



**Institute of Management
JK Lakshmipat University
Jaipur
END TERM EXAMINATION 2016**

MBA FT Sem-II
MM: 50 Marks

Course: Production & Operations Management
Time: 3 Hours
Subject code: MBA 2035

Instructions: Attempt any three questions from Section A. Section B is compulsory.

Section A

Q1A. Compare and contrast important elements of lean systems in manufacturing sector with service sector by taking appropriate examples. (5 M)

Q1B. Traditional buyer – supplier relationship revolves around financial considerations. Buyers and suppliers both try to get the best deals from their companies; often one's gain is the other's loss. Many firms today are valuing sustainable operations, which involves financial, environmental, and social responsibility. Explain how buyers-suppliers relationship is evolving in this new environment. (5 M)

Q2A. Read the statement mentioned below:

“Canon, A Japanese manufacturer of photographic equipment decided against off shoring and kept its manufacturing and new product development processes in Japan, which has relatively high labor costs. In contrast GM, Headquartered at US has a Joint venture with Shanghai Automotive Industry Corporation (SAIC) to produce cars in China”.

Given our discussion of Supply Chain Design in operations management course, explain why these two companies chose different approaches to their supply chains and how the approaches selected support their respective operations strategies (7 M)

Q2B. If the annual cost of goods sold is \$12,000,000 and the aggregate inventory is \$2,500,000

- a. What is the inventory turns ratio?
- b. What would be the reduction in average inventory if, through better materials management, Inventory turns were increased to 10 times per year?
- c. If the cost of carrying inventory is 20% of the aggregate inventory, what is the annual savings? (3 M)

Q3A. A local hospital with 50 beds declares that it is committed to provide care to patients arriving at the emergency unit in less than 15 minutes and it will never turn away patients who need to be hospitalized for further medical care. What medical implications does this commitment have for strategic operations management decision (decisions related to capacity, work force and finance)? (5 M)

Q3B. FedEx build its business on quick dependable delivery of items being shipped by air from one business to another. Its early advantages included global tracking of shipments using web technologies. The advancements of internet technology enabled competitors to become much more sophisticated in order tracking. In addition, the advent of web based businesses put pressure on increased ground transportation deliveries. Explain how this change in the environment has affected FedEx's operations strategy, especially related to competitors, which has strong hold on business to consumer ground delivery businesses. (5 M)

Q4A. The approaching festival season, Raman is scheduling to work 7 days a week for next 2 months. October's work for Raman consists of 5 jobs: A, B, C, D and E. Job A takes 5 days to complete and is due on day 10, Job B takes 10 days to complete and is due on day 15, Job C takes 2 days to process and is due on day 5, Job D takes 8 days to process and is due on day 12, Job E which takes 6 days to process and is due on day 8.

Apply following sequencing rule for the task:

- i) First come First serve
- ii) Earliest Due Date
- iii) Shortest Processing Time

Determine the average completion time, makespan and tardiness of each job under each sequencing rule. Should Raman process this work as is first come first serve? If not? What sequencing rule would you recommend to run? (6 M)

Q4B. When the following sequencing rule should be used:

- i) SPT
- ii) Johnson's rule
- iii) Due Date
- iv) Critical Ratio

(4 M)

Q5A. Ruchika established a mother's kitchen restaurant in Delhi five years ago. It featured the unique recipe for chicken; "Just like mother use to make" The facility is homely, with relaxed and friendly service. Business has been good during the past two years, for both lunch and

dinner. Customers normally wait 15 minutes to be served, although complaints about service delay have increased recently. Ruchika is currently considering expanding the current facility or opening a similar restaurant in the Sonapat (Haryana) which has been growing rapidly.

- i) What type of strategy plan must Ruchika make?
- ii) What environmental forces could be at work in Sonapat that Ruchika should consider?
- iii) What are the possible disincentives competence of mother's kitchen ? (5 M)

Q5B. A firm manager must decide whether to make or buy a certain item used in production of vending machines. Making the item would involve annual lease cost of Rs. 150,000. Cost in volume estimates are as follows:

	Make	Buy
Annual Fixed cost	150,000 Rs.	None
Variable cost per unit	60 Rs.	80 Rs
Annual Volume (units)	12,000	12,000

- i) Given these numbers, should the firm buy or make this item?
- ii) There is a possibility that volume could change in the future. At what volume would the manager be indifferent between making and buying? (5M)



Section B

Q6A. On the basis of the given Caselet (Improving Service Time at Dave's Burgers), answer the questions at the end of the case (10 M)

Q6B. A US postal service supervisor is looking for ways to reduce stress in the sorting department. With the existing arrangement, stamped letters are machine canceled and loaded into tubs with 375 letters per tub. The tubs are then pushed to postal clerks, who read and key zip codes into an automated sorting machine at the rate of 1 tub per 375 seconds. To overcome the stress caused when the stamp cancelling machine outpaces the sorting clerks, a pull based system is proposed. When the clerks are ready to process another tub of mail, they will pull the tub from canceling machine area.

How many tubs should circulate between the sorting clerks and the cancelling machine if 90,000 letters are to be sorted during an 8 hr shift, the safety stock policy variable is .18 and the average waiting time plus materials handling time is 25 minutes per tub? (5 M)

Q6C. Identify an industry in which expansionist strategy has generally been followed by most firms in the past. Under which conditions will it be better for a firm to follow the wait and see strategy rather than the expansionist strategy? Illustrate with an example of a firm or industry that has successfully done that. (5 M)

Improving service time at Dave's Burgers

Dave's Burgers is a fast-food restaurant franchise in Georgia, South Carolina, and North Carolina. Recently, Dave's Burgers has followed the lead of larger franchise restaurants like Burger King, McDonald's, and Wendy's and constructed drive-through windows at all its locations. However, instead of making Dave's Burgers more competitive, the drive-through windows have been a source of continual problems, and it has lost market share to its larger competitors in almost all locations. To identify and correct the problems, top management has selected three of its restaurants (one in each state) as test sites and has implemented a quality management program at each of them. A quality team made up of employees, managers, and quality specialists from company headquarters, at the Charlotte, North Carolina, test restaurant using traditional quality tools like Pareto charts, checksheets, fishbone diagrams, and process flowcharts, have determined that the primary problem is slow, erratic service at the drive-through window. Studies show that from the time a customer arrives at the window to the time the order is received averages 2.6 minutes. To be competitive, management believes service time should be reduced to at least 2.0 minutes and ideally 1.5 minutes.

The Charlotte Dave's Burgers franchise implemented a number of production process changes to improve service time at the drive-through window. It provided all employees with more training across all restaurant functions, improved the headset system, improved the equipment layout, developed clearer signs for customers, streamlined the menu, and initiated even-dollar (tax-inclusive) pricing to speed the payment process. Most importantly the restaurant installed large, visible electronic timers that showed how long a customer was at the window. This not only allowed the quality team to measure service speed but also provided employees with a constant reminder that a customer was waiting.

These quality improvements were implemented over several months, and their effect was immediate. Service speed was obviously improved, and market share at the Charlotte restaurant increased by 5%. To maintain quality service, make sure the service time remained fast, and continue to improve service, the quality team decided to use a statistical process control chart on a continuing basis. They collected six service time observations daily over a 15-day period, as follows:

Sample	OBSERVATIONS OF SERVICE TIME (MIN)					
	1	2	3	4	5	6
1	1.62	1.54	1.38	1.75	2.50	1.32
2	1.25	1.96	1.55	1.66	1.38	2.01
3	1.85	1.01	0.95	1.79	1.66	1.94
4	3.10	1.18	1.25	1.45	1.09	2.11
5	1.95	0.76	1.34	2.12	1.45	1.03
6	0.88	2.50	1.07	1.50	1.33	1.62
7	1.55	1.41	1.95	1.14	1.86	1.02
8	2.78	1.56	1.87	2.03	0.79	1.14
9	1.31	1.05	0.94	1.53	1.71	1.15
10	1.67	1.85	2.03	1.12	1.50	1.36
11	0.95	1.73	1.12	1.67	2.05	1.42
12	3.21	4.16	1.67	1.75	2.87	3.76
13	1.65	1.78	2.63	1.05	1.21	2.09
14	2.36	3.55	1.92	1.45	3.64	2.30
15	1.07	0.96	1.13	2.05	0.91	1.66

Construct a control chart to monitor the service at the drive-through window. Determine if your control chart can be implemented on a continuing basis or if additional observations need to be collected. Explain why the chart you developed can or cannot be used. Also discuss what other statistical process control charts Dave's Burgers might use in its overall quality-management program.



TABLE | FACTORS FOR CALCULATING THREE-SIGMA LIMITS FOR
| THE $\bar{x}$ -CHART AND R -CHART

Size of Sample (n)	Factor for UCL and LCL for $\bar{x}$ -Chart (A_2)	Factor for LCL for R -Chart (D_3)	Factor for UCL for R -Chart (D_4)
2	1.880	0	3.267
3	1.023	0	2.575
4	0.729	0	2.282
5	0.577	0	2.115
6	0.483	0	2.004
7	0.419	0.076	1.924
8	0.373	0.136	1.864
9	0.337	0.184	1.816
10	0.308	0.223	1.777