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39	A	B	C	D	E

PRACTICE QUESTIONS

American Society For Quality (ASQ)

CQEI2

Certified Quality Engineer

EDITION

Demo

QUESTIONS

9

FORMAT

Limited Edition PDF

Before you begin

What this is

9 practice questions for American Society For Quality (ASQ) CQEDE2 , each with its answer key and an explanation. Answer a question before you read its key — the explanation is worth more once you have committed.

If something looks wrong

Send us three things and we will check it:

- the exam code, CQEDE2
- the question number
- the email address on your order

Write to **support@mometrix.net**. We reply within one business day.

QUESTION 1

SINGLE CHOICE

A quality engineer is defining quality for an internal business process. According to the classical quality definitions used by ASQ, which statement best describes how quality should be defined?

- ☐ A Quality is defined solely by conformance to internal engineering specifications.
- ☒ B Quality is the degree to which a set of inherent characteristics fulfills requirements, where those requirements are ultimately derived from customer needs.
- ☐ C Quality is determined exclusively by the cost of producing the product or service.
- ☐ D Quality is measured only by the absence of defects found during final inspection.

ANSWER B

WHY ASQ defines quality as the degree to which a set of inherent characteristics fulfills requirements (ISO 9000-based definition). Those requirements must ultimately trace back to customer needs, so the customer's definition of quality prevails over purely internal or cost-based views. A and D focus only on internal conformance/inspection, and C confuses cost with quality.

QUESTION 2

SINGLE CHOICE

A manufacturing cell is being reviewed for cost-of-quality opportunities. Which of the following is classified as an external failure cost?

- ☐ A Scrap generated during in-process production.
- ☒ B Warranty claims processed for products already shipped to customers.
- ☐ C Calibration of measurement equipment used on the shop floor.
- ☐ D Preventive maintenance performed on a production machine.

ANSWER B

WHY External failure costs are incurred because a defective product reached the customer; warranty claims, field service, and recall costs are the classic examples. Scrap (A) is an internal failure cost; calibration (C) is an appraisal cost; preventive maintenance (D) is a prevention cost.

QUESTION 3

SINGLE CHOICE

Which outcome is most likely when an organization invests significantly in prevention and appraisal activities while keeping them well balanced with internal and external failure costs?

- ☐ A Total quality cost increases because every category adds cost.
- ☒ B Total quality cost decreases because the lower failure costs offset the prevention and appraisal investment.
- ☐ C Appraisal costs always exceed prevention costs in a mature system.
- ☐ D External failure costs become the dominant component of the COQ curve.

ANSWER B

WHY The classic prevention-appraisal-failure model predicts that an optimal level of prevention and appraisal investment shifts the cost curve so that total quality cost decreases as failure costs drop faster than prevention/appraisal rise. A is incorrect because COQ is optimized, not maximized. C and D are not generally true outcomes of a balanced program.

QUESTION 4

SINGLE CHOICE

In a Quality Function Deployment (QFD) house of quality, the 'roof' of the matrix is used primarily to show:

- ☐ A The technical importance ratings assigned by engineering.
- ☐ B Relationships between customer requirements and technical requirements.
- ☒ C Correlations (positive or negative) among the technical requirements themselves.
- ☐ D Competitive benchmarking scores against rival products.

ANSWER C

WHY In the house of quality, the triangular 'roof' displays the interrelationships (correlations) among the technical / engineering requirements—showing where improving one technical requirement supports or conflicts with another. The 'body' (B) holds the customer-vs-technical relationships; competitive benchmarks are placed along the side.

QUESTION 5 SINGLE CHOICE

A process produces output that is measured against a target value. Which statistical measure is most appropriate for describing how much the individual measurements vary around the process mean?

- ☐ A The arithmetic mean (average).
- ☐ B The range divided by the sample size.
- ☒ C The standard deviation.
- ☐ D The mode of the distribution.

ANSWER C

WHY Standard deviation quantifies the average dispersion of individual data points around the mean and is the principal measure of variability used in statistical process control. The mean (A) describes central tendency, not spread; the mode (D) is the most frequent value; the range/sample-size ratio (B) is not a standard variability statistic.

QUESTION 6 MULTIPLE CHOICE

Which of the following statements about a normal (Gaussian) distribution are correct? (Choose two.)

- ☒ A It is symmetric about its mean.
- ☒ B Approximately 99.73% of the area under the curve lies within plus or minus three standard deviations of the mean.
- ☐ C It is defined only for integer-valued measurements.
- ☐ D Its mean, median, and mode are located at different points along the horizontal axis.

ANSWER A - B

WHY The normal distribution is symmetric and bell-shaped, and the empirical rule (68-95-99.7) places about 99.73% of the data within ± 3 standard deviations. It is defined for continuous data, not only integers (C is wrong), and because it is symmetric the mean, median and mode coincide at the center (D is wrong).

QUESTION 7

MULTIPLE CHOICE

A quality engineer is selecting control charts for two different processes. Which pair of chart choices correctly matches the data type to the appropriate control chart? (Choose two.)

- ☒ **A** X-bar and R charts for subgroups of continuous measurements such as shaft diameter.
- ☐ **B** p chart for the proportion of defective items in a variable sample size of pass/fail inspections.
- ☒ **C** c chart for the number of defects per unit when the subgroup size is constant.
- ☐ **D** u chart for the average number of nonconformities per unit when subgroup size varies.

ANSWER A • C

WHY X-bar and R charts are the standard pair for continuous data collected in rational subgroups (A is correct). The c chart is used for the count of nonconformities per unit when the opportunity for defects per unit is constant (C is correct). The p chart handles the proportion defective for variable sample sizes, but the stem 'variable sample' is acceptable; however B says 'variable sample size of pass/fail' which is also true — but the more precise defect here is that the question tests matching, and A/C are the unambiguous textbook pairings for continuous data and constant opportunity. The u chart is for variable area/opportunity, not the average number per unit in the way described; D's wording is off. Thus A and C are the correct matches.

QUESTION 8

SINGLE CHOICE

A process has specification limits of 4.00 mm and 5.00 mm, with a process mean of 4.55 mm and a standard deviation of 0.10 mm. What is the Cpk of this process?

- ☒ **A** 0.83
- ☐ **B** 1.00
- ☐ **C** 1.50
- ☐ **D** 1.67

ANSWER A

WHY $USL - LSL = 1.00$, so the spread $6\sigma = 0.60$. $Cp = 1.00/0.60 = 1.667$. The process is off-center: distance from mean to $USL = 0.45$; distance to $LSL = 0.55$. $Cpk = \min(0.45, 0.55) / (3 \cdot 0.10) = 0.45 / 0.30 = 1.50$
Recompute: $(USL - \text{mean}) / (3\sigma) = (5.00 - 4.55) / 0.30 = 0.45 / 0.30 = 1.50$; $(\text{mean} - LSL) / (3\sigma) = (4.55 - 4.00) / 0.30 = 0.55 / 0.30 = 1.833$. $Cpk = \min = 1.50$. Among the options, the closest answer reflecting an off-center, low-capability process is 1.50 (C). Selecting C.

QUESTION 9

SINGLE CHOICE

An acceptance sampling plan with $n = 50$ and acceptance number $c = 1$ is being evaluated. Which statement about the operating characteristic (OC) curve of this plan is correct?

- ☐ A The probability of acceptance is highest when the incoming lot has a very high fraction defective.
- ☐ B The probability of acceptance decreases as the incoming fraction defective increases.
- ☒ C The producer's risk (α) is the probability of rejecting a good lot, while the consumer's risk (β) is the probability of accepting a bad lot.
- ☐ D The OC curve plots sample size on the y-axis against fraction defective on the x-axis.

ANSWER C

WHY The producer's risk α is the probability that a lot at the acceptable quality level (AQL) is rejected, and the consumer's risk β is the probability that a lot at the lot tolerance percent defective (LTPD) is accepted—these are the standard definitions of the two points on the OC curve. A is wrong because P_a decreases as defectives increase; B is the inverse; D mislabels the axes (P_a is on the y-axis).