

Trim: Sep – Nov 24		
Maximum Marks: 25	Examination: ETE Exam	Date: 16/01/2025
Duration: 90 mins		
Programme code: 01	Class: SY	Semester/Trimester: V
Programme: MBA (Minor)		
College: K. J. Somaiya Institute of Management		Name of the department/Section/Center: OPERATIONS MANAGEMENT
Course Code: 217P01M549		Name of the Course: SUPPLY CHAIN ANALYTICS
Instructions: Read the Questions properly and answer to the point Excel sheet is not to be submitted. Hence present the answers clearly on the answer sheet.		

Question No.		Max. Marks																																																	
1	<p>Consider a transportation problem with three sources and three demand points. Availability in supply points is 30, 40 and 60 respectively and requirements are 20, 60 and 50 respectively. Unit transportation costs are shown in the table.</p> <table><tr><td></td><td>D1</td><td>D2</td><td>D3</td><td></td></tr><tr><td>S1</td><td>4</td><td>6</td><td>8</td><td>30</td></tr><tr><td>S2</td><td>6</td><td>7</td><td>6</td><td>40</td></tr><tr><td>S3</td><td>4</td><td>8</td><td>12</td><td>60</td></tr><tr><td></td><td>20</td><td>60</td><td>50</td><td></td></tr></table> <p>a) Use Penalty cost method to find the Initial solution. Present the solution in a neat network diagram and state the total cost.</p> <p>b) Solve the problem using Excel solver. State the total cost and present the solution in a neat network diagram.</p> <p>c) Comment on solution obtained in (a) and (b).</p>		D1	D2	D3		S1	4	6	8	30	S2	6	7	6	40	S3	4	8	12	60		20	60	50		10																								
	D1	D2	D3																																																
S1	4	6	8	30																																															
S2	6	7	6	40																																															
S3	4	8	12	60																																															
	20	60	50																																																
2	<p>Spectra Corp has done a ABC analysis and wants to fix an inventory policy for the top two items. The data for the two items are tabulated.</p> <table><tr><td></td><td>Item 1</td><td>Item 2</td></tr><tr><td>Annual demand (units)</td><td>25000</td><td>40000</td></tr><tr><td>Ordering cost (Rs.)</td><td>1000</td><td>1000</td></tr><tr><td>Carrying cost (%)</td><td>20%</td><td>20%</td></tr><tr><td>Unit cost (Rs.)</td><td>50</td><td>75</td></tr></table> <p>Calculate the following for both the items:</p> <p>a) EOQ</p> <p>b) Number of orders placed in a year</p> <p>c) Order quantities if Spectra Corp decides to limit the number of orders to 10 each.</p>		Item 1	Item 2	Annual demand (units)	25000	40000	Ordering cost (Rs.)	1000	1000	Carrying cost (%)	20%	20%	Unit cost (Rs.)	50	75	6																																		
	Item 1	Item 2																																																	
Annual demand (units)	25000	40000																																																	
Ordering cost (Rs.)	1000	1000																																																	
Carrying cost (%)	20%	20%																																																	
Unit cost (Rs.)	50	75																																																	
3	<p>Consider a five city Vehicle routing problem as indicated below. Calculate the savings matrix.</p> <table><tr><td></td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>0</td><td>---</td><td>10</td><td>7</td><td>8</td><td>9</td><td>6</td></tr><tr><td>1</td><td></td><td>---</td><td>7</td><td>8</td><td>10</td><td>12</td></tr><tr><td>2</td><td></td><td></td><td>---</td><td>8</td><td>7</td><td>9</td></tr><tr><td>3</td><td></td><td></td><td></td><td>---</td><td>10</td><td>5</td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td>---</td><td>9</td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td>---</td></tr></table>		0	1	2	3	4	5	0	---	10	7	8	9	6	1		---	7	8	10	12	2			---	8	7	9	3				---	10	5	4					---	9	5						---	6
	0	1	2	3	4	5																																													
0	---	10	7	8	9	6																																													
1		---	7	8	10	12																																													
2			---	8	7	9																																													
3				---	10	5																																													
4					---	9																																													
5						---																																													
4	<p>Answer the following questions for a ‘n’ location Vehicle Routing problem (VRP)</p> <p>a) Name of the heuristic approach.</p> <p>b) Number of route combinations to calculate the savings matrix.</p>	3																																																	

