

1. 1. Which of the following is NOT one of the seven quality management principles in ISO9000?

- A customer focus
- B process approach
- C evidence-based decision making
- D elimination of defects.

2. Which of the following statements about quality control (QC) and quality assurance (QA) is true?

- A Generally, the QA system in an engineering manufacturing company will include QC.
- B If a company has a QA system it doesn't need a QC system.
- C QA and QC are the same thing except the inspections and tests carried out under QA are more stringent than those carried out under QC.
- D If a company has both QA and QC systems no defects will ever arise in any of its products.

3. Which of the following is one of Professor Deming's 14 points for Total Quality Management (TQM)?

- A TQM is a management philosophy that should be applied by all employees in a company.
- B Quality is all about having the best design and using the best materials.
- C Employees work best when they are frightened of making mistakes.
- D Increase the level of inspections until all defects are eliminated.

4. In the context of sampling for QC purposes, which of the following is the best description of dispersion error?

- A Same confidence level but significantly different confidence interval.
- B Same confidence interval but significantly different confidence level.
- C Same mean as population but significantly different standard deviation.
- D Same standard deviation as population but significantly different mean.

5. A sample of 1000 products has a mean diameter of 100.00 mm and a standard deviation of 0.25 mm. How many products are acceptable if the minimum and maximum acceptable diameters are 99.50 mm and 100.50 respectively?

- A 925
- B 950
- C 995
- D 997

6. In a manufacturing company a very large number of products is to be sampled for QC purposes. The confidence level required is 95%, the standard deviation in the parameter being measured is 0.45 and the confidence interval is  $\pm 2\%$ . What would be an appropriate sample size?

- A 0.24
- B 24
- C 240
- D 2400

7. In a manufacturing company a very large number of products is to be sampled for QC purposes. A sample size of 500 was calculated to be appropriate. The standard deviation in the parameter being measured is 0.25 and the confidence interval is  $\pm 5\%$ . What is the required confidence level?

- A 90%
- B 95%
- C 99%
- D 99.5%

8. In sampling, what is meant by the term "confidence level"?

- A The margin of error between a sample measurement and the same measurement for the whole population
- B The spread of measurements around the mean
- C How certain we can be that a sample accurately reflects the whole population, within the margin of error
- D How sure we can be that if there are will be no defective products in a sample.

9. Which of the following is a non-statistical method of sampling?

- A simple random sampling
- B judgemental sampling
- C stratified sampling
- D cluster sampling.

10. Which of the following statements is NOT part of the Taguchi method:

- A Robust design to eliminate defects as much as possible before production
- B TQM
- C Statistical analysis of all types of losses
- D additional QC measures until 99.9% customer satisfaction is achieved.

**11. Six Sigma is a business philosophy that aims for perfection. One way to apply Six Sigma is the DMAIC approach. DMAIC stands for:**

- A Design-Manufacture-Assemble-Improve-Customer satisfaction
- B Design-Maximise-Attributes-Innovation-Control
- C Define-Measure-Analyse-Improve-Control.
- D Define-Measure-Analyse-Improve-Control.

**12. A company manufactures hand-held radio transceivers ("walkie-talkies"). There is a problem with excessive offset voltage in an amplifier circuit within the device which causes poor sound quality. Which of the following would be a robust design approach, as recommended by the Taguchi method?**

- A Change the specifications of the products to accommodate lower levels of sound quality.
- B Screen out circuits having large offset voltage at the end of the production line.
- C Institute tighter tolerances through process control on the manufacturing line.
- D Change the nominal values of critical circuit parameters so that the circuit's function becomes insensitive to variations in offset voltage.