About C.Q.E.
1. Introduction to CQE

Certified Quality Engineer (CQE)
Since 1968

The Certified Quality Engineer is a professional who understands the principles of product and service quality evaluation and control. This body of knowledge (BOK) and applied technologies include, but are not limited to, development and operation of quality control systems, application and analysis of testing and inspection procedures, the ability to use metrology and statistical methods to diagnose and correct improper quality control practices, an understanding of human factors and motivation, facility with quality cost concepts and techniques, and the knowledge and ability to develop and administer management information systems and to audit quality systems for deficiency identification and correction.
2. CQE Examination.

Examination.

Each certification candidate is required to pass a written examination that consists of multiple-choice questions that measure comprehension of the BOK. The Quality Engineer examination is a five-hour, 160 multiple-choice question examination. It is offered in the English language only.

Fees

<table>
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※ Regular Membership Affiliation Fee : $119
3. CQE Question Contents.

<table>
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<tr>
<th>Subject</th>
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<tr>
<td>I . Quality Management Techniques.</td>
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<td>II. Quality Systems.</td>
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<td>III. Quality Audits.</td>
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<tr>
<td>IV. Planning and Control Techniques.</td>
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<td>V. Sampling &amp; Measurements.</td>
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<td>VI. Reliability &amp; Risk Management.</td>
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<td>VII. Quality Improvement Techniques.</td>
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<td>VIII. Basic Statistical Concepts.</td>
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<td>IX. Statistical Applications.</td>
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<td>X. Advanced Statistical Methods.</td>
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<td><strong>Total</strong></td>
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4. CQE Eligibility.

- CQE participants must register with ASQ headquarters.

- CQE candidates must have a combination of eight years work experience and/or higher education in quality field.
  - Diploma from a technical or trade school—one year will be waived
  - Associate degree—two years waived
  - Bachelor's degree—four years waived
  - Master's or doctorate—five years waived

- Three years of this field must be in a decision making position.
5. CQE References.

· CQE Primer and Solution Text.

· Others.
  - Western Electric's Statistical Quality Control Handbook.
  - Juran & Gryna's Quality Planning and Analysis.
6. CQE Sample Test.

1. A company that supports the concept of an "internal supplier-customer relationship" should require:
   A. Measurement of how well the supplier meets customer expectations.
   B. Internal feedback from the customer to the supplier through the quality department.
   C. That each internal worker be responsible for satisfying the requirements of external customers.
   D. That each individual worker be a customer to the previous operation and a supplier to the next operation.

2. Which of the following tests may be used to determine whether a sample comes from a population with an exponential distribution?
   A. t    B. F    C. Chi-square    D. ANOVA
6. CQE Sample Test.

3. Which of the following tools are appropriate for a quality engineer to use in qualifying a process that has variable data?
   I. An $\bar{x}$ and R control chart
   II. A histogram
   III. c chart
   IV. p chart

A. I and II       B. II and III       C. III and IV       D. I, II, and IV

4. A quality engineer discovers that an alloy with a strength lower than specification was being used due to tremendous cost savings. There have been no instances of field failure. At this point, the quality engineer should
   A. Increase the number of field failure evaluations performed.
   B. Adjust the specifications based on the field performance history.
   C. Document the findings and take no further action.
   D. Report the discovery to appropriate supervision and request corrective action.
5. The correlation coefficient for the length and weight of units made by a process is determined to be 0.27. If the process were adjusted to reduce the weight of each unit by 0.5 ounce, the correlation coefficient of the length and weight of the units made by the new process would be equal to

A. 0.50  B. 0.27  C. 0.23  D. -0.23

6. A form, in either diagram or table format, that is prepared in advance for recording data is known as a

A. Cause-and-effect diagram.  B. Pareto chart.
C. Flowhart.  D. Check sheet.
6. CQE Sample Test.

7. A major drawback of using histograms in process control is that they
   A. Do not readily account for the factor of time.
   B. Are relatively difficult to construct and interpret.
   C. Require too many data points.
   D. Require too many intervals.

8. What is the required discrimination of a comparator given a tolerance of 0.005 and an accuracy ratio of 10:1 ?
   A. 0.0005          B. 0.005          C. 0.05          D. 0.5

9. Which of the following tools would be of the greatest use for finding the most efficient path and realistic schedule for the completion of a project ?
   A. Interrelationship diagram.       B. Activity network diagram.
   C. Tree diagram.                   D. Affinity diagram.
10. A control plan is designed to do which of the following?
   A. Supplement information contained in operator instructions.
   B. Support the production scheduling system.
   C. Provide a documented system for controlling processes.
   D. Provide a method for tracking the design review process.

11. A lot size of 450 pieces is being inspected for attributes, single sampling, normal inspection, general inspection II with an AQL of 1.0 using ANSI/ASQC Z1.4-1993 (MIL-STD-105E). On completion of the inspection, three non-conformances were found. Which of the following actions should be taken?
   A. Reject the lot.
   B. Accept the lot.
   C. Take a second sample.
   D. Reinspect the sample.
6. CQE Sample Test.

12. A manufacturer of air conditioners wants to estimate the mean life (years from installation to replacement) of its units. The error level is set at 0.5 year, a desired probability $(1 - \alpha)$ of 95% is selected, and the standard deviation of unit life is given as 6.0 years. If unit life is normally distributed, then the required sample size for the desired estimate is equal to
   A. 283                B. 291                C. 554                D. 585

13. The correct value for the expected frequency of cell I in the contingency table below is

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   A. 28                B. 42                C. 52                D. 78
14. Which of the following is an example of the hub system of document control?
   A. Area document control coordinators are responsible for issuing and controlling documents from departments in their area.
   B. A document control coordinator is responsible for establishing and implementing a company wide standard for document control.
   C. Satellite document stations are established throughout the facility.
   D. Each department is responsible for issuing and controlling its own documents.

15. Which of the following best describes a diagnosis?
   A. Any state of unfitness for use or nonconformance to industry-specific specification.
   B. An unproved assertion as to reasons for existence of defects and symptoms.
   C. A proven reason for the existence of the symptom as illustrated by previous occurrences.
   D. The process of studying symptoms, theorizing as to causes, testing theories, and discovering causes.
16. In terms of reliability engineering, the failure rate is the reciprocal of the
   A. Mean time to repair.                 B. Mean time between failures.

17. $\bar{X}$ and $\bar{R}$ have been computed for a series of control chart sample subgroups. Which of the following expressions would be used to calculate the spread of the individual units drawn from the production stream?
   A. $\bar{X} + A_3 \bar{s}$
   B. $\bar{X} + A_2 \bar{R}$
   C. $\bar{X} + 3\bar{R}/d_2$
   D. $\bar{X} + d_4 \bar{R}$

18. It is most appropriate to use a t-test for a hypothesis test to compare the
   A. Variances of two distributions.      B. Standard deviations of two distributions.
6. CQE Sample Test.

19. The formal, documented, comprehensive, and systematic examination of a design that ensures requirements are met, identifies problems, and proposes solutions is known as

A. Quality review. 
B. Design review. 
C. Design examination. 
D. Failure mode, effect, and criticality analysis.

20. Nonconformances were identified and segregated during a production shift. The manager of the next shift, on reviewing the nonconformances, determined that they were slight and requested that the material be released. What action should be taken next?

A. The material should be released.
B. All concerned groups should concur.
C. Engineering approval should be obtained.
D. Documented company procedures should be followed.
21. To determine the average number of nonconforming parts over time, which of the following attribute control charts would be most appropriate?
   A. c chart    B. npchart    C. p chart    D. u chart

Questions 22-23 refer to the following information.
Because of a problem with a critical component, a quality engineer is asked to audit the existing supplier. In preparing for the audit, the auditor asks for the supplier's quality manual. The manual indicates that the supplier has appropriate quality systems. During the course of the audit, records are found indicating that out-of-compliance products are released, and it appears that the quality manual does not represent the actual quality system in use.

22. This audit is an example of which type of quality cost?
23. If it is determined that the quality manual does not represent the quality system, the auditor should
   A. Ask to see additional records to verify findings.
   B. Contact purchasing to review the contract.
   C. Stop all further shipments.
   D. Request a meeting with the supplier's management.

24. Which of the following analyses is best used to study the potential failures in a system?
   A. Failure analysis.
   B. Fault tree analysis.
   C. Reliability allocation analysis.
   D. Pareto analysis.
6. CQE Sample Test.

25. Using fuses for overloaded circuits in a computer is an example of which of the following error-proofing principles?
## 6. CQE Sample Test.

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