EASTERN UNIVERSITY, SRI LANKA
Faculty of Commerce and Management
Final Year/First Semester Examination in Business Administration - 2005/2006
(Proper / Repeat) (July/August 2007)
MGT 4023 Production and Quality Management

Answer all five (5) questions   Time: 03 hours

Q1. *Case Study:*

100 Yen Sushi House

Dr. Xuan V.T. tells of a meeting with two Japanese businessmen in Tokyo to plan a joint Vietnamese-Japanese conference to explore Japanese management systems. As lunchtime drew near, his hosts told him with much delight that they wished to show him the "most productive operation in Japan."

Xuan describes the occasion: "They took me to a sushi shop, the famous 100 Yen Sushi House, in the Shinzuku area of Tokyo. Sushi is the most popular snack in Japan. It is a simple dish, vinegared rice wrapped in different things, such as dried seaweed, raw tuna, raw salmon, raw red snapper, cooked shrimp, octopus, fried egg, etc. Sushi is usually prepared so that each piece will be about the right size to be put into the mouth with chopsticks. Arranging the sushi in an appetizing and aesthetic way with pickled ginger is almost an art in itself.

"The 100 Yen Sushi House is no ordinary sushi restaurant. It is the ultimate showcase of Japanese productivity. As we entered the shop, there was a chorus of 'Iratsai,' a welcome from everyone working in the shop – cooks, waitresses, the owner, and the owner's children. The house features an ellipsoid-shaped serving area in the middle of the room, where inside three or four cooks were busily preparing sushi. Perhaps 30 stools surrounded the serving area. We took seats at the counters and were promptly served with a cup of 'Misoshiru,' which is a bean paste soup, a pair of chopsticks, a cup of green tea, a tiny plate to make our own

sauce, and a small china piece to hold the chopsticks. So far, the service was average for any sushi house. Then, I noticed something special, there was a conveyor belt going around the ellipsoid service area, like a toy train track. On it I saw a train of plates of sushi. You can find any kind of sushi that you can think of from the cheapest seaweed or octopus kind to the expensive raw salmon or shrimp dishes. The price is uniform, however, 100 yen per plate. On closer examination, while my eyes were racing to keep up with the speed of the traveling plates, I found that a cheap seaweed plate had four pieces, while the more expensive raw salmon dish had only two pieces. I sat down and looked around at the other customers at the counters. They were all enjoying their sushi and slurping their soup while reading newspapers or magazines.

"I saw a man with eight plates all stacked up neatly. As he got up to leave, the cashier looked over and said, '800 yen, please.' The cashier had no cash register, since she can simply count the number of plates and then multiply by 100 yen. As the customer was leaving, once again we heard a chorus of 'Arigato Gosaimas' (thank you) from all the workers."

Xuan continues his observations of the sushi house operations: "In the 100 Yen Sushi House, Professor Tamura [one of his hosts] explained to me how efficient this family-owned restaurant is. The owner's daily operation is based on a careful analysis of information. The owner has a complete summary of demand information about different types of sushi plates, and thus he knows exactly how many of each type of sushi plates he should prepare and when. Furthermore, the whole operation is based on the repetitive manufacturing principle with appropriate 'just-in-time' and quality control systems. For example, the store has a very limited refrigerator capacity (we could see several whole fish or octopus in the glassed chambers right in front of our counter). Thus, the store uses the 'just-in-time' inventory control system. Instead of increasing the refrigeration capacity by purchasing new refrigeration systems, the company has an agreement with the fish vendor to deliver fresh fish several times a day so that materials arrive 'just-in-time' to be used for sushi making. Therefore, the inventory cost is minimum.

"... In the 100 Yen Sushi House, workers and their equipment are positioned so close that sushi making is passed on hand to hand rather than as independent operations. The absence of walls of inventory allows the owner and workers to be involved in the total operation, from greeting the customer to serving what is ordered. Their tasks are tightly interrelated and everyone rushes to a problem spot to prevent the cascading effect of the problem throughout the work process.

"The 100 Yen Sushi House is a labour-intensive operation, which is based mostly on simplicity and common sense rather than high technology, contrary to American perceptions. I was very impressed. As I finished my fifth plate, I saw the same octopus sushi plate going around for about the 30th time. Perhaps I had discovered the pitfall of the system. So I asked the owner how he takes care of the sanitary problems when a sushi plate goes around all day long, until an unfortunate customer eats it and perhaps gets food poisoning. He bowed with an apologetic smile and said, 'Well, sir, we never let our sushi plates go unsold longer than about 30 minutes.' Then he scratched his head and said, 'Whenever one of our employees takes a break, he or she can take off unsold plates of sushi and either eat them or throw them away. We are very serious about our sushi quality.' "

Questions:

1. Identify the operations strategies of 100 Yen Sushi House.

(07 Marks)

2. Prepare a service blueprint for the 100 Yen Sushi House operations.

(07 Marks)

3. What features of the 100 Yen Sushi House service delivery system differentiate it from the competition, and what competitive advantages do they offer?

(07 Marks)

4. Suggest other services in Vietnam that could adopt the 100 Yen Sushi House service delivery concepts.

(07 Marks)
(Total 28 Marks)

Q2.

(a) What are some of the major ways firms are meeting global competition?

(04 Marks)

(b) What recent changes have caused supply chain management to gain importance?

(04 Marks)

(c) How does the Quality Function Deployment (QFD) approach help to develop quality products? What are some limitations of the QFD approach?

(06 Marks)

(d) What are the costs associated with quality?

(04 Marks)

(Total 18 Marks)

Q3.

(a) What are the main advantages that quantitative techniques for forecasting have over qualitative techniques?

(03 marks)

(b) Given the following data:

Period	Number of Complaints
1	60
2	65
3	55
4	58
5	64

Prepare a forecast using each of these approaches:

i. A three-period moving average.

ii. A weighted average using weights of 0.50 (most recent), 0.30, and 0.20.

iii. Exponential smoothing with a smoothing constant of 0.40.

(06 marks)

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(c)   Explain the relationship between quality and productivity under the Lean System.

(05 marks)

(d)   Identify the relationship between product-process matrix?

(04 Marks)

(Total 18 Marks)

Q4.

(a)   How would you classify aggregate planning activities in terms of their time horizon, and identify the variables of production planning environment?

(04 Marks)

(b)   The "A" company produces two varieties of milk: milk "X" and milk "Y". Each is available in bags and bottles.

Currently, 3 machines that can package up to 150,000 bags each per year are available. Each machine requires 2 operators and can produce bags of milk "X" and milk "Y". Six bag machine operators are available.

Also five machines that can packages up to 250,000 bottles each per year are available. Three operators are required for each machine, which can produce bottle of milk "X" and milk "Y" Currently 20 bottle machine operators are available. Management would like to determine equipment and labour capacity for the next five years by using following data.

	Year				
	1	2	4	4	5
Milk "X"	60	100	150	200	250
Bags(000)	100	200	300	400	500
Bottle(000)					
Milk "Y"					
Bags(000)	75	85	95	97	98
Bottle(000)	200	400	600	650	680

(09 Marks)

(c) Consider the following data set:

Job sequence	Job operation time (days)	Job flow time (days)	Job due date (days)
A	5	5	6
B	17	22	20
C	14	36	18
D	9	45	12
E	10	55	12

by using shortest processing time (SPT) rule calculate the following:

i.   Average flow time,

ii.   Average number of jobs in the system each day,
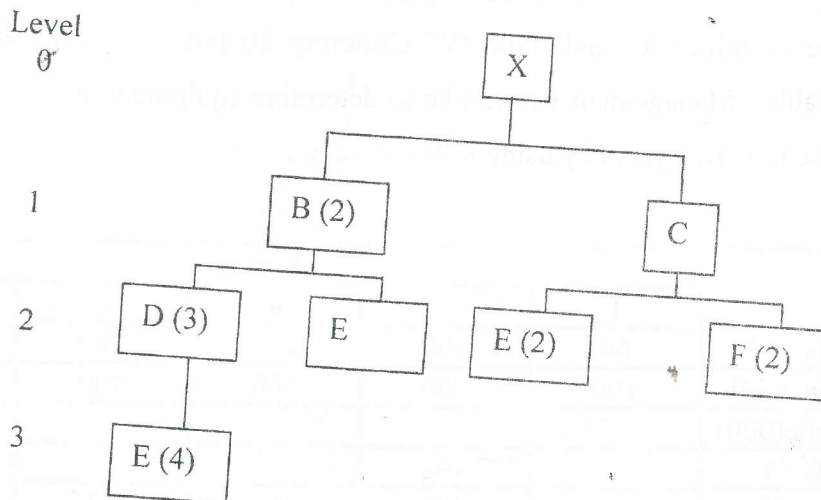
iii.   Average job lateness

(05 Marks)

(Total 18 Marks)

Q5.

(a)   Use the information presented in the following figure and answers the following questions.

A product structure tree for end item X

(i) Determine the quantities of B, C, D, E and F needed to assemble one X.

(ii) Determine the quantities of these components that will be required to assemble 10 Xs taking into account the quantities on hand (i.e., in inventory) of various components:

Component	On Hand
B	4
C	10
D	8
E	60

(b) A company is interested in balancing a production line that will manufacture an electronic football game to compete with the successful pocket-calculator size model of Mattel. Tasks, performance times, precedence relationships are shown:

(10 marks)

Task	Performance Time(seconds)	Must Follow
A	40	-
B	20	A
C	15	B
D	60	-
E	50	D
F	10	C
G	25	C
H	10	E
I	20	E
J	05	F,G,H,I
K	10	J

I. Construct a precedence diagram for the tasks.

II. To balance the line with a 60-second minimum cycle time, what is the theoretical minimum number of work stations? (A seven-hour day is worked).

III. Balance the line with longest operation time-rule, balancing to a 60-second cycle.

IV. What is the efficiency of the line?

(08 Marks)

(Total 18 Marks)