

TRIBHUVAN UNIVERSITY
FACULTY OF MANAGEMENT

Office of the Dean

2015

Full Marks: 60

Time: 3 Hrs.

BIM / Sixth Semester / MGT 205: Operations Management

Candidates are required to give their answers in their own words as far as practicable.

Group "A"

Brief Answer Questions:

[10 × 1 = 10]

1. What is intermittent production system?
2. What is design capacity?
3. Give concept on group technology.
4. What do you mean by planned order and open order?
5. Write about center of gravity method.
6. What are 5M of operations resource?
7. Give any four characteristics of continuous production system.
8. What is slack variable and why it is used in LPP?
9. Define unbalanced transportation problem.
10. List four objectives of operations management.

Group "B"

Short Answer Questions:

[6 × 5 = 30]

11. Differentiate between the Preventive and Break down maintenance. How do you make an analysis of trade off between preventive and break down maintenance? Justify your answer graphically.
12. Why location decision is strategic decision? What are the factors that affect location decision?
13. What do you mean by operations strategy? Describe the most common competitive priorities adopted by modern business organizations.
14. Given is the following information:
 - i) Profit of product A : Rs 6 per unit
Profit of product B : Rs 5 per unit
 - ii) Production of products A and B are limited by the capacity of 120 hours per week in polishing and 40 hours in plating.
 - iii) Production time requirements (hour per unit)

	Product A	Product B
Polishing	3	4
Plating	2	1

- iv) Production of A and B products can never in negative.

Solve the problem by simplex method for maximization of profit.

15. A company has three jobs to be done on three machines. Each job must be done on one and only one machine. The cost of each job on each machine is given in the following table:

Jobs	Machines		
	M ₁	M ₂	M ₃
J ₁	25	31	35
J ₂	15	20	24
J ₃	22	19	17

Make the optimal assignment.

16. The production department of a company requires 3600kg of raw materials for manufacturing a particular item per year. It has been estimated that the cost of placing an order is Rs 36 and the cost of carrying inventory is 25 percent of the investment in the inventories. The price is Rs 10 per kg. Purchase manager wishes to determine an ordering policy for the raw material. Recommend the manager in the following aspects:
- The optimal lot size
 - The optimal reorder time.

Group "C"

Comprehensive answer questions:

[4 × 5 = 20]

17. Read the following case carefully and answer the following questions.

Harley-Davidson Motorcycle Company was established in the year 1903. It soon became a leading manufacturer of motorbikes in the US and the neighboring countries. After World War II, Harley-Davidson had a monopoly in the motorbikes market due to the closure of its main rivals. It was easy, therefore, for the company to increase its market share and production, but the quality of the product became a secondary consideration. The problems for Harley-Davidson started only when Honda entered the US market and started to cut into its market share. Using the total quality management principles of Edward Deming, Honda's products were increasingly better in terms of quality at a time when Harley-Davidson's products were low on the quality front. By 1981, Honda almost pushed Harley-Davidson to the verge of closure.

The management of Harley-Davidson was wondering how Honda was able to manufacture motorbikes much better in quality and at a much lesser cost compared to its products. Initially it attributed this to the cheap Japanese labor, huge advertising budgets, and dumping practices on part of Honda. Over a period of time, Harley officials found the three real reasons for Honda's success-kaizen, just-in-Time (JIT), and extensive use of statistical methods to measure quality. Using JIT, Honda was turning its inventory 20-30 times a year compared to Harley-Davidson and other American companies at that time, who were turning their inventory only four times a year. Harley had by now understood how fewer inventory turns affect product cost and quality. Earlier in 1978, it had tried to implement the quality circles concept in its organization, but could not sustain it for a long time, in complete contrast to Kaizen's continuous improvement concept evolved and successfully implemented by Japanese companies.

The top management of Harley-Davidson was very conscious of employee involvement programmes having had a bad experience with quality circles. They did not want to thrust upon their workers various types of programmes for inventory reduction, quality improvement, work methods improvement, cost reduction, etc. simultaneously leading to confusion. Instead, they focused on a single most important agenda-quality. They felt that this umbrella term contained in an implicit way all the other improvement programmes. This simple goal of achieving quality in all spheres of activity was something which every worker could relate to easily. Improving quality everything you do give a sense of pride and commitment. Harley-Davidson's managers were focused on their goal of quality that they were not opposed to making investments in or improve the quality of their product. If new equipment could increase productivity and quality

addition to fostering a climate of continuous improvement, the company would go for it even without financial justification.

Another important decision on the part of Harley-Davidson officials was not to send rigid rules and regulations to their multiple facilities with diverse manufacturing environments. It was felt that doing so will kill employee participation in the quality initiative. The management provided the plant managers only with the direction in which the company was willing to go and told them the principles and concepts to be applied, but gave them the freedom to do it in their own way. This was a drastic shift from the white-collar and blue-collar discrimination existing in American companies at that time.

A typical example of this radical change in the thinking of top management can be demonstrated with an example of the company's plant at York. The company wanted to have the paint facility enclosed at the plant to keep it cleaner and have proper lighting. The employees made the designs of the enclosures themselves and asked the management if they could choose the color of its walls. The usual response would have been that we have to follow the standard color scheme, but the management responded with consent to the workers' request. This resulted in a clear demonstration of the management's commitment to change and the workers reciprocated in the same way.

Harley-Davidson started the employee involvement group (EIG) in order to solve quality problems. It was the same quality circles programme which was a disaster earlier. This time the company gave workers the liberty to choose a suitable name for the concept. The employees at the Milwaukee engine plant opted for 'quality circles', while the York assembly plant workers decided to call this as 'employee involvement groups'. Now, the company has a full-fledged employee involvement programme, in which the company formally trains employees in problem-solving, though participation is voluntary. Harley-Davidson does not quantify the cost benefits as a result of these EIGs, as it does not want to shift the company's focus from quality to cost reduction. Harley's turnaround has been highlighted in a big way in terms of its financial recovery and manufacturing improvements, though what is not reported is the vision of Harley-Davidson in promoting employee involvement.

Required:

- a. Is it right on the part of Harley-Davidson to focus only on quality improvement by even overlooking cost considerations?
- b. Up to what extent has Harley-Davidson been successful in the international and domestic US market compared to Honda according to you?
- c. Is the EIG a unique innovation of Harley-Davidson?
- d. What other quality management tools Harley-Davidson can apply for increasing quality? Explain.

