Roll No. _____

(Do not write anything on question paper except Roll No.)

[This paper consists of FIVE Pages]

Jagan Institute of Management Studies

End-Term Examination, September, 2016

Trimester IV – PGDM 2015-17

Supply Chain Management

ET_PG_SCM_3009

Time: 3 Hrs. *M. Marks: 70*

INSTRUCTIONS: Attempt any FIVE questions including Q1 & Q7 which are compulsory.

Q 1 Attempt and Comment on any **FOUR** of the following:

a) Discuss the various Internet Technologies and Electronic Commerce in SCM

b) Explain the following concepts to the Management of Walton Seeds i) Milk Run ii) Hub and Spoke iii) RFID.

c) Various strategies of Capacity expansion.

d) Explain i) Reverse Logistics and JIT ii) 3PL and 4PL logistics.

e) Material Handling Equipment.

f) The forecast for five years for two types of seeds being polished by Walton seeds brand X and brand Y are as follows:

	Demand of packets ('000) Year wise				
	1	2	3	4	5
X	420	570	750	900	1100
Y	915	1815	2715	3165	3555

Polishing of Brand X takes place on a machine 'P' of which two are available. The production rate is 4,50,000 of Brand X per machine. The labour requirement is two per machine. The Brand Y is made on machine 'Q' of which four are available. The production rate is 7,50,000 of product Y per machine. The labour requirement is three per machine. Project labour and machine requirement for the next five years. **16**

Q 2 The management at Walton Seed Company have given you the following details and have given you a free hand to plan production for four month period for its New Brand of Polished Seeds being Polished at its new outlet: The demand forecast is spring 20,000, summer 10,000; fall 15000; winter 18000. At the beginning of spring they have 70 workers and 1,000 units in inventory. The union contract specifies that you may lay off workers only once a year, at the beginning of summer. Also you may hire new workers only at the beginning of fall to

begin regular work in the fall. The workers in fall shall continue to work till the end of winter. The number of worker laid off at the beginning of summer and the number hired at the beginning of fall should result in planned production levels for summer and fall that equals the demand forecasts for summer and fall, respectively (i.e. demand is met in summer and fall) If demand exceeds supply, use overtime in spring only. No overtime in winter. Which means that backorders could occur in winter? You are given these costs; hiring, $100 per new worker; layoff, $200 per worker laid off; inventory holding, $20 per unit-quarter; straight-time labor, $10 per hour; overtime, $15 per hour; backorder, $8 per unit. Productivity is 0.5 unit per worker hour (i.e 1 unit in 2 worker hour), eight hours per day, 50 days per quarter. Find the total cost of this plan.
(Separate Aggregate Planning sheet is enclosed which may be attached with the Answer sheet)? **12**

Q 3 The information regarding the sale of seeds at one of the outlets for the past 12 quarters for the past 3 years:

Year	Quarter	Demand of Seeds ('000)
2012	**Qtr 1**	**10**
	Qtr 2	**45**
	Qtr 3	**79**
	Qtr 4	**19**
2013	**Qtr 1**	**15**
	Qtr 2	**48**
	Qtr 3	**77**
	Qtr 4	**26**
2014	**Qtr 1**	**16**
	Qtr 2	**52**
	Qtr 3	**89**
	Qtr 4	**28**

a) Explain the interdependence of Forecasting and Planning in SCM. How important is it in reducing demand uncertainty. **4**

b) Decompose the time series data according to a multiplicative model Y = T x S and forecast for the next four quarters of the next year. **8**

Q 4 **a)** What are the various costs involved in inventory management. What is P-type and Q-type inventory management system? **4**

b) A dealer buys seeds from Walton Seed Company and it is found by the dealer that a) its demand is 18000 packets of seed per annum and is uniformly distributed over the year, b) its cost price is $ 5 per unit, c) its ordering cost is $ 50 per order, d) the inventory carrying cost is 9% per annum of the average dollar inventory. The Number of Working days is **5**

300 in a year and the lead time by Walton is 2 days. Determine i)The economic ordered quantity (EOQ) ii)The total cost with the policy of ordering an amount equal to EOQ. Iii) No. of orders iv) Time period between orders v) daily demand rate vi)ROL. {Formulas EBQ= $\sqrt{(2D*C_o/C_h)}$, Total Cost;- $(D*C)+(D*Co/Q)+(½*Q*C_h)$))

c) With the dealers details as follows a) demand is 18000 packets of seed per annum and is uniformly distributed over the year, b) its ordering cost is $ 50 per order, c) the inventory carrying cost is 9% per annum of the average dollar inventory) The Walton seed company has now decided to give to its dealer the following discount

Qty purchased (packets)	Unit price per packet of seed
1-9999	$ 5
10000-17999	$ 4.5
18000 or more	$ 4

What is the new EOQ. **3**

Q 5 **a)** Explain the factors that determine the Location of facility in a Supply Chain. If Walton Seed wants to open its new retail outlet; what factors do you think would be more important? **6**

b) Explain the various "process types" and "layout types" in an operations unit. How volume and variety does decides this. Why do you think is it important decision in supply chain. **6**

Q 6 **a)** Explain the various Transportation Modes available to Walton Seeds ; the pros and cons and what mode they would use in case they ship Seeds to i) Canada ii) London (in bulk) **6**

b) Explain Warehous operations, strategic storage, warehouse functionality, Warehouse operating principles, decisions, selection, Developing warehouse resources. **6**

Q 7 Read the case and answer the questions given at the end.

Walton seed company

"We have to do something about our customer service levels and out inventory turns" complained Lisa Williams, CEO for Walton Seed Company, to Jason Greaser, the new director of logistics. Jason immediately wanted to know the details of the problem, since he had just joined Walton Seed and had not had an opportunity to really delve into any of its problems. Lisa responded, "Let me give you some of the background and you can put that education to use that you received at Penn State".

Jason smiled and said," I am really interested in addressing some of the major problems and issues that Walton Seed has in the logistics area, so

I can put my education and experience to good use. We had a similar problem at CBL Electronics, where I did my internship. While I realize that the products are different, there may be some common threads."

Background:

Walton Seed Company was founded by Eric Walton in Toledo, Ohio, and subsequently moved to York, Pennsylvania. Traditionally, Walton's niche was a high quality seed company selling grass, flower, and vegetable seeds through a mail-order catalog. But it subsequently started to distribute through small, family owned hardware and variety stores. As the business grew, the company expanded it distribution to several smaller wholesalers, who gave Walton additional market coverage in Ohio, Indiana, Illionois, and New York. Walton still continued its catalog business in the Middle Atlantic States and served retailers directly in Penssylvania, Maryland and New Jersey.

The seed business is such that sales are traditionally very heavy in the spring and early summer and drop off dramatically for the rest of the year. Catalog sales help to spread out demand a little by making sales promotions in the January / February mailing when people start thinking "spring" to help get through the winter; but, overall, sales are still very concentrated. Therefore, Walton pushes inventory out into its warehouse during the fall and winter to be ready for the big spring and summer sales spurt.

During the season, the company runs out of certain types of seeds and has an abundance of others. The wholesalers and retailers complain about the stockouts. Sometimes they will accept substitutions but not often enough. The wholesalers and retailers do not provide in- season sales information and tend to buy large quantities prior to the start of the season.

Another matter worrying Lisa Williams is the decline in the number of independent hardware and variety stores, with the growth of Wall-Mart, Home Depot, Lowe's and others of similar size. Walton does not sell to these stores, directly or indirectly, because Walton has positioned itself at the higher end of the market with high quality seeds.

Walton really wants to increase its late summer and fall sales of grass seeds and perennial flower seeds, to spread out demand and also to avoid stockouts which result in lost sales and customers.

The problem:

"Well Jason, there you have it in a nutshell," said Lisa. "It is an exasperating situation, and we need your help in solving these problems.

'Wow, you are right!" replied Jason, "There are really challenging issues; I won't be able to claim that you didn't give me anything significant to sink my teeth into. Do you have anything specific that you want me start with, since this is such a comprehensive set of problems?

Questions:

a) How can we improve in-season sales forecasting and develop a logistics system that is more responsive to demand and sales? **3**

b) What are some of the special logistical issues that we will need to consider if we attempt to sell to the mass merchandisers? What E-commerce alternatives do you feel should be considered. **4**

c) Briefly explain the Drivers of SCM and at least two metrics for anyone of the drivers. **5**

d) Explain to the Management the recent_trends in the supply chain management **6**

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Aggregate Planning Worksheet

(The sheets may be attached with the answer sheets)

FORECAST						
BEGINNING INV.						
PRODUCTION REQD.						
PROD.HRS REQD.						
DAYS						
WORKERS WORKING						
PROD.HRS AVAILABLE						
OVERTIME						
HIRING						
FIRING						
ACTUAL PROD.HRS						
ACTUAL PRODUCTION						
NET WORKERS WORKING						
ENDING INVENTORY						
COSTS						
BACKORDERING						
OVERTIME						
HIRING						
FIRING						
INV. HOLDING						
REGULAR COST						
TOTAL					GRAND TOTAL =	
DETAILS						
OVERTIME MAX.						
WORKERS =						
PRODUCTIVITY =			UNITS PER HR			
HOURS =						
NO. OF DAYS =			PER MONTH			
BEGINNING INV. =						
COSTS						

BACKORDERING =			PER UNIT			
OVERTIME =			PER HOUR			
HIRING =			PER WORKER			
FIRING =			PER WORKER			
INV. HOLDING =			PER UNIT PER TIME PERIOD			
STRAIGHT TIME =			PER HOUR			
CALCULTION FOR HIRING/FIRING WORKERS						
HIRING =						
PROD. HRS AVB						
FIRING =						

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