



Name:
Enrolment No:

UPES

End Semester Examination, December 2023

Course: Introduction to Supply Chain Management
Program: MBA (Logistics & Supply Chain Management)
Course Code: LSCM 7029

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

Instructions:

SECTION A
10Qx2M=20Marks

S. No.	Attempt all questions in this section	Marks	CO
Q 1	Explain the following and fill in the blank		
(i)	<p>The following warehousing methodology is one in which goods are not actually warehoused in a facility. Instead, trucks from suppliers, each carrying a different type of product, deliver goods to a facility. There the inventory is broken into smaller lots and quickly loaded onto store-bound trucks that carry a variety of products, some from each of the supplier trucks.</p> <p>A. Warehouse unit storage B. Stock keeping unit (SKU) storage C. Job lot storage D. Cross-docking</p>	2	CO1
(ii)	<p>Efficient supply chains</p> <p>A. respond quickly to demand. B. have higher margins because price is not a prime customer driver. C. maintain buffer inventory to deal with demand/supply uncertainty. D. maximize performance at a minimum cost.</p>	2	CO1
(iii)	<p>Supply chain responsiveness includes the ability to do which of the following?</p> <p>A. Report financial results with a high degree of accuracy B. Meet a very high service level C. Ship product in larger quantities than your competitors D. Substitute similar products to fill orders when the desired products are unavailable</p>	2	CO1
(iv)	The manufacturer and supplier participate in the	2	CO1

	A. procurement cycle. B. replenishment cycle. C. manufacturing cycle. D. life cycle.		
(v)	Cycle inventory exists because producing or purchasing in large lots allows a stage of the supply chain to A. exploit economies of scale and raise cost. B. exploit economies of scale and lower cost. C. exploit customers and lower cost. D. exploit customers and raise cost.	2	CO1
(vi)	Average flow time resulting from cycle inventory is equal to A. Cycle Inventory/Demand = $Q/2$. B. Cycle Inventory/Demand = $Q/2D$. C. Cycle Inventory = $Q/2$. D. Cycle Inventory = Lot Size = Q .	2	CO1
(vii)	All costs that do not vary with the size of the order but are incurred each time an order is placed are referred to as A. the material cost and are denoted by C. B. the fixed ordering cost and are denoted by S. C. the holding cost and are denoted by H. D. the purchase price and are denoted by P.	2	CO1
(viii)	If demand increases by a factor of k, the optimal lot size increases by a factor of A. k. B. $k/2$. C. k-squared. D. the square root of k.	2	CO1
(ix)	Break bulk	2	CO1
(x)	Postponement strategy	2	CO1

SECTION B
4Qx5M= 20 Marks

Q	Attempt all questions		CO
2	Explain the various cycle views of supply chain?	5	CO2
3	Explain WMS and important KPI's of warehouse?	5	CO2
4	Evaluate the difference between horizontal integration, vertical integration & virtual integration?	5	CO2
5	Write short notes on National Water Highways & Dedicated freight corridor?	5	CO2

SECTION-C
3Qx10M=30 Marks

Q	Attempt all questions		CO
6	<p>Best buy sells three models of smart meters, the Litepro, the Medpro, and the Heavypro. Annual demands for the three products are $DL = 12,000$ for the Litepro, $DM = 1,200$ units for the Medpro, and $DH = 120$ units for the Heavypro. Each model costs Best Buy \$500. A fixed transportation cost of \$4,000 is incurred each time an order is delivered. For each model ordered and delivered on the same truck, an additional fixed cost of \$1,000 is incurred for receiving and storage. Best Buy incurs a holding cost of 20 percent. Evaluate the lot sizes that the Best Buy manager should order if lots for each product are ordered and delivered independently. Calculate the following:</p> <p>(a) Optimal order size (b) cycle inventory (c) Annual holding cost (d) Order frequency (e) Annual ordering cost (f) Average flow time</p>	10	CO3
7	<p>Uttarakhand power corporation limited has seen the demand of electricity consumption in Uttarakhand increase over the last six months. Observed demand has been 5500 MW, 5372 MW, 7314MW, 9808MW, 10413MW and 11961 MW. Forecast demand for period 3 using trend corrected exponential smoothing with $\alpha=0.1$ & $\beta=0.2$</p>	10	CO3
8	<p>Alstom International has decided to manufacture transformer & they decided India as its manufacturing base for the supply of transformers to the European markets. The company offers 3 types of transformers: heavy duty, standard & low end duty. All 3 types of transformers offered by the firm are similar in size & shape. The only difference is in the load handling capacity & robustness. The 3 models of the transformers cost \$ 30000, \$ 20000 & \$ 10000 per unit respectively. If the firm decides to use air as the mode of transport, it can fly the goods in smaller lots of 200 units, while shipping via sea requires a minimum shipment size of 400 units. The demand in Europe is stable at 125 units per week for each of the three types of transformers. Transportation & custom clearances takes 1 week, if air is used as a mode of transport & the same will take 3 week if sea is used as a mode of transport. Freight by air will be \$ 500/unit & freight by sea will be \$ 110/unit. The annual inventory carrying cost for the firm is 15% of the cost of the item.</p> <p>(a)The firm wants to decide upon the optimum mode of transport, when the demand is stable & fixed (b) Also take a decision when each of the three products faces similar demand uncertainty and has standard deviation of demand equal to 30 units & Alstom targets a service level of 98%.</p>	10	CO3

SECTION-D
2Qx15M= 30 Marks

Q	Read the balance sheet of two companies Amazon & Nordstrom and calculate the following financial supply chain measures & also analyze the results.																																																																																						
	<p>Financial statements for Walmart stores Inc. & Macy's Inc. are given below. Evaluate the financial performance of each company based on the various metrics such as ROA, ROE, profit margin, ROFL, asset turns, APT, ART, Inventory turnover, PPET & C2C, the tax rate is 35%. Explain the differences in their performance based on their supply chain strategy and structure?</p> <table border="1" data-bbox="228 537 1182 1654"> <thead> <tr> <th colspan="3" data-bbox="228 537 1182 579">Comparison of Firm Performance</th> </tr> <tr> <th data-bbox="228 579 797 621"></th> <th data-bbox="797 579 995 621">Walmart</th> <th data-bbox="995 579 1182 621">Macy's</th> </tr> </thead> <tbody> <tr> <td data-bbox="228 621 797 663">Net operating revenues</td> <td data-bbox="797 621 995 663">469,162</td> <td data-bbox="995 621 1182 663">27,686</td> </tr> <tr> <td data-bbox="228 663 797 705">Cost of goods sold</td> <td data-bbox="797 663 995 705">352,488</td> <td data-bbox="995 663 1182 705">16,538</td> </tr> <tr> <td data-bbox="228 705 797 747">Gross profit</td> <td data-bbox="797 705 995 747">116,674</td> <td data-bbox="995 705 1182 747">11,148</td> </tr> <tr> <td data-bbox="228 747 797 789">Selling, general, and administrative expense</td> <td data-bbox="797 747 995 789">88,873</td> <td data-bbox="995 747 1182 789">8,482</td> </tr> <tr> <td data-bbox="228 789 797 831">Operating income</td> <td data-bbox="797 789 995 831">27,801</td> <td data-bbox="995 789 1182 831">2,661</td> </tr> <tr> <td data-bbox="228 831 797 873">Interest expense</td> <td data-bbox="797 831 995 873">2,251</td> <td data-bbox="995 831 1182 873">425</td> </tr> <tr> <td data-bbox="228 873 797 915">Other income (loss) - net</td> <td data-bbox="797 873 995 915">187</td> <td data-bbox="995 873 1182 915">(134)</td> </tr> <tr> <td data-bbox="228 915 797 957">Income before income taxes</td> <td data-bbox="797 915 995 957">25,737</td> <td data-bbox="995 915 1182 957">2,102</td> </tr> <tr> <td data-bbox="228 957 797 999">Income taxes</td> <td data-bbox="797 957 995 999">7,981</td> <td data-bbox="995 957 1182 999">767</td> </tr> <tr> <td data-bbox="228 999 797 1041">Net income</td> <td data-bbox="797 999 995 1041">17,756</td> <td data-bbox="995 999 1182 1041">1,198</td> </tr> <tr> <td colspan="3" data-bbox="228 1041 1182 1083">Assets</td> </tr> <tr> <td data-bbox="228 1083 797 1125">Cash and cash equivalents</td> <td data-bbox="797 1083 995 1125">7,781</td> <td data-bbox="995 1083 1182 1125">1,836</td> </tr> <tr> <td data-bbox="228 1125 797 1167">Net receivables</td> <td data-bbox="797 1125 995 1167">6,768</td> <td data-bbox="995 1125 1182 1167">371</td> </tr> <tr> <td data-bbox="228 1167 797 1209">Inventories</td> <td data-bbox="797 1167 995 1209">43,803</td> <td data-bbox="995 1167 1182 1209">5,308</td> </tr> <tr> <td data-bbox="228 1209 797 1251">Total current assets</td> <td data-bbox="797 1209 995 1251">59,940</td> <td data-bbox="995 1209 1182 1251">7,876</td> </tr> <tr> <td data-bbox="228 1251 797 1293">Property, plant and equipment</td> <td data-bbox="797 1251 995 1293">116,681</td> <td data-bbox="995 1251 1182 1293">8,196</td> </tr> <tr> <td data-bbox="228 1293 797 1335">Goodwill</td> <td data-bbox="797 1293 995 1335">20,497</td> <td data-bbox="995 1293 1182 1335">3,743</td> </tr> <tr> <td data-bbox="228 1335 797 1377">Other assets</td> <td data-bbox="797 1335 995 1377">5,987</td> <td data-bbox="995 1335 1182 1377">615</td> </tr> <tr> <td data-bbox="228 1377 797 1419">Total assets</td> <td data-bbox="797 1377 995 1419">203,105</td> <td data-bbox="995 1377 1182 1419">20,991</td> </tr> <tr> <td colspan="3" data-bbox="228 1419 1182 1461">Liabilities and Stockholder Equity</td> </tr> <tr> <td data-bbox="228 1461 797 1503">Accounts payable</td> <td data-bbox="797 1461 995 1503">59,099</td> <td data-bbox="995 1461 1182 1503">4,951</td> </tr> <tr> <td data-bbox="228 1503 797 1545">Short-term debt</td> <td data-bbox="797 1503 995 1545">12,719</td> <td data-bbox="995 1503 1182 1545">124</td> </tr> <tr> <td data-bbox="228 1545 797 1587">Total current liability</td> <td data-bbox="797 1545 995 1587">71,818</td> <td data-bbox="995 1545 1182 1587">5,075</td> </tr> <tr> <td data-bbox="228 1587 797 1629">Long-term debt</td> <td data-bbox="797 1587 995 1629">41,417</td> <td data-bbox="995 1587 1182 1629">6,806</td> </tr> <tr> <td data-bbox="228 1629 797 1671">Total liabilities</td> <td data-bbox="797 1629 995 1671">126,243</td> <td data-bbox="995 1629 1182 1671">14,940</td> </tr> <tr> <td data-bbox="228 1671 797 1713">Stockholder equity</td> <td data-bbox="797 1671 995 1713">76,343</td> <td data-bbox="995 1671 1182 1713">6,051</td> </tr> </tbody> </table>	Comparison of Firm Performance				Walmart	Macy's	Net operating revenues	469,162	27,686	Cost of goods sold	352,488	16,538	Gross profit	116,674	11,148	Selling, general, and administrative expense	88,873	8,482	Operating income	27,801	2,661	Interest expense	2,251	425	Other income (loss) - net	187	(134)	Income before income taxes	25,737	2,102	Income taxes	7,981	767	Net income	17,756	1,198	Assets			Cash and cash equivalents	7,781	1,836	Net receivables	6,768	371	Inventories	43,803	5,308	Total current assets	59,940	7,876	Property, plant and equipment	116,681	8,196	Goodwill	20,497	3,743	Other assets	5,987	615	Total assets	203,105	20,991	Liabilities and Stockholder Equity			Accounts payable	59,099	4,951	Short-term debt	12,719	124	Total current liability	71,818	5,075	Long-term debt	41,417	6,806	Total liabilities	126,243	14,940	Stockholder equity	76,343	6,051		
Comparison of Firm Performance																																																																																							
	Walmart	Macy's																																																																																					
Net operating revenues	469,162	27,686																																																																																					
Cost of goods sold	352,488	16,538																																																																																					
Gross profit	116,674	11,148																																																																																					
Selling, general, and administrative expense	88,873	8,482																																																																																					
Operating income	27,801	2,661																																																																																					
Interest expense	2,251	425																																																																																					
Other income (loss) - net	187	(134)																																																																																					
Income before income taxes	25,737	2,102																																																																																					
Income taxes	7,981	767																																																																																					
Net income	17,756	1,198																																																																																					
Assets																																																																																							
Cash and cash equivalents	7,781	1,836																																																																																					
Net receivables	6,768	371																																																																																					
Inventories	43,803	5,308																																																																																					
Total current assets	59,940	7,876																																																																																					
Property, plant and equipment	116,681	8,196																																																																																					
Goodwill	20,497	3,743																																																																																					
Other assets	5,987	615																																																																																					
Total assets	203,105	20,991																																																																																					
Liabilities and Stockholder Equity																																																																																							
Accounts payable	59,099	4,951																																																																																					
Short-term debt	12,719	124																																																																																					
Total current liability	71,818	5,075																																																																																					
Long-term debt	41,417	6,806																																																																																					
Total liabilities	126,243	14,940																																																																																					
Stockholder equity	76,343	6,051																																																																																					
9	Calculate the various metrics such as ROA, ROE, profit margin, ROFL, asset turns, APT, ART, Inventory turnover, PPET & C2C	20	CO4																																																																																				
10	Analyze the results with explanation?	10	CO4																																																																																				