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| **Name:**<br>**Enrolment No:** | UPES<br>UNIVERSITY OF TOMORROW |

**UPES**
**End Semester Examination, Dec 2024**

**Programme Name : MBA LSCM** **Semester : III**
**Course Name : Lean Supply Chain Management** **Time : 03 hrs**
**Course Code : LSCM 8012** **Max. Marks: 100**
**No. of page(s) : 03**

**SECTION A**
**10Qx2M=20Marks**

| S. No. | | Marks | CO |
|---|---|---|---|
| Q 1 | **Mention statement True or False**<br><br>A. The Toyota Production System (TPS) was developed in post-World War II Japan to address resource scarcity.<br>B. Just-in-Time (JIT) aims to produce items only as they are needed, minimizing inventory.<br>C. Heijunka helps to smooth out production schedules and avoid overproduction or shortages.<br>D. Jidoka combines automation with human intelligence to stop machines automatically when an abnormality is detected.<br>E. The Kaizen principle focuses solely on top-down improvements initiated by management.<br>F. Lean Manufacturing is an adaptation of TPS principles to various industries beyond automotive manufacturing.<br>G. Overproduction is considered one of the seven deadly wastes in Lean Manufacturing.<br>H. Value Stream Mapping (VSM) is used to identify value-adding and non-value-adding activities in a process.<br>I. Pull production in Lean is based on actual customer demand, unlike traditional push production which is based on forecasts.<br>J. Lean Manufacturing prioritizes high inventory levels to buffer against uncertainty. | **20** | **CO1** |

**SECTION B**
**4Qx5M= 20 Marks**

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| Q 2 | How can the 5S methodology be applied to a service industry such as a restaurant or a bank? | **5** | **CO2** |
| Q 3 | What are the main objectives of Lean Manufacturing? | **5** | **CO2** |

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| Q 4 | Explain the concept of Value Stream Mapping (VSM) and its significance in Lean Manufacturing. | **5** | **CO2** |
| Q 5 | What is the role of standardization in Lean Manufacturing, and how does it contribute to efficiency? | **5** | **CO3** |
| **SECTION-C**<br>**3Qx10M=30 Marks** | | | |
| Q 6 | Compare and contrast Lean Manufacturing with traditional mass production methods, focusing on key differences in inventory management, quality control, and employee roles. | **10** | **CO3** |
| Q 7 | How does the Lean philosophy of eliminating waste (Muda) differ from traditional cost-cutting measures? Provide examples to illustrate your points. | **10** | **CO2** |
| Q 8 | Discuss the role of leadership in successfully implementing Lean principles in an organization. What qualities should leaders possess to drive Lean initiatives?<br><br>OR<br><br>Explain how the 5S methodology can be applied to a healthcare setting to improve efficiency and patient safety. | **10** | **CO4** |
| **SECTION-D**<br>**2Qx15M= 30 Marks** | | | |

**Case Study: Tesla's Struggle for Lean Production**

**Introduction:**

In 2017, Tesla, the pioneering electric vehicle (EV) manufacturer, faced a significant challenge at its Gigafactory 1 in Nevada. While aiming to ramp up production of its Model 3 sedan to meet surging demand, the company encountered unexpected bottlenecks in its battery module assembly line. This case study delves into the challenges Tesla faced, the root causes of the production issues, and the steps taken to overcome them, highlighting the importance of lean principles in a high-tech manufacturing environment.

**Background:**

Tesla, founded in 2003, had revolutionized the automotive industry with its focus on electric vehicles and sustainable energy. The Gigafactory 1, a massive battery production facility, was crucial to Tesla's ambitious plans to make electric cars affordable and accessible to the masses. However, the complexity of battery module assembly and the pressure to ramp up production quickly led to unexpected problems.

**The Problem/Challenge:**

Tesla's Gigafactory 1 experienced a bottleneck in the battery module assembly line, where automated robots and human workers were struggling to keep pace with production targets. This resulted in:

- **Production Delays:** The Model 3 production ramp-up was significantly delayed, leading to frustrated customers and concerns among investors.
- **Increased Costs:** The bottlenecks caused inefficiencies and increased production costs, impacting Tesla's profitability.
- **Quality Issues:** The rush to meet production goals led to quality control issues, with some battery modules needing rework or replacement.

**Stakeholders and Their Interests:**

- **Tesla:** Interested in achieving its production targets, maintaining profitability, and upholding its reputation for innovation.
- **Customers:** Eager to receive their Model 3 orders but frustrated by delays.
- **Investors:** Concerned about the impact of production delays on Tesla's financial performance and stock price.
- **Employees:** Under pressure to meet demanding production goals while ensuring quality.

**Alternatives:**

1. **Increase Automation:** Invest in more advanced automation and robotics to increase production speed and reduce reliance on human labor.
2. **Optimize Workflow:** Analyze the assembly process to identify bottlenecks and inefficiencies, and redesign the workflow to improve throughput.
3. **Cross-Training:** Train employees to perform multiple tasks, increasing flexibility and reducing downtime caused by absenteeism or unexpected issues.
4. **Quality Control:** Implement stricter quality control measures to catch defects early in the production process.

**Decision and Implementation:**

Tesla decided to adopt a multifaceted approach, combining increased automation with process optimization and employee training. The company invested in new robotic equipment, redesigned the assembly line layout, and cross-trained employees to handle different tasks. They also implemented rigorous quality control measures to ensure that every battery module met Tesla's high standards.

**Outcome and Conclusion:**

Tesla's efforts to address the bottleneck were successful. Production gradually ramped up, and the company was able to meet its Model 3 production targets. The experience highlighted the importance of applying lean principles in a high-tech manufacturing environment. By identifying and addressing bottlenecks, optimizing workflows, and empowering employees, Tesla was able to overcome the challenges and achieve its goals.

**ANSWER BELOW QUESTIONS**

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| Q 9 | Critically analyze Tesla’s decision to balance increased automation with employee cross-training to resolve its production bottlenecks. Discuss the pros and cons of this approach. How does Tesla’s experience | **15** | **CO4** |

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| | demonstrate the need for flexibility and adaptability in high-tech, fast-paced manufacturing environments? | | |
| Q 10 | How can data analytics be used to identify bottlenecks in complex manufacturing systems like Tesla's Gigafactory?<br>Discuss how companies can use real-time data to drive decision-making and continuous improvement. Provide examples of metrics that would be critical in identifying and resolving production issues.<br><br>OR<br><br>In your view, could Tesla have adopted an alternative strategy to overcome its production challenges?<br>Evaluate the potential for a hybrid model that integrates both vertical integration and outsourcing, or alternative process re-engineering strategies, to resolve the bottlenecks. What are the risks and benefits of these alternatives? | **15** | **CO4** |