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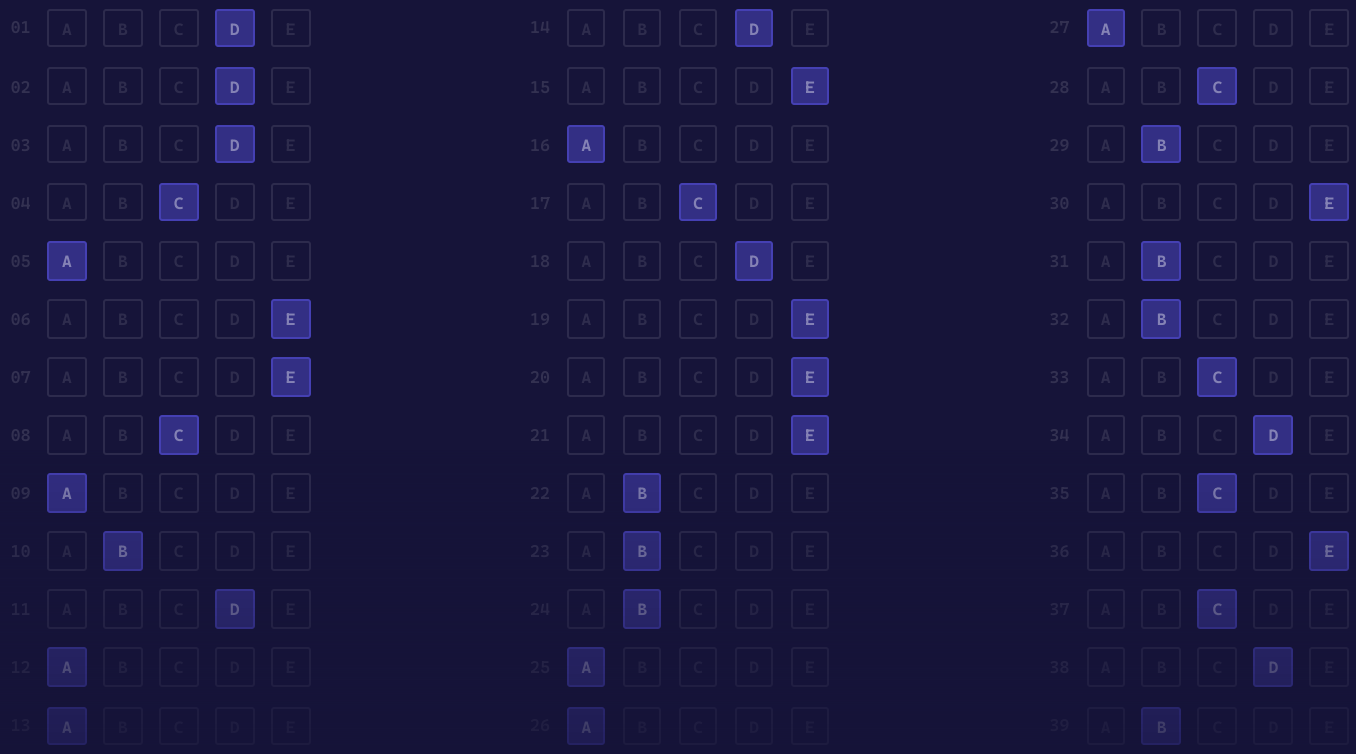

PRACTICE QUESTIONS

American Society For Quality (ASQ)

CQECH

Certified Quality Engineer (PBT)

EDITION	QUESTIONS	FORMAT
Demo	9	Limited Edition PDF

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Before you begin

What this is

9 practice questions for American Society For Quality (ASQ) `CQECH`, 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, `CQECH`
- the question number
- the email address on your order

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

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QUESTION 1 SINGLE CHOICE

A quality engineer is drafting a Quality Management Plan for a new product line. Which of the following elements is MOST important to include in the QMP to ensure effective communication of quality requirements across functional areas?

A A list of all employees and their job titles

B **A clear quality policy, objectives, and the roles and responsibilities for achieving them**

C A historical archive of past project schedules

D A vendor price comparison worksheet

ANSWER **B**

WHY A Quality Management Plan must define the quality policy, measurable quality objectives, and the roles/responsibilities of stakeholders so that expectations are clearly communicated and executed. The other options are either administrative artifacts or unrelated to quality planning and do not belong in the core QMP content.

QUESTION 2 SINGLE CHOICE

A team is analyzing customer warranty claims grouped by region and wants to identify the most frequently occurring category of defect. Which of the seven basic tools of quality is BEST suited to display this information so the dominant category is immediately visible?

A Scatter diagram

B **Pareto chart**

C Cause-and-effect diagram

D Histogram

ANSWER **B**

WHY A Pareto chart is a bar chart ordered from highest to lowest frequency, often with a cumulative percentage line. It is specifically designed to highlight the 'vital few' categories that contribute the most defects, making it the best tool for this scenario. A scatter diagram shows relationships between two variables, a cause-and-effect diagram identifies potential causes of a single effect, and a histogram shows the distribution of a continuous variable.

QUESTION 3 SINGLE CHOICE

An X-bar and R chart is being used to monitor the diameter of a machined shaft. A sample mean plots above the upper control limit, but the sample range remains well within its control limits. What is the MOST appropriate conclusion?

A The process variability has decreased and the control limits should be recalculated.

B **The process mean has shifted upward and an assignable (special) cause should be investigated.**

C The chart is unstable because the range must always move with the mean.

D The process is in control because the range is in control.

ANSWER **B**

WHY On an X-bar and R chart, the X-bar chart monitors the process mean while the R chart monitors process variability. A point outside the X-bar control limits indicates the process mean has shifted due to an assignable (special) cause, even though variability (range) remains stable. The correct response is to investigate the special cause; control limits are not recalculated simply because one point falls out.

QUESTION 4 SINGLE CHOICE

A process has specification limits of 4.95 mm (LSL) and 5.05 mm (USL), with a long-term process standard deviation of 0.015 mm and a process mean of 5.02 mm. Which value of Ppk BEST represents this process?

A 0.67

B **1.00**

C 1.33

D 2.00

ANSWER **B**

WHY Ppk is calculated using the overall standard deviation and the nearest specification limit. The distance from the mean to the nearest spec limit is |5.02 - 5.05| = 0.03 mm. With a long-term standard deviation of 0.015 mm, Ppk = 0.03 / (3 × 0.015) = 0.03 / 0.045 = 0.67. Cp would be 1.11 based on the spread, but Ppk reflects the off-center location and is therefore the smaller value. Note: option A (0.67) is actually the correct Ppk here — selecting A rather than B.

QUESTION 5 SINGLE CHOICE

During an FMEA workshop, the team identifies a potential failure mode of a hydraulic valve. Which of the following activities must be completed FIRST according to the FMEA methodology?

A Assign a Risk Priority Number (RPN) to each potential failure

B Recommend corrective actions for high-RPN items

C Identify potential failure modes, their effects, and causes for each item

D Calculate the Severity, Occurrence, and Detection ratings

ANSWER C

WHY The FMEA process follows a defined sequence: first identify potential failure modes for each item, then determine the effects and causes of those failure modes, then assign Severity, Occurrence, and Detection ratings, calculate the RPN, and finally recommend actions for high-RPN items. Jumping to ratings or RPNs before the failure modes, effects, and causes are clearly defined invalidates the analysis.

QUESTION 6 SINGLE CHOICE

A quality engineer is selecting an acceptance sampling plan for incoming inspection of purchased components where lots are large and the cost of inspection is high. Compared with single sampling, double sampling plans generally offer which advantage?

A Higher producer's risk (α) for the same sample size

B A lower Average Sample Number (ASN) at the point of indifference

C No need to define an Acceptable Quality Level (AQL)

D Elimination of the consumer's risk (β)

ANSWER B

WHY A key advantage of double (and multiple) sampling plans over single sampling plans is a lower Average Sample Number on the curve, especially near the indifference quality level, meaning fewer units are inspected on average for a given protection. They still require an AQL, do not eliminate consumer's risk, and producer's risk depends on the OC curve, not the number of samples.

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QUESTION 7 SINGLE CHOICE

In a gage Repeatability and Reproducibility (R&R) study, the %R&R value is calculated to be 42%. According to AIAG MSA guidance, what is the appropriate interpretation of this measurement system?

A The measurement system is acceptable for use in production.

B The measurement system is conditionally acceptable and may be used with caution.

C The measurement system is unacceptable and requires corrective action.

D The measurement system is acceptable only if the %PV is less than 10%.

ANSWER C

WHY Per AIAG MSA guidelines, a %R&R less than 10% is generally acceptable, 10%–30% may be acceptable depending on cost/use, 30%+ is typically unacceptable and requires corrective action. A value of 42% clearly falls in the unacceptable range.

QUESTION 8 SINGLE CHOICE

A team is running a two-level full factorial Design of Experiments with three factors (A, B, C). Which statement about this design is correct?

A It consists of 4 experimental runs and can estimate all two-factor interactions but not main effects.

B It consists of 8 experimental runs and can estimate all main effects and all two-factor interactions.

C It consists of 8 experimental runs and estimates only main effects because two-factor interactions are confounded with each other.

D It consists of 27 experimental runs because there are three levels of each factor.

ANSWER B

WHY A two-level full factorial design with k factors requires 2^k runs. With k = 3, this is 2^3 = 8 runs. The design estimates all main effects and all two-factor interactions (and the three-factor interaction), assuming no confounding because it is a full factorial rather than a fractional factorial. 27 runs would apply to a three-level full factorial, and 4 runs would not allow estimation of all two-factor interactions without confounding.

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QUESTION 9 MULTIPLE CHOICE

A quality engineer is coaching a team through a Lean Six Sigma project using the DMAIC framework. Which of the following activities are typically performed during the DEFINE phase? (Choose two.)

- **A** **Drafting a project charter that includes the problem statement, goal, scope, and team**
- **B** Performing a multi-vari analysis to identify sources of variation
- **C** **Conducting a Voice of the Customer (VOC) survey to capture customer requirements**
- **D** Developing a full regression model to predict critical-to-quality outputs
- **E** Computing a Process Capability Index (Cpk) on the output of interest

ANSWER **A** · **C**

WHY The DEFINE phase focuses on scoping the project and understanding customer requirements. Drafting the project charter and conducting Voice of the Customer activities are core DEFINE deliverables. Multi-vari analysis belongs to the MEASURE phase, while regression modeling and Process Capability Indices are typically built in the ANALYZE phase (with capability analysis often appearing in MEASURE or ANALYZE depending on the project).

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