

GUJARAT TECHNOLOGICAL UNIVERSITY
MBA – SEMESTER IV – EXAMINATION – SUMMER 2024

Subject Code: 4549285**Date: 25/04/2024****Subject Name: World Class Manufacturing****Time: 10:30 a.m. to 05:30 p.m.****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

| Q. No. | Question Text and Description | Marks |
|---------------|---|--------------|
| Q.1 | Explain the following concepts in brief : a) SOPs b) Bottleneck Analysis c) Force Field Analysis d) Poka- Yoke e) Muri, Mura and Muda f) Value Stream Mapping g) Six Sigma | 14 |
| Q.2 | (a) Discuss the principles of WCM and the importance of implementing WCM in industries to gain competitive advantage. Give suitable examples to explain how. | 07 |
| | (b) Explain Toyota Production Systems (TPM) . Explain it's importance and application giving suitable examples. | 07 |
| OR | | |
| | (b) Discuss the steps of 5S and the linkages between them. What are the benefits of developing a 5S culture in organizations. Give suitable examples. | 07 |
| Q.3 | (a) What do you understand by Lean Production? List the key tools of Lean Production and explain any two in brief. Give suitable examples . | 07 |
| | (b) What is meant by Hoshin Kanri ? Discuss it's core principles and how each of these ensure organizational growth . Give suitable examples. | 07 |
| OR | | |
| Q.3 | (a) Explain Agile Manufacturing as an emerging strategic approach . List down the key elements of Agile manufacturing and explain any two in brief. | 07 |
| | (b) What is meant by Short Interval Control ? Discuss the importance of using Short Interval Control from the operational and strategic perspectives. Give suitable examples. | 07 |
| Q.4 | (a) What do DMAIC and DMADV stand for ? What is the difference between the two? Explain giving practical examples. | 07 |

- (b) Discuss the meaning, importance and application of the following: 07
i) Fixed Automation System
ii) Flexible Automation System
iii) Programmable Automation System

OR

- Q.4** (a) What does FMEA stand for? Discuss the various steps of FMEA and how they help in achieving Six Sigma. Give suitable examples. 07
- (b) Discuss the importance of Motivation, Employee Involvement and Organisational Learning in WCM optimization, Give suitable examples. 07

Q.5

CASE STUDY:

XYZ Manufacturing, a mid-sized automotive parts manufacturer, faced challenges typical of many traditional factories: high inventory levels, inconsistent production flow, frequent defects, and prolonged lead times. Recognizing the need for change, the company embarked on a journey to implement World Class Manufacturing practices.

XYZ Manufacturing embraced the core principles of TPS, including Muri, Mura and Muda. They introduced Just-In-Time (JIT) production to reduce inventory levels, implemented Kanban systems to streamline material flow, and adopted Jidoka to empower workers to stop the production line when abnormalities occur. These efforts aimed to optimize production processes and enhance overall efficiency.

In addition to TPS, XYZ Manufacturing integrated Lean Manufacturing techniques such as 5S, Andon, Bottleneck Analysis, and SMED (Single-Minute Exchange of Die). Through 5S initiatives, they organized workspaces for improved efficiency and safety. Andon systems were implemented to enable real-time communication of production issues, while Bottleneck Analysis helped identify and address constraints in the production line. SMED reduced changeover times, allowing for more flexible and responsive manufacturing.

To further enhance quality and process improvement efforts, XYZ Manufacturing engaged a consultant to implement Six Sigma using the DMAIC methodology. This approach facilitated data-driven decision-making and root cause analysis, leading to targeted improvements in product quality and operational efficiency.

Central to XYZ Manufacturing's success was the establishment of a culture of continuous improvement. Regular Gemba walks encouraged frontline employees to identify opportunities for optimization, while Kaizen events facilitated the implementation of small, incremental changes aimed at driving ongoing improvements across the organization.

The implementation of World Class Manufacturing principles yielded significant results for XYZ Manufacturing. Lead times were reduced, inventory levels decreased, and defects were minimized, leading to improved customer satisfaction and increased profitability. The company's ability to adapt to changing market demands and maintain high standards of quality positioned them as a leader in the industry.

Answer the following based on the above case:

- (a) As the company is involved in reducing the waste (Muda), elaborate which are the Seven Deadly Wastes present in any manufacturing organization? 07

- (b) Elaborate on 5S activities that XYZ would have implemented for organized workspace to improve efficiency and safety. **07**

OR

- Q.5** (a) Total Employee Involvement is fundamental to all WCM companies. Describe which activities increase the involvement of employees at workplace and improve operations **07**

- (b) As the company is implementing Six Sigma, specify the Defects per Million opportunities (DPMO) to target at to achieve six sigma level? What exactly is done in the 'Define' Phase of DMAIC and which tools do you suggest? **07**
