QUESTIONS:

1. **Fill in the Blank: _____ is the natural variability associated with your stable process.**
   - Process Capability
   - Process Specification
   - Product Specification
   - Process Performance

2. **The Six Sigma Methodology was developed at:**
   - Motorola
   - Toyota
   - Ford
   - GE

3. **Fill in the Blank: _____ are the pre-defined specifications associated with the product that's produced by your process.**
   - Process Capability
   - Process Specifications
   - Process Inputs
   - Process Performance

4. **SIPOC stands for:**
   - Suppliers, Inputs, Process, Output, Customers
   - Service, Inventory, Process, Overview, Customers
   - Steering Committee, Internal Benchmarking, Project, Objectives, Closure
   - Study, Inputs, Process, Outputs, Control

5. **Your product is dimensioned and toleranced at 1.25 $\pm$ 0.10 in. You've performed a capability study and assessed your sample standard deviation to be 0.025 in. Calculate the Cp for your process.**
   - 1.0
   - 1.33
   - 1.66
   - 2.0

6. You are looking to make a major change to your product design, and you want to collect enough feedback from your customers to make a statistically significant conclusion, which customer data acquisition approach would be most useful?
   - Customer Interview
   - Focus Group
   - QFD
   - Customer Survey

7. Calculate C_p for the following parameters: (LSL = 3.35, USL = 3.85, σ = 0.05)
   - 2.0
   - 1.33
   - 1.66
   - 1.0

8. You're randomly selecting a single card from a standard deck of 52 cards. What is the probability of not selecting a King or a Diamond?
   - 16 in 52
   - 17 in 52
   - 35 in 52
   - 36 in 52

9. Calculate C_p for the following Parameters: (USL = 191, LSL = 143, σ = 12, μ = 175)
   - 0.67
   - 1.0
   - 1.33
   - 1.66

10. _____ is the degree of agreement between your measured values and the true value.
    - Precision
    - Linearity
    - Stability
    - Accuracy

SOLUTIONS:

1. **Fill in the Blank: _____ is the natural variability associated with your stable process.**
    - Process Capability
    - Process Specifications
    - Product Specification
    - **Process Performance**

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    - **Motorola**
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5. **Your product is dimensioned and toleranced at 1.25 ± 0.10 in. You've performed a capability study and assessed your sample standard deviation to be 0.025 in. Calculate the Cp for your process.**
    - 1.0
    - **1.33**
    - 1.66
    - 2.0

$$C_p = \frac{USL - LSL}{6\sigma} = \frac{1.35 - 1.15}{6 * 0.025} = \frac{0.20}{0.15} = \mathbf{1.33}$$

6. **You are looking to make a major change to your product design, and you want to collect enough feedback from your customers to make a statistically significant conclusion, which customer data acquisition approach would be most useful?**
    - Customer Interview
    - Focus Group
    - QFD
    - **Customer Survey**

7. **Calculate Cp for the following parameters: (LSL = 3.35, USL = 3.85, σ = 0.05)**
    - 2.0
    - 1.33
    - **1.66**
    - 1.0

$$C_p = \frac{USL - LSL}{6\sigma} = \frac{3.85 - 3.35}{6 * 0.05} = \frac{0.50}{0.30} = \mathbf{1.66}$$

8. **You're randomly selecting a single card from a standard deck of 52 cards. What is the probability of not selecting a King or a Diamond?**
    - 16 in 52
    - 17 in 52
    - 35 in 52
    - **36 in 52**

The probability of SELECTING a King or a Diamond is calculated as the following:

$$The\ Probability\ of\ A\ or\ B = P(A\ U\ B) = P(A) + P(B) - P(A \cap B)$$

$$The\ Probability\ of\ A\ or\ B = \left(\frac{4}{52}\right) + \left(\frac{13}{52}\right) - \left(\frac{1}{52}\right) = \frac{16}{52}$$

Now, the probability of NOT selecting a King or a Diamond, is the complement of that, which is calculated as such:

$$P(A°) = 1 - P(A\ or\ B) = 1 - \left(\frac{16}{52}\right) = \mathbf{\frac{36}{52}}$$

9. **Calculate Cp for the following parameters: (USL = 191, LSL = 143, σ = 12, μ = 175)**
   - **0.67**
   - 1.0
   - 1.33
   - 1.66

$$C_p = \frac{USL - LSL}{6\sigma} = \frac{191 - 143}{6 * 12} = \frac{48}{72} = \mathbf{0.67}$$

10. **_____ is the degree of agreement between your measured values and the true value.**
   - Precision
   - Linearity
   - Stability
   - **Accuracy**