

MBA DEGREE EXAMINATIONS: APRIL 2014

(Regulation 2012)

Fourth Semester

MASTER OF BUSINESS ADMINISTRATION

MBA661: Facilities Planning and Design

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions

PART A (1 x 20 = 20 Marks)

1. **Case Study:- Toyota in China**

Toyota Motor Corp. entered the auto market in China in 1998 through a 50:50 joint venture with state owned First Automotive Works Corp. (FAW), China's biggest automobile manufacturer. Toyota is a late entrant in the Chinese market where Volkswagen and General Motors Corp. currently hold the no.1 and no.2 slots respectively.

The Toyota factory sits on a tiny plot of land alongside grimy FAW workshops near the north-eastern port city of Tianjin. With a capacity of just 1,00,000 cars annually, its small scale makes it something of a laboratory. The company feels as if the Chinese government has punished it for spurning a Chinese overture in the 1980's – when the Japanese company was busy expanding in the US.

Toyota preferred youngsters for the Tianjin plant in place of the FAW veterans, even though its operation stands in the shadow of the aging FAW factory. The average employee age is 21, which Toyota officials feel makes for a more malleable workforce, amenable to learning the 'Toyota way' teamwork, respect for authority and techniques of Kaizen or continuous improvement. Toyota needed to school its new employees quickly in the basics of auto manufacturing and assembly. As the opening day of the Tianjin factory in October 2002 drew closer, it became clear that the workers lacked a skill even more fundamental than the precision welding, bolting, and fine tuning required to build cars that meet Toyota's stiff quality standards. Most of the employees had never driven a car in their lives.

Ever resourceful, Toyota's managers placed a stripped-down demonstration of its Vios Subcompact on the factory floor to let workers get the feel of the machines they were building. The company despatched a score of experienced technical hands from its most productive Japanese plants to serve as factory drill sergeants in Tianjin, as part of the effort to teach 'Toyota 101' to the 1300 odd workers at the Vios plant. At Tianjin, assembly line staffers had to build their own work benches, component bins and trolleys from kits shipped from Japan to learn

teamwork and responsibility. Months before the first Vios rolled off the line, the teams practiced assembling and taking apart prototypes over and over again. All the new employees had to go through a week long programme of seminars on the Toyota culture and wrist exercises to build up muscles for the assembly line.

The Tianjin plant does not have the same level of automation as the company's Japanese factories, despite it being Toyota's newest plants in China. Toyota did not import state-of-the-art robots and other expensive equipments from Japan. Instead the company relied heavily on manual assembly, in part because labour in China is much cheaper, but also because Toyota wants its Chinese workers to learn how to do things by hand first. The company feels that if too much automation is introduced in a plant too soon, quality can suffer because workers do not get a chance to learn from their mistakes. Though the company officials say that in some countries, Toyota has never been able to reach the quality levels of Japan, in Tianjin, Toyota's goal is nothing less than matching the quality of Japanese factories or even exceeding it.

By 2003, Vios had become so popular that the company had a backlog of 16,000 orders in China. For the Tianjin plant, so far the going has been slow as the company has built only 1,500 Vios sedans per month since production commenced in October 2002. This is largely because it has taken time for workers to master the kind of meticulous workmanship Toyota demands. In 2002, Toyota had to import 50,000 odd cars from Japan to be sold in China in contrast to Volkswagen which sold 5,11,000 and GM which sold 1,10,000. With the success of the Tianjin facility, Toyota has earned plenty of goodwill from Beijing and has been given the nod to build a second larger factory across town which it hopes to open in 2005.

Questions:

- a) Discuss the major advantages and disadvantages of Tianjin as a location for Toyota's maiden venture in China. (10)
- b) Could Toyota have avoided delays in full-swing production at Tianjin due to unskilled workforce by hiring most of the FAW veterans? (10)

Answer ALL the Questions:-

PART B (10 x 2 = 20 Marks)

- 2. What are the repercussions if location of a facility is not planned at all?
- 3. How will you evaluate and select the best plant location based on break-even point?
- 4. Write a short note on CRAFT.
- 5. State the objectives of a good plant layout.
- 6. What is a cellular layout?
- 7. What is meant by assembly line balancing?
- 8. State the principles of material handling.

9. State the advantages of using ASRS in an industry.
10. What is meant by unit load concept?
11. Write a brief note on packaging.

(OR)

PART C (4 x 15 = 60 Marks)

12. a) (i) Explain the factors that influence plant location with examples. (7)
- (ii) Explain the methods to evaluate different plant locations. (8)

(OR)

- b) Explain the types of layout indicating their merits and demerits with neat sketches.
13. a) Explain the different types of material handling equipments with their applications.

(OR)

- b) Discuss production flow analysis with a diagram.
14. a) (i) ABC Limited is evaluating 3 cities for a new plant designed to produce a product which will sell for Rs.170/= each. The economic portion of a plant location study shows the following cost and market data:

Cost data	City A	City B	City C
Fixed costs per year	Rs.3,00,000	Rs.2,00,000	Rs.1,50,000
Variable cost per unit	Rs.30	Rs.45	Rs.65

Market data	
Volume	Probability
4500	0.1
5500	0.3
6500	0.6

Which city should be selected based on the given volume estimate? (10)

- (ii) What is the break even volume for the city selected? (5)

- b) Find the balance delay when the required production in a shift of 8hours is 80 units.

Activity	A	B	C	D	E	F	G	H
Preceding activity	----	----	A	A	B,C	D	E	F
Duration in minutes	5	2	3	3	6	4	5	1

15. a) Discuss the important factors to be considered for planning the service facilities for banking.

(OR)

- b) Redesign the service facilities for a department store with the help of a suitable diagram.
