

**SNS College of Technology, Coimbatore-35**  
**(Autonomous)**  
**19AUZ405 – LEAN MANUFACTURING**  
**2 Mark Questions**

1. What is lean manufacturing?
  - Lean manufacturing is a systematic approach to identifying and eliminating waste in all aspects of production processes to enhance efficiency and value for customers.
2. Who developed the concept of lean manufacturing?
  - Lean manufacturing principles were developed primarily by Toyota Motor Corporation, inspired by the Toyota Production System (TPS).
3. Define waste in the context of lean manufacturing.
  - Waste, known as "Muda" in Japanese, refers to any activity or process that consumes resources but does not add value to the end product or service.
4. What are the seven types of waste in lean manufacturing?
  - The seven types of waste are overproduction, waiting, transportation, inappropriate processing, excess inventory, unnecessary motion, and defects (abbreviated as TIMWOOD).
5. What is the primary goal of lean manufacturing?
  - The primary goal of lean manufacturing is to maximize customer value while minimizing waste.
6. What is the role of continuous improvement in lean manufacturing?
  - Continuous improvement, or Kaizen, is fundamental to lean manufacturing, emphasizing ongoing efforts to enhance processes, products, and systems incrementally.
7. What is Just-in-Time (JIT) manufacturing?
  - Just-in-Time manufacturing is a production strategy aimed at delivering the right quantity of parts or products to the right place at the right time, thereby minimizing inventory and associated costs.
8. What is the significance of Kanban in lean manufacturing?

- Kanban is a visual scheduling system used in lean manufacturing to control and manage workflow, inventory levels, and production processes effectively.
9. Define value stream mapping.
- Value stream mapping is a lean manufacturing technique used to analyze, visualize, and improve the flow of materials and information required to bring a product or service to a customer.
10. How does 5S methodology contribute to lean manufacturing?
- 5S methodology (Sort, Set in Order, Shine, Standardize, Sustain) helps create a clean, organized, and efficient work environment conducive to lean principles by eliminating waste and improving productivity.
11. What is the concept of "pull" in lean manufacturing?
- The concept of "pull" involves producing goods or services based on customer demand rather than pushing them through the production process based on forecasts or schedules.
12. How does Total Productive Maintenance (TPM) support lean manufacturing?
- Total Productive Maintenance aims to optimize equipment effectiveness by involving all employees in the maintenance process, thereby reducing downtime and enhancing overall equipment efficiency (OEE).
13. What is the role of standardized work in lean manufacturing?
- Standardized work defines the most efficient methods for completing tasks, ensuring consistency, quality, and continuous improvement throughout the production process.
14. How does lean manufacturing promote employee involvement?
- Lean manufacturing encourages employee involvement by empowering workers to identify and solve problems, participate in decision-making processes, and contribute to continuous improvement efforts.
15. Define Heijunka in lean manufacturing.
- Heijunka is a production leveling technique used to balance and smooth workflow by producing a consistent mix of products or services over a specified time period, helping to minimize fluctuations and waste.
16. What is the purpose of a Value Stream Analysis (VSA)?

- The purpose of a Value Stream Analysis is to identify value-adding and non-value-adding activities within a process, helping organizations streamline operations and eliminate waste.
17. Explain the concept of "jidoka" in lean manufacturing.
- Jidoka, also known as autonomation, refers to the principle of designing processes to automatically detect and stop abnormalities, defects, or equipment malfunctions, preventing the production of defective products.
18. How does Single-Minute Exchange of Die (SMED) contribute to lean manufacturing?
- Single-Minute Exchange of Die is a lean manufacturing technique aimed at reducing setup or changeover times to enable quick and efficient switching between different production tasks or products.
19. What is the role of Visual Management in lean manufacturing?
- Visual Management involves using visual cues, such as signs, labels, and displays, to communicate information effectively, improve transparency, and facilitate decision-making in the workplace.
20. How does lean manufacturing address the issue of excess inventory?
- Lean manufacturing reduces excess inventory by implementing Just-in-Time production systems, minimizing batch sizes, and improving supply chain coordination to match production with customer demand.
21. What is the purpose of value-added analysis in lean manufacturing?
- Value-added analysis helps identify activities in a process that directly contribute to meeting customer requirements, enabling organizations to streamline operations and eliminate non-value-added activities.
22. How does lean manufacturing contribute to environmental sustainability?
- Lean manufacturing reduces waste generation, resource consumption, and energy usage, promoting environmental sustainability by minimizing the ecological footprint of production processes.
23. Explain the concept of Takt time in lean manufacturing.
- Takt time is the rate at which products must be produced to meet customer demand, ensuring a balanced and synchronized flow of work throughout the production process.

24. What role does leadership play in implementing lean manufacturing?
- Leadership is critical in driving cultural change, fostering employee engagement, and providing support and resources necessary for the successful implementation of lean manufacturing principles and practices.
25. How does Total Quality Management (TQM) complement lean manufacturing?
- Total Quality Management focuses on continuously improving product quality and customer satisfaction, aligning closely with lean manufacturing principles of waste reduction and process optimization.
26. What is the significance of Gemba in lean manufacturing?
- Gemba, which means "the real place" in Japanese, emphasizes the importance of observing processes firsthand and engaging with frontline employees to identify improvement opportunities and drive change.
27. How does lean manufacturing address the issue of variability in production processes?
- Lean manufacturing reduces variability by standardizing processes, implementing error-proofing techniques, and continuously monitoring and improving quality to ensure consistent and predictable outcomes.
28. What role do key performance indicators (KPIs) play in lean manufacturing?
- Key performance indicators help organizations measure progress, identify areas for improvement, and track the effectiveness of lean manufacturing initiatives in achieving strategic objectives.
29. How does lean manufacturing promote flexibility and responsiveness in production?
- Lean manufacturing promotes flexibility by enabling rapid changeovers, modular production systems, and cross-trained workforce, allowing organizations to adapt quickly to shifting customer demands and market conditions.
30. What is the role of value engineering in lean manufacturing?
- Value engineering focuses on maximizing the value of products or services by identifying and eliminating unnecessary costs while maintaining or enhancing functionality, aligning with lean manufacturing principles of waste reduction and efficiency improvement.
31. How does cellular manufacturing support lean principles?

- Cellular manufacturing organizes production processes into self-contained work cells, reducing material handling, setup times, and work-in-progress inventory, and improving flow and efficiency.
32. What are the characteristics of a lean culture?
- A lean culture is characterized by continuous improvement, respect for people, empowerment, teamwork, transparency, and a focus on delivering value to customers while eliminating waste.
33. How does Total Employee Involvement (TEI) contribute to lean manufacturing?
- Total Employee Involvement encourages active participation and engagement of all employees in problem-solving, decision-making, and improvement activities, harnessing the collective knowledge and expertise of the workforce to drive organizational success.
34. What role does supply chain management play in lean manufacturing?
- Supply chain management integrates suppliers, manufacturers, distributors, and customers to ensure seamless flow of materials, information, and resources, aligning with lean principles of value creation and waste elimination across the entire value stream.
35. How does mistake-proofing (Poka-Yoke) contribute to lean manufacturing?
- Mistake-proofing techniques prevent errors and defects from occurring or reaching the customer by designing processes, equipment, and systems that make it impossible or difficult to make mistakes, thereby improving quality and reducing waste.
36. What is the concept of continuous flow in lean manufacturing?
- Continuous flow involves producing goods or services in a smooth, uninterrupted manner, minimizing batch sizes, cycle times, and work-in-progress inventory, and optimizing process efficiency and responsiveness to customer demand.
37. How does Total Productive Maintenance (TPM) differ from traditional maintenance practices?
- Total Productive Maintenance focuses on proactive and preventive maintenance, involving all employees in equipment care and improvement activities to

maximize equipment effectiveness, minimize downtime, and enhance overall operational performance.

38. What is the role of benchmarking in lean manufacturing?

- Benchmarking involves comparing organizational performance metrics, processes, and practices against industry standards or best-in-class companies to identify areas for improvement and implement best practices, driving continuous learning and innovation.

39. How does lean manufacturing support the concept of "work as a system"?

- Lean manufacturing views work as a system interconnected by various processes, people, and resources, emphasizing the importance of optimizing the entire value stream to deliver value to customers while minimizing waste and inefficiencies.

40. What is the purpose of value stream management in lean manufacturing?

- Value stream management focuses on aligning business processes, resources, and capabilities to deliver value to customers, identifying and eliminating bottlenecks, inefficiencies, and non-value-added activities across the entire value stream.

41. How does lean manufacturing address the issue of uneven production flow?

- Lean manufacturing uses techniques such as Heijunka (production leveling), Kanban (visual signaling), and continuous improvement to smooth production flow, balance workloads, and synchronize processes, reducing lead times and variability.

42. What is the role of cross-functional teams in lean manufacturing?

- Cross-functional teams bring together individuals from different departments or disciplines to collaborate on problem-solving, process improvement, and innovation initiatives, leveraging diverse perspectives and expertise to drive organizational performance and success.

43. How does lean manufacturing promote a culture of problem-solving?

- Lean manufacturing encourages systematic problem-solving through techniques such as root cause analysis, A3 thinking, and Plan-Do-Check-Act (PDCA) cycles, empowering employees to identify, analyze, and address issues proactively to drive continuous improvement and innovation.

44. What role does management commitment play in lean transformation?

- Management commitment is essential for successful lean transformation, providing vision, direction, resources, and support to drive cultural change, empower employees, and sustain continuous improvement efforts across the organization.
45. How does lean manufacturing address the issue of variability in customer demand?
- Lean manufacturing uses techniques such as demand forecasting, flexible production systems, and agile supply chains to adapt quickly to fluctuations in customer demand, minimizing inventory, lead times, and waste while maximizing customer value and satisfaction.
46. What is the significance of Standard Work in lean manufacturing?
- Standard Work establishes the best-known method for performing a task or process, ensuring consistency, quality, and efficiency while providing a baseline for improvement and continuous learning.
47. How does Total Productive Maintenance (TPM) contribute to lean manufacturing principles?
- Total Productive Maintenance aims to maximize equipment availability, performance, and quality by involving all employees in equipment care, maintenance, and improvement activities, aligning with lean principles of waste reduction and continuous improvement.
48. What role does technology play in lean manufacturing?
- Technology enables lean manufacturing by providing tools, systems, and automation solutions to streamline processes, optimize workflows, and facilitate data-driven decision-making, enhancing efficiency, quality, and agility across the value stream.
49. How does lean manufacturing address the issue of overproduction?
- Lean manufacturing reduces overproduction by aligning production with customer demand, implementing Just-in-Time (JIT) systems, and optimizing production flow to minimize excess inventory, lead times, and waste.
50. What is the role of Total Quality Management (TQM) in lean manufacturing?
- Total Quality Management focuses on continuously improving product quality, customer satisfaction, and organizational performance through data-driven

decision-making, employee empowerment, and a culture of continuous improvement, complementing lean manufacturing principles of waste reduction and process optimization.

51. How does lean manufacturing promote workforce empowerment?

- Lean manufacturing empowers the workforce by involving employees in problem-solving, decision-making, and improvement activities, fostering a culture of accountability, ownership, and continuous learning to drive organizational performance and success.

52. What is the purpose of standardized work in lean manufacturing?

- Standardized work defines the most efficient methods for performing tasks, ensuring consistency, quality, and continuous improvement while providing a baseline for training, performance evaluation, and process optimization.

53. How does lean manufacturing promote supplier partnerships?

- Lean manufacturing fosters collaborative partnerships with suppliers through shared goals, mutual trust, and continuous improvement initiatives, enabling organizations to optimize supply chain efficiency, quality, and responsiveness while reducing costs and lead times.

54. What role does value analysis play in lean manufacturing?

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