

GUJARAT TECHNOLOGICAL UNIVERSITY
MBA-SEMESTER-II-EXAMINATION- SUMMER-2024

Subject Code: 4529205**Date: 13/06/2024****Subject Name: Production & Operations Management****Time: 10:30 AM TO 01:30 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of simple calculators and non-programmable scientific calculators are permitted.

- Q.1** Definitions / terms / explanations / short questions based on concepts of theory/practical **14**
- (a) Dummy Activity with diagram
 - (b) Kaizen
 - (c) Line Balancing
 - (d) PDCA Cycle
 - (e) Control Charts
 - (f) Expediting
 - (g) EOQ

- Q.2** (a) Describe the factors that should be taken into account in deciding the location of plant? **07**
- (b) What is Plant Layout? Write about any two types of plant layout. **07**

OR

- (b) In a factory, there are 6 jobs to perform each of which should go thro' two machine : m/c A and m/c B in the order A->B. The processing timing in hours for the job is given. You are require to determine the sequence for performing the job and total time that would minimize the total elapsed time. Also find idle time. **07**

Job	A	B	C	D	E	F
Time on m/c A	7	4	2	5	9	8
Time on m/c B	3	8	6	6	4	1

- Q.3** (a) Illustrate the different types of manufacturing process. Explain any one in detail with its pros and cons. **07**
- (b) ABC corp. has got demand for parts is 10,000 units per year. The cost of product is Rs 2. It has cost Rs 36 to place a order and to process the delivery. Carrying cost is estimated at 9% of avg. inventory. Determine : 1) EOQ 2) Optimum no of order to be placed per year 3) Minimum total cost of inventory per year. **07**

OR

- Q.3** (a) Define Aggregate Production Planning. Discuss various strategies of Aggregate Production Planning. **07**
- (b) Quick Lube Inc. operates a fast lube & oil change garage. On a typical day, customers arrive at the rate of 3 per hr & lube jobs are performed at an average rate of one every 15 mins. The mechanics operates as a team on one car at a time. Find **07**
- Utilization of the lube team
 - The average no of cars in line
 - The average time a car waits before it is lubed
 - The total time it takes to go thro' the system

- Q.4** (a) What do you mean by Six Sigma ? Describe the various analytical tools associated with Six **07**

Sigma.

- (b) A sample is taken every hour. Sample range & sample average of 8 samples are given in the table. Each sample contain 6 units of the product. Calculate control limits for R chart and X chart. ($D3=0$, $D4=2$, $A2=0.48$) 07

Sample	Sample Range	Sample Average
1	0.52	5.11
2	0.66	5.27
3	0.55	5.10
4	0.59	4.92
5	0.67	5.04
6	0.73	5.09
7	0.64	5.11
8	0.55	4.99

OR

- Q.4 (a) What is ISO certification series? Discuss 07
(b) From the following 07

- 1) Draw network diagram and find out critical path.
- 2) Calculate EST, LST, EFT, LFT and Slack time.

Activity	Predecessor	Duration
A	-	1
B	A	4
C	A	3
D	A	7
E	B	6
F	C,D	2
G	E,F	7
H	D	9
I	G,H	4

Q.5 **Case Study : Gillette's Total Quality Management System** 14

Gillette began its global operations in 1905 when it opened a manufacturing plant in Germany. This global strategy and success saw the firm extending its operation to Latin America. Argentina was a potential market after tariffs and business policies were revised. Having operated under unfavorable regime, the firm perceived future competition and decided to create competitive advantages. Key figures in the firm such as Carlos Rotundo and Jorge Micozzi suggested better quality as the solution to the market issues. The management had to change the organizational culture which was not strategic for the future market circumstances. Rotundo had already began creating a new organizational culture when Micozzin came up with the idea of total quality management (TQM) that made Gillette Argentina the most successful affiliate in Latin America.

Gillette gets employees to take on the new system

In a firm where decision making is solely the responsibility of leaders such that the employees have to act as the subjects to them, it is likely that the employees would not readily accept the adoption of total quality management (TQM). This is because TQM requires them to take higher roles, become self-dependent and consider themselves as the owners of the firm.

It is apparent that Gillette had earlier managed its activities in a manner that left the managerial roles such as decision making and steering initiatives exclusively to the leaders. Therefore, the effort to adopt TQM compelled leaders to take measures that would prepare the employees better for the change. These measures involved several initiatives especially triggered by several key figures in the firm.

The very first initiative Gillette took was to hire the Organizational Dynamics Inc (ODI) as a consulting and training firm. The firm became the key source of information and motivation for the Gillette Latin America management. It can be argued that the source of a successful organizational change begins with leaders who in turn transfer it to employees. This means that the employees would rarely have accepted an initiative that their leaders did not support appropriately. The consulting firm played a central role in preaching the benefits of TQM to the leaders. Indeed, the firm reinforced the idea Rotundo had already started to instill in Argentina. Organizational Dynamics Inc. developed the quality initiative and recommended the creation of a quality structure.

Secondly, Gillette offered training to the employees as a way of preparing them for TQM system. One of the landmark training was FADE that prepared employees for quality action teams. The specialized training involved four phases of problem solving: focus, analyze, develop and execute.

The focus phase was concerned with the development of a problem statement; the analyze phase dealt with the use of data to understand the magnitude of the problem; the develop phase involved the determination of a solution and implementation plan; and the execute phase was about implementing the plan and measuring its impact. In addition to FADE training, the employees received training in seven basic quality tools as well as brainstorming, force field analysis and cost benefit analysis.

Furthermore, training was extended to management and leadership levels. The Argentine directors, managers and other officials were trained by ODI as trainers of the rest of the organization. The teams were allocated facilitators who received training on leadership development. Team leaders were trained in areas relating to group dynamics, effective meetings, leadership skills and group conflicts .As a matter of fact, training was the backbone of the TQM process. Most of the members who got training became experts in their respective areas and eventually steered the process towards success.

Another way that Gillette used to prepared employees for the TQM process was through workshops. Through the leadership of Walker, workshops were conducted with all employees to inform them about the changes that would take place. The staff got information about the new working style and culture to be attained through TQM.

Team sponsors were identified and their roles explained to the staff. They were to support the teams in any way needed including helping them to attain their objectives with recognition of their empowerment. Other workshops that Walker would offer involved problem-solving and statistical analysis, and at the same time inspiring everyone.

Finally, Gillette endeavored to meet the challenges of quality that the employees faced. The newly hired quality manager emerged to be a successful preparer of the team members and organizer of TQM process.

Questions :

- (a) Examine and analyze the main purpose of Total Quality Management. **07**
- (b) Identify and describe the seven key pillars of total quality management. In your view which pillars from the seven is followed by this organization (Gillette). **07**

OR

- (a) Explain Employee Involvement. What are the advantages and disadvantages of employee involvement in decision making? **07**
- (b) In addition to those already discussed in the case, explain various other quality tools that could be utilized by the company. **07**
