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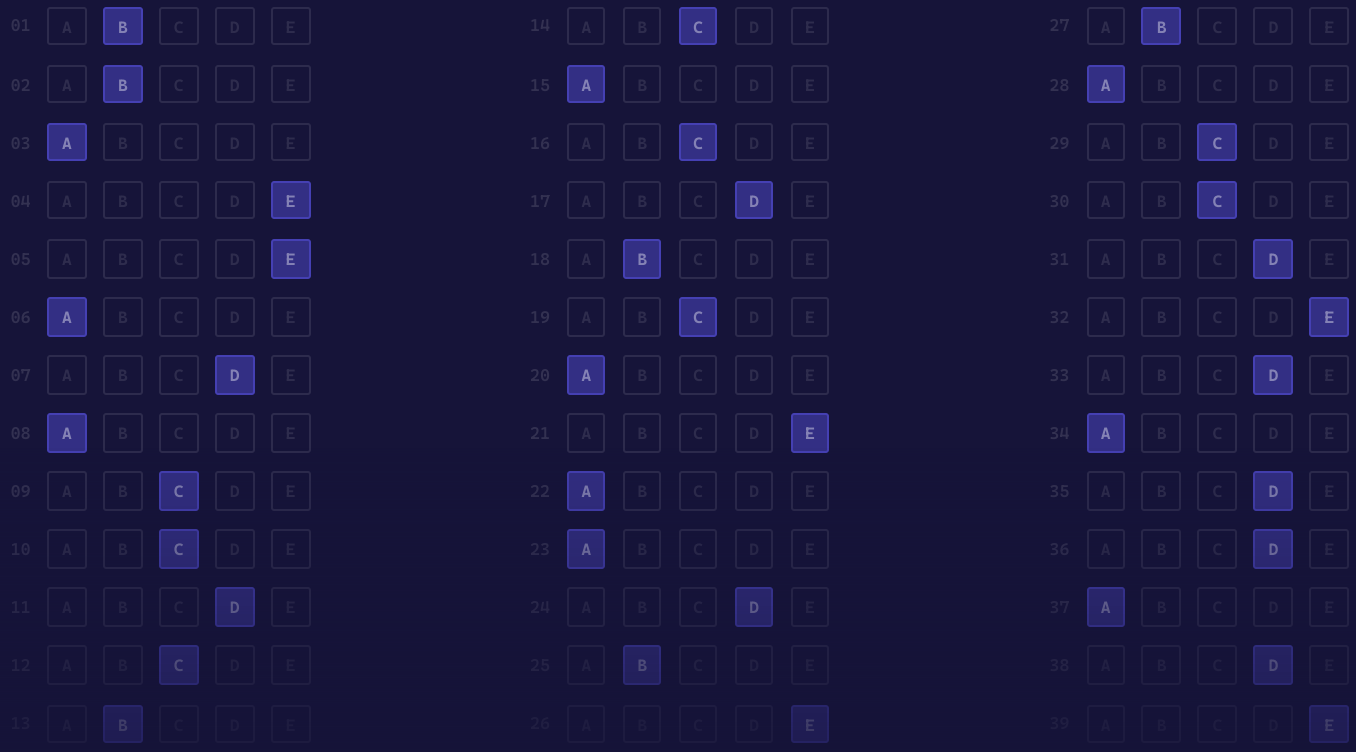


PRACTICE QUESTIONS

## American Society For Quality (ASQ)

# SBBEN2

Certified Six Sigma Black Belt

| 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) `SBBEN2`, 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, `SBBEN2`
- 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** MULTIPLE CHOICE

A Black Belt leading a DMAIC project at a financial services firm is evaluating a customer onboarding process. Which of the following activities are appropriate during the Define phase? (Choose two.)

A **Develop the project charter and obtain sponsor sign-off.**

B Perform a hypothesis test on the average account-opening time.

C **Identify the Voice of the Customer (VOC) for the onboarding process.**

D Calculate the process sigma level using a control chart.

E Validate the measurement system for cycle time data.

F Implement a pilot of the improved process.

**ANSWER** **A · C**

**WHY** The Define phase focuses on scoping the project, securing sponsorship, and identifying the customer's requirements. Developing the project charter with sponsor sign-off (A) and identifying the Voice of the Customer (C) are Define-phase activities. Hypothesis testing (B), calculating sigma levels (D), and measurement system validation (E) belong to Measure/Analyze, and piloting the improved process (F) is part of the Improve/Control phase.

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**QUESTION 2** MULTIPLE CHOICE

A Black Belt is comparing two processes using process capability indices. The specifications for a critical dimension are LSL = 8.00 mm and USL = 12.00 mm. Process A has a mean of 10.00 mm and standard deviation of 0.50 mm. Process B has a mean of 10.20 mm and standard deviation of 0.30 mm, using the same specifications. Which statements are correct? (Choose two.)

**A** **Process B has a higher Cp than Process A.**

B Process A is more centered than Process B.

**C** **Process B has a higher Cpk than Process A.**

D Process A has a higher Cpk than Process B.

E Both processes are equally centered on the target.

F Process A will produce fewer defects than Process B.

**ANSWER** **A · C**

**WHY** Cp = (USL−LSL)/(6σ). Process A: 4.00/(6×0.50) = 1.33. Process B: 4.00/(6×0.30) = 2.22, so Process B has a higher Cp (A). Cpk = min[(USL−x̄)/3σ, (x̄−LSL)/3σ]. Process A: min(2/1.5, 2/1.5) = 1.33. Process B: min(1.8/0.9, 2.2/0.9) = min(2.00, 2.44) = 2.00, so Process B has a higher Cpk (C). Although Process A's mean is closer to 10.00, both are nearly centered and Process A does not have a higher Cpk, nor will it produce fewer defects given Process B's tighter spread.

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**QUESTION 3** SINGLE CHOICE

During which DMAIC phase does a Black Belt primarily develop a data-collection plan and validate the measurement system?

A Define

**B Measure**

C Analyze

D Improve

E Control

**ANSWER B**

**WHY** The Measure phase focuses on establishing what to measure, developing data-collection plans, and validating measurement systems (for example, through Gage R&R studies). Define scopes the project, Analyze investigates root causes, Improve implements solutions, and Control sustains gains.

**QUESTION 4** SINGLE CHOICE

A process produces parts with individual cycle times that are highly skewed. The Black Belt collects samples of size n = 35 from this process and plots the distribution of the sample means. According to the Central Limit Theorem, what is true about this distribution of sample means?

A It will have the same shape as the distribution of individual cycle times.

**B It will be approximately normally distributed regardless of the shape of the underlying distribution.**

C It will be skewed in the opposite direction of the original distribution.

D It will be uniformly distributed between the minimum and maximum individual values.

E It will only be normally distributed if the original process is stable.

**ANSWER B**

**WHY** The Central Limit Theorem states that the sampling distribution of the sample mean approaches a normal distribution as the sample size becomes large, regardless of the population's distribution shape. With n = 35, the sample means will be approximately normal even though the individual cycle times are skewed.

**QUESTION 5** SINGLE CHOICE

A Black Belt is leading a project to redesign a customer-facing online application. The team uses a tool to translate customer requirements (the 'Whats') into specific technical characteristics (the 'Hows'). Which quality tool is being applied?

A Failure Mode and Effects Analysis (FMEA)

**B Quality Function Deployment (QFD) / House of Quality**

C Pareto analysis

D SIPOC diagram

E Cause-and-effect diagram

**ANSWER B**

**WHY** Quality Function Deployment (QFD), commonly visualized through the House of Quality, is used to translate the Voice of the Customer (Whats) into actionable technical/process requirements (Hows). FMEA evaluates potential failures, a Pareto chart prioritizes issues, a SIPOC provides a high-level process view, and a fishbone diagram identifies potential causes of an effect.

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**QUESTION 6** SINGLE CHOICE

A Black Belt is testing whether a new manufacturing process has reduced the mean defect rate below the historical 5%. The null hypothesis is H0: $\mu = 5\%$ and the alternative hypothesis is H1: $\mu < 5\%$. If the team concludes the new process is better when in reality it is not, which type of error has occurred?

**A** **Type I error**

B Type II error

C Random sampling error

D Alpha (α) inflation error

E Statistical power error

**ANSWER** **A**

**WHY** A Type I error occurs when the null hypothesis is rejected when it is actually true (a false positive). Here, rejecting H0 and concluding the process has improved when the mean is still 5% is a Type I error, with probability equal to α.

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**QUESTION 7** SINGLE CHOICE

A Black Belt needs to compare the cycle times of two independent groups of transactions to determine whether their population means differ. The data in both groups are approximately normally distributed and the variances are equal. Which hypothesis test is most appropriate?

A Paired t-test

**B Two-sample t-test (pooled)**

C One-sample t-test

D Chi-square test of independence

E Mann-Whitney U test

**ANSWER B**

**WHY** For two independent samples with approximately normal distributions and equal variances, the pooled two-sample t-test is appropriate. A paired t-test requires paired observations, a one-sample t-test compares a single group to a target value, the chi-square test handles categorical data, and Mann-Whitney is a non-parametric alternative used when normality cannot be assumed.

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**QUESTION 8** SINGLE CHOICE

A company is launching an entirely new service that does not exist in its current process portfolio. The Black Belt proposes following a design roadmap consisting of Identify, Design, Optimize, and Validate. Which DFSS roadmap is being referenced?

A DMAIC

B DMADV

**C IDOV**

D PDCA

E SIPOC

**ANSWER C**

**WHY** The IDOV (Identify, Design, Optimize, Validate) roadmap is a DFSS framework commonly associated with design for Six Sigma. DMAIC is for improving existing processes, DMADV focuses on Define/Measure/Analyze/Design/Verify, and PDCA is the Deming cycle. SIPOC is a scoping tool, not a roadmap.

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**QUESTION 9** SINGLE CHOICE

A Black Belt is conducting a value-stream walk on a hospital admissions process. The team is identifying activities that consume resources but do not create value from the patient's perspective, such as duplicate form entry and waiting for bed assignment. Which lean term best describes these activities?

A Value-added steps

**B Non-value-added steps (waste / muda)**

C Bottleneck capacity

D Takt time

E Poka-yoke controls

**ANSWER B**

**WHY** In lean terminology, activities that consume resources without creating value for the customer are classified as non-value-added steps (muda, or waste). Examples include waiting, transportation, over-processing, and duplicate data entry. Reducing muda is a core objective of value-stream mapping.

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