3)</td><td>600</td><td>12</td></tr> </tbody> </table> <p>Using the Centre of Gravity Method, determine the coordinates (x, y) for the optimal location of the distribution centre to minimize transportation costs. Calculate the total transportation cost associated with this location.</p>	Retail Store	Coordinates (x, y)	Annual Demand (units)	Transportation cost (Rupees/unit-distance)	Store A	(2, 5)	800	10	Store B	(7, 9)	1200	15	Store C	(6, 3)	600	12	<b>10</b>	<b>CO3</b>
Retail Store	Coordinates (x, y)	Annual Demand (units)	Transportation cost (Rupees/unit-distance)																
Store A	(2, 5)	800	10																
Store B	(7, 9)	1200	15																
Store C	(6, 3)	600	12																

**SECTION-D**  
**2Qx15M= 30 Marks**

Q6	<p>a) How do the ordering cost and holding cost change with changes in order size? Discuss the inventory planning and control model used to determine the optimum lot size that minimizes the total inventory cost. (10 Marks)</p> <p>b) An Electronic Village stocks and sells a particular brand of personal computer. It costs the store \$450 each time it places an order with the manufacturer for the personal computers. The annual cost of carrying the PCs in inventory is \$170. The store manager estimates that the annual demand for PCs will be 1200 units. Determine the optimal order quantity and the total minimum inventory cost. (5 Marks)</p>	<b>15</b>	<b>CO4</b>																
Q7	<p>An automobile company is planning to introduce a new product line. The industry's target is to produce 500 units per day within an 8-hour shift to meet the market demand. The company has determined the necessary tasks, their sequence, and the estimated processing time for each task as given below.</p> <table border="1"> <thead> <tr> <th>Task</th><th>Description</th><th>Task time (in seconds)</th><th>Precedence</th></tr> </thead> <tbody> <tr> <td>A</td><td>Position rear axle support</td><td>15</td><td></td></tr> <tr> <td>B</td><td>For screws to nuts</td><td>23</td><td>A</td></tr> <tr> <td>C</td><td>Insert rear axle</td><td>17</td><td>B</td></tr> </tbody> </table>	Task	Description	Task time (in seconds)	Precedence	A	Position rear axle support	15		B	For screws to nuts	23	A	C	Insert rear axle	17	B	<b>15</b>	<b>CO4</b>
Task	Description	Task time (in seconds)	Precedence																
A	Position rear axle support	15																	
B	For screws to nuts	23	A																
C	Insert rear axle	17	B																

	D	Tighten rear axle support screws to nut	42	B
	E	Position the front axle assembly	15	B
	F	Fasten with four screws to nuts	23	C
	G	Tighten front axle assembly screws	5	D, E
	H	Position rear wheel 1	12	F, G
	I	Position rear wheel 2	34	H
	J	Position front wheel 1	27	H
	K	Position front wheel 2	18	I, J
	L	Shock testing	7	K
	a) Draw the precedence diagram and calculate the cycle time of the automobile for the given case. b) Determine the theoretical and minimum numbers of workstations required to balance the production line? c) Calculate the line efficiency for the given problem.			