1. **What defines the difference between the voice of the customer and the voice of the process in the context of calculating process capability?**
   - Voice of the customer represents customer expectations; voice of the process assesses the normal variation within the process
   - Voice of the customer involves statistical analysis; voice of the process involves qualitative data
   - Voice of the customer measures process stability; voice of the process measures process variability
   - Voice of the customer focuses on production standards; voice of the process focuses on quality control

2. **When performing a capability analysis, where does the VOC come from?**
   - The process performance
   - The process variation
   - The supplier
   - The customer

3. **When performing a capability analysis, where does the VOP come from?**
   - Special Cause Variation
   - Customer Specification
   - Unexpected Variation
   - Inherent Process Variation

4. **When performing process capability analysis, what sort of variation should be included in that calculation?**
   - Temporal Variation
   - Measurement System Variation
   - Special Cause Variation
   - Common cause variation

5. **When performing process capability analysis, the estimates of defects over time are based on which distribution?**
   - The chi-squared distribution
   - The student T Distribution
   - The F Distribution
   - The normal distribution

6. **What is the primary difference between the Cp calculation and the Pp calculation?**
   - Pp considers the center of your process, while Cp does not
   - Pp captures common cause variation only, and Cp includes all sources of variation
   - Cp calculations uses data from a control chart, Pp data does not
   - Cp data uses customer specifications, Pp uses process specifications

7. **You're looking at a data set and your Pp value is much lower than your Cp value, what is the correct conclusion?**
   - The Measurement system is incapable
   - Your specification limit is tight
   - The process is out of control
   - Your normal cause variation is high

8. **What is a prerequisite before calculating process capability?**
   - Process FMEA
   - Capacity Analysis
   - Normality of data
   - Calculating Takt Time

9. **Before calculating process capability, what is a crucial requirement to ensure?**
   - Consistency in product specifications
   - Consistency in sample size
   - Stability in process output over time
   - Availability of resources for analysis

10. **What analysis is essential before determining process capability?**
    - Gauge R&R
    - Process FMEA
    - ANOVA Analysis
    - Process Flow Mapping

SOLUTIONS:

1. **What defines the difference between the voice of the customer and the voice of the process in the context of calculating process capability?**
    *   **Voice of the customer represents customer expectations; voice of the process assesses the normal variation within the process**
    *   Voice of the customer involves statistical analysis; voice of the process involves qualitative data
    *   Voice of the customer measures process stability; voice of the process measures process variability
    *   Voice of the customer focuses on production standards; voice of the process focuses on quality control

Voice of the customer represents customer expectations; voice of the process assesses the natural variation within the process. The voice of the customer is based on customer requirements, whereas the voice of the process assesses how well the process meets those requirements.

2. **When performing a capability analysis, where does the VOC come from?**
    *   The process performance
    *   The process variation
    *   The supplier
    *   **The customer**

VOC stands for Voice of the Customer and it reflects the needs of the customer. The VOC must come directly from the customer.

3. **When performing a capability analysis, where does the VOP come from?**
    *   Special Cause Variation
    *   Customer Specification
    *   Unexpected Variation
    *   Inherent Process Variation

VOP stands for Voice of the Process and it reflects the random, normal, expected, inherent variation associated with the process being analyzed.

4. **When performing process capability analysis, what sort of variation should be included in that calculation?**
    *   Temporal Variation
    *   Measurement System Variation
    *   Special Cause Variation
    *   **Common cause variation**

The variation that should be used in the calculation of process capability should be the normal, expected, inherent variation within your process, which is also called common cause variation.

5. **When performing process capability analysis, the estimates of defects over time are based on which distribution?**
   - The chi-squared distribution
   - The student T Distribution
   - The F Distribution
   - **The normal distribution**

Process capability analysis, and the estimates for defects are all based on the normal distribution.

6. **What is the primary difference between the Cp calculation and the Pp calculation?**
   - Pp considers the center of your process, while Cp does not
   - Pp captures common cause variation only, and Cp includes all sources of variation
   - **Cp calculations uses data from a control chart, Pp data does not**
   - Cp data uses customer specifications, Pp uses process specifications

The only difference in the calculations for Cp and Pp is the way that we estimate the standard deviation. With the Cp calculation, that data must originate from a control chart, while the Pp data does not.

7. **You're looking at a data set and your Pp value is much lower than your Cp value, what is the correct conclusion?**
   - The Measurement system is incapable
   - Your specification limit is tight
   - **The process is out of control**
   - Your normal cause variation is high

When we compare Cp and Pp, if the Cp value is much larger than the Pp value, it implies that your process is being subjected to special cause variation and your process is out of control.

8. **What is a prerequisite before calculating process capability?**
   - Process FMEA
   - Capacity Analysis
   - **Normality of data**
   - Calculating Takt Time

Normality of data distribution. It is necessary for the underlying data to be normally distributed to accurately calculate process capability.

9. **Before calculating process capability, what is a crucial requirement to ensure?**
   - Consistency in product specifications
   - Consistency in sample size
   - **Stability in process output over time**
   - Availability of resources for analysis

Stability in process output over time means that your process is only experience normal, expected inherent variation. Process stability ensures consistent behavior, a fundamental prerequisite for calculating process capability.

10. **What analysis is essential before determining process capability?**
    - **Gauge R&R**
    - Process FMEA
    - ANOVA Analysis
    - Process Flow Mapping

Gauge Repeatability and Reproducibility study. Assessing the measurement system via Gauge R&R ensures the reliability of the measurement tools before calculating process capability.