

1. A team of engineers is working to improve a process to reduce the variation over time. What tool can be used to **measure the variation over time** to determine if specific changes have been effective in reducing variation?

- Histogram
- Scatter Plot
- **Control Chart**
- Pareto Chart

2. You've been tasked with improving a process, and you've identified that each individual who executes your process does it slightly different, and this person-to-person variation is resulting in poor yield downstream. You're in the process of **creating standard work** to reduce the person-to-person variation. Which phase of the DMAIC process are you in?

- Measure
- Analyze
- **Improve**
- Control

Creating **standard work** is an example of activity that would occur in the **IMPROVE** phase of the DMAIC Process.

3. A group of engineers have conducted a survey of customers and received a large quantity of feedback regarding their product. What quality tool will best help them **organize and analyze** this feedback?

- Matrix Diagram
- Tree Diagram
- Interrelationship Digraph
- **Affinity Diagram**

The **Affinity Diagram** is a tool that facilitates brainstorming and **organizes facts and data into themes or groups of common characteristics**.

4. Which lean tool is often first used in a lean transformation?

- Value Stream Mapping (VSM)
- Standard Work
- **5S**
- Kanban

5S is often the first tool used in a lean transformation as it organizes the work place, facilitates standard work, and makes waste visible for Kaizen. Many other tools are not possible for implementation if 5S is not in place.

5. A team of Reliability Engineers is testing a purchased component for its MTBF. The vendor indicates that the failure **distribution** is exponentially distributed. Which tool can be used to confirm this assumption?

- Pareto Chart
- Control Chart
- Scatter Plot
- **Histogram**

6. You're analyzing a complex process and want to communicate the **relationship between the multiple factors** associated with your process and your products functional requirements. Which tool is most appropriate to communicate this relationship?

- Fishbone Diagram
- **Matrix Diagram**
- Process Decision Program Chart
- Prioritization Matrix

The **Matrix Diagram** is a tool that is meant to explore, visualize and communicate the strength of relationships between different factors associated with a complex process, project or product.

7. Identify an activity below that is considered **preventative** in nature.

- Finished Goods Sampling Inspection – **Sampling inspection is an appraisal step and not preventative**
- Material Review Board – **This is meant to disposition of non-conforming material, thus it's corrective in nature**
- Pareto Analysis of In-Process Rejects – **Analysis of rejects is not preventative**
- **Supplier Evaluation & Selection**

8. You're working through the 8Ms of the cause-and-effect diagram and you're discussing how the **environment** might have caused or contributed to your problem, which category of the 8Ms are you in?

- Method
- Materials
- **Mother Nature**
- Machine

9. Lean manufacturing was matured and popularized by which company?

- GE
- Motorola
- Ford
- **Toyota**

10. You're implementing a corrective action that has been communicated to your regulatory agency with a due date that cannot be missed. What tool can be used to analyze your implementation strategy to minimize delays?

- **Process Decision Program Chart**
- Activity Network Diagram
- Pareto Chart
- Affinity Diagram

The **Process Decision Program Chart (PDPC)** is meant to facilitate a review of a project plan to **identify potential issues and develop contingencies and counter-measures** to ensure project success.

11. You're leading a team of engineers who have been tasked to increase the capacity of a process. You've measured the cycle time of each step in the process to **identify the bottleneck**. You've attempted to use kaizen activities to **increase the output of the bottleneck**, and now you're considering adding equipment to increase output. Which continuous improvement technique is being used?

- Kaizen Blitz
- **Theory of Constraints**
- PDCA
- Six Sigma

The **Theory of Constraints**, or **ToC**, is based on the assumption that every process has a **constraint (bottleneck)** that limits it from achieving its goal.

12. A manufacturer has just launched a brand-new product and complaints have been received for a short lifespan of the new product. A team of engineers have been assembled for root cause analysis. Which tool could be used to **identify potential root causes** that might be contributing to this problem?

- Check Sheet
- **Cause & Effect Diagram**
- Flow Chart
- Scatter Plot

13. You're working as part of a team, and you've brainstormed a ton of ideas surrounding a problem. Which tool could be used to analyze the **cause-and-effect relationships** between these ideas?

- Scatter Diagram
- Affinity Diagram
- **Interrelationship Diagram**
- Matrix Diagram

14. A paint company is designing a new formula for a new line of paint that has a 12-hour dry time. They designed this new brand of paint such that the 12-hour dry time **is not affected by differences in humidity, temperature or other environmental factors**. This new paint is an example of:

- Design for Six Sigma
- Design for Assembly
- **Robust Design**
- Poke-Yoke

Robust Design is the process of optimizing your design **to reduce the impact that uncontrollable variation has on the final product**. In this example, the company wanted to achieve a dry time that was unaffected by the environmental factors such as humidity and temperature.

15. You're working to implement a complex corrective action that will involve multiple interrelated activities across various departments, and you've been asked to create a project plan and **determine the critical path of the project**. Which tool is most appropriate to accomplish this task?

- Flow Chart
- Tree Diagram
- Interrelationship Digraph
- **Activity Network Diagram**

The **Activity Network Diagram** is a Project Planning and Management tool that defines **the sequential tasks** requires to complete a project, including an **analysis of the critical path** of a project.

16. A manufacturer wants to reduce in process scrap by nearly 30%. The team agrees the first step in the improvement process is to **collect data** to determine the categories of scrap occurring within the process. Which tool can be used to collect data?

- Pareto Chart
- Flow Chart
- Cause & Effect Diagram
- **Check Sheet**

Start Time: _____

Number Correct: _____

Stop Time: _____

Total Time: _____

Available Time: 30 Minutes

Target Time: 20 Minutes

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