

K. J. SOMAIYA INSTITUTE OF MANAGEMENT STUDIES AND RESEARCH

PGDM (Ops) and MMS (Ops) 2017-19 – V TRIM

Advanced Logistics and Supply Chain Management

Maximum Marks: 50

Duration: 3 hours

Date: 7th January 2019

Notes:

1. Q1 and 2 are compulsory. From Q 3 to 6 answer any 3 questions.
2. **All questions carry equal marks.**
3. Please make suitable assumptions, if required, and state these. The tables for Standard Normal Distribution and Standard Normal Loss Function are enclosed. You may use these where applicable.
4. Please be brief and to the point. Answers given in point form would be preferred.

Case Study

SRL laboratories: Logistics as a Differentiator

Super Religare Labs is the largest pathology laboratory network in India, servicing nearly 4000 hospitals/labs and over 50000 doctors SRL performs over 34000 tests in a day (10 million tests in a year). It offers a comprehensive range of over 4500 tests, from routine to highly specialized tests. The tests are based on over 200 technologies, covering most known diseases. For a smooth operations of its lab network of 8 reference labs, 181 network labs and 888 collection centers spread across 400 cities in India It has built an highly efficient logistics department that forms the backbone of the company. Logistics management becomes key for the success of the business model adopted by SRL in the pathology testing sector. Using the latest technologies, SRL offers wide ranging test menu, at par with the best in the world, covering illness, including infectious, metabolic, genetic, and lifestyle disorders across all medical specialties.

Logistics management helps SRL deliver on the promise of quality service on time and the large network is used efficiently to honor the trust of the patients. The specimen collection is performed in accordance with the specimen collection standards operating procedure, which confirms to the national Commission for Clinical laboratory Standards (NCCLS), the US guideline for specimen collection. All the logistics operations are in conformance with IATA/ICAO transport regulations. The company has developed a well established system and procedure for the safe and smooth movement of shipments nationally and from across the globe in suitable cold chain conditions. The entire logistics operation is supported by a large team of pick up courier riders, collection centers, courier companies, and freight forwarding companies for a wider reach across the country. SRL logistics system ensures that the integrity of samples is maintained right from the time it is picked until it is delivered to the lab, for which a series of systems are set in place for packaging, transportation tracking of the samples and delivery. The company has a unique capability of tracking any specimen anywhere in the world from the point of pick up to its delivery at the laboratory.

SRL undertakes the following steps to make sure that the transportation of specimens is safe and secure. Diagnostic specimens are packed and transported within India and from across the globe as per international standards confirming to the IATA regulations. Extensive validation of each and every specimen type is done over varying periods and conditions of transit to ensure the specimen quality. Specimens are transported in the required controlled temperature/ cold chain conditions. Samples are packed with special designed packaging with the required quantity of gel packs or dry ice. Within India the time taken from the metro cities is 6 hours and from most other locations the time is 8 to 24 hours. From countries of south asia and middle east the time required is 24 hours. In essence, the quality testing services backed by efficient logistics management is creating a differentiation in its offerings and building customer base which is currently numbering over 10 million.

Based on above case study answer following questions. Make suitable assumptions and state these in the beginning of case

answers.

Questions

Q1: Discuss how logistics is used as a competitive advantage at SRL

Q2: What are the strengths and USP of SRL as far as its supply chain is concerned

Question 3

The following are rough financial figures for Best Buy in 2017 (in billions of dollars):

Metric	Best Buy
Inventory	6
Revenue	40
Cost of goods sold	30

- Compute the number of annual inventory turns for the Best Buy.
- Suppose it costs Best Buy \$1200 (COGS) for a TV set. Assume that the cost of inventory is 40% per year. What is the per-unit cost of inventory in each TV set?

Question 4 – Answer any 5 sub questions from (a) to (j)

ABC Corp. sells a product (product ID: SM-782) which has an annual demand of 7000. The ordering cost is \$200 per order. Inventory holding cost rate is 20 percent per year. The cost of each unit of SM-782 is \$1400. Assume 350 working days per year. Find the following:

- economic order quantity
- number of orders per year
- total annual cost of ordering + inventory holding (TC)
- cycle length (i.e., number of days between consecutive orders)
- How much is the maximum inventory?
- How much is the minimum inventory?
- The delivery lead time from the supplier is 2 days. What is the appropriate Reorder Point (ROP) for ABC?
- Suppose ABC is now sourcing the product from China, and the delivery lead time has increased to 24 days. What is the appropriate ROP now?
- ABC's current policy is to order 700 units at a time. What is the cost impact of this policy on ABC (i.e. how much money are they losing?)
- As part of its initiative to implement just-in-time (JIT) inventory management, the company wishes to reduce the size of each order to only 60. How much should it reduce the (fixed) ordering cost for an order of 60 units to be optimal?

Question 5

Demand for phones at **Amazon** is 10,000 per month. The holding cost at Amazon is 25 percent per year, and the company incurs a fixed cost of \$45,000 for each order placed. Consider the following price schedule offered by the supplier:

Quantity range	Price
0 to 20,000	\$300
20,000+	\$295

Assuming that the price schedule is based on the All-Units Discount, how many phones should Amazon order per replenishment? Hint: *start from the lower price, find the first realizable EOQ, then evaluate it and any price break to its right.*

Question 6

Weekly demand for paper towels at a **Target** store is normally distributed, with a mean of 1,000 and a standard deviation of 300. The supplier takes nine weeks to supply a Target order, which is for a batch size of 48,000. Target is aiming for a CSL of 97 percent and monitors its inventory continuously.

- a. How much safety inventory of paper towels should Target carry?
- b. What should its ROP be?
- c. If instead Target sets the ROP at 10,000, what is the implied CSL? What is the implied Fill Rate?

Question 6

Supply Chain scenario in the world is changing rapidly. How the emerging technology innovations will have impact on this scenario.

-----End of Paper-----

Standard Normal Loss Function Table, L(z)

z	-0.09	-0.08	-0.07	-0.06	-0.05	-0.04	-0.03	-0.02	-0.01	0.00
-4.0	4.0900	4.0800	4.0700	4.0600	4.0500	4.0400	4.0300	4.0200	4.0100	4.0000
-3.9	3.9900	3.9800	3.9700	3.9600	3.9500	3.9400	3.9300	3.9200	3.9100	3.9000
-3.8	3.8900	3.8800	3.8700	3.8600	3.8500	3.8400	3.8300	3.8200	3.8100	3.8000
-3.7	3.7900	3.7800	3.7700	3.7600	3.7500	3.7400	3.7300	3.7200	3.7100	3.7000
-3.6	3.6900	3.6800	3.6700	3.6600	3.6500	3.6400	3.6300	3.6200	3.6100	3.6000
-3.5	3.5900	3.5800	3.5700	3.5600	3.5500	3.5400	3.5301	3.5201	3.5101	3.5001
-3.4	3.4901	3.4801	3.4701	3.4601	3.4501	3.4401	3.4301	3.4201	3.4101	3.4001
-3.3	3.3901	3.3801	3.3701	3.3601	3.3501	3.3401	3.3301	3.3201	3.3101	3.3001
-3.2	3.2901	3.2801	3.2701	3.2601	3.2502	3.2402	3.2302	3.2202	3.2102	3.2002
-3.1	3.1902	3.1802	3.1702	3.1602	3.1502	3.1402	3.1302	3.1202	3.1103	3.1003
-3.0	3.0903	3.0803	3.0703	3.0603	3.0503	3.0403	3.0303	3.0204	3.0104	3.0004
-2.9	2.9904	2.9804	2.9704	2.9604	2.9505	2.9405	2.9305	2.9205	2.9105	2.9005
-2.8	2.8906	2.8806	2.8706	2.8606	2.8506	2.8407	2.8307	2.8207	2.8107	2.8008
-2.7	2.7908	2.7808	2.7708	2.7609	2.7509	2.7409	2.7310	2.7210	2.7110	2.7011
-2.6	2.6911	2.6811	2.6712	2.6612	2.6512	2.6413	2.6313	2.6214	2.6114	2.6015
-2.5	2.5915	2.5816	2.5716	2.5617	2.5517	2.5418	2.5318	2.5219	2.5119	2.5020
-2.4	2.4921	2.4821	2.4722	2.4623	2.4523	2.4424	2.4325	2.4226	2.4126	2.4027
-2.3	2.3928	2.3829	2.3730	2.3631	2.3532	2.3433	2.3334	2.3235	2.3136	2.3037
-2.2	2.2938	2.2839	2.2740	2.2641	2.2542	2.2444	2.2345	2.2246	2.2147	2.2049
-2.1	2.1950	2.1852	2.1753	2.1655	2.1556	2.1458	2.1360	2.1261	2.1163	2.1065
-2.0	2.0966	2.0868	2.0770	2.0672	2.0574	2.0476	2.0378	2.0280	2.0183	2.0085
-1.9	1.9987	1.9890	1.9792	1.9694	1.9597	1.9500	1.9402	1.9305	1.9208	1.9111
-1.8	1.9013	1.8916	1.8819	1.8723	1.8626	1.8529	1.8432	1.8336	1.8239	1.8143
-1.7	1.8046	1.7950	1.7854	1.7758	1.7662	1.7566	1.7470	1.7374	1.7278	1.7183
-1.6	1.7087	1.6992	1.6897	1.6801	1.6706	1.6611	1.6516	1.6422	1.6327	1.6232
-1.5	1.6138	1.6044	1.5949	1.5855	1.5761	1.5667	1.5574	1.5480	1.5386	1.5293
-1.4	1.5200	1.5107	1.5014	1.4921	1.4828	1.4736	1.4643	1.4551	1.4459	1.4367
-1.3	1.4275	1.4183	1.4092	1.4000	1.3909	1.3818	1.3727	1.3636	1.3546	1.3455
-1.2	1.3365	1.3275	1.3185	1.3095	1.3006	1.2917	1.2827	1.2738	1.2650	1.2561
-1.1	1.2473	1.2384	1.2296	1.2209	1.2121	1.2034	1.1946	1.1859	1.1773	1.1686
-1.0	1.1600	1.1514	1.1428	1.1342	1.1257	1.1172	1.1087	1.1002	1.0917	1.0833
-0.9	1.0749	1.0665	1.0582	1.0499	1.0416	1.0333	1.0250	1.0168	1.0086	1.0004
-0.8	0.9923	0.9842	0.9761	0.9680	0.9600	0.9520	0.9440	0.9360	0.9281	0.9202
-0.7	0.9123	0.9045	0.8967	0.8889	0.8812	0.8734	0.8658	0.8581	0.8505	0.8429
-0.6	0.8353	0.8278	0.8203	0.8128	0.8054	0.7980	0.7906	0.7833	0.7759	0.7687
-0.5	0.7614	0.7542	0.7471	0.7399	0.7328	0.7257	0.7187	0.7117	0.7047	0.6978
-0.4	0.6909	0.6840	0.6772	0.6704	0.6637	0.6569	0.6503	0.6436	0.6370	0.6304

-0.3	0.6239	0.6174	0.6109	0.6045	0.5981	0.5918	0.5855	0.5792	0.5730	0.5668
-0.2	0.5606	0.5545	0.5484	0.5424	0.5363	0.5304	0.5244	0.5186	0.5127	0.5069
-0.1	0.5011	0.4954	0.4897	0.4840	0.4784	0.4728	0.4673	0.4618	0.4564	0.4509
0.0	0.4456	0.4402	0.4349	0.4297	0.4244	0.4193	0.4141	0.4090	0.4040	0.3989

