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Six Sigma Green Belt

ASQ CSSGB

Version Demo

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Topic Break Down

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QUESTION NO: 1

A Belt concludes a Lean Six Sigma project with the creation of a Control Plan. At what point can the Control Plan be closed?

A. Never, a Control Plan is a living document

B. As soon as the Champion signs off

C. Within 30 days of the LSS project review team meeting

D. After the project has been presented at the recognition event

ANSWER: A

Explanation:

Never, a Control Plan is a living document is correct because the Control Plan is the mechanism used to sustain the improved process after the Lean Six Sigma project work is complete. It documents the critical process and output measures to monitor, the target or specification, the measurement method and frequency, the accountable process owner, and the response or reaction plan if performance departs from the intended condition. These controls remain necessary during normal operations; therefore, project approval, a review meeting, or a recognition event does not end the need for the plan.

In the Control phase, responsibility transitions from the Belt and project team to the process owner, who uses and revises the Control Plan as process conditions, customer requirements, risks, measurement systems, or operating methods change. The document may be superseded by a revised plan when the process is formally changed, but it should not simply be closed as a completed project artifact. This continuing-control focus aligns with ASQ's Six Sigma Green Belt scope, which includes control plans and maintaining gains after improvement. See ASQ's Certified Six Sigma Green Belt certification information and the ASQ control plan resource.

QUESTION NO: 2

A process can be defined as a repetitive and systematic series of steps or activities where inputs are modified or assembled to achieve a customer desired result.

A. True

B. False

ANSWER: A

Explanation:

"True" is correct. In Six Sigma and quality-management practice, a process is understood as a defined, repeatable set of interrelated activities that transforms inputs into outputs. Those outputs are intended to meet a requirement or create value for a customer, whether that customer is external or an internal downstream user. The statement accurately captures the essential process model: work follows a systematic sequence; materials, information, labor, equipment, or other inputs are changed, combined, or otherwise acted on; and the resulting output is evaluated in terms of customer needs. This definition is fundamental to process thinking in the ASQ Six Sigma Green Belt Body of Knowledge, because improvement teams must first identify process boundaries, suppliers, inputs, activities, outputs, and customers before measuring performance and reducing variation. A process need not be manufacturing-specific: service, transactional, administrative, and healthcare workflows also transform inputs into customer-valued results. ISO's quality-management principles similarly emphasize understanding and managing interrelated activities as processes to achieve intended results. See ASQ's Six Sigma Green Belt resources and the ISO 9001 quality-management overview.

QUESTION NO: 3

The essence of Lean is to concentrate effort on removing waste while improving process flow to achieve speed and agility at lower cost.

A. True

B. False

ANSWER: A

Explanation:

True is correct. Lean is a customer-value-focused management philosophy that seeks to deliver products or services with less time, effort, inventory, space, and cost by systematically identifying and eliminating non-value-added activity, commonly called waste. Removing waste is not an isolated cost-cutting exercise: it enables work to move continuously and reliably through the process. Better flow reduces waiting, handoffs, queues, excess work in process, and delays, which in turn shortens lead time and improves responsiveness to changing customer demand. These outcomes support the speed and agility described in the statement while also lowering the resources required to produce value. Lean methods therefore focus on understanding the value stream, making process work visible, improving flow, and pursuing continuous improvement. This description is consistent with ASQ's overview of Lean as a methodology for maximizing customer value while minimizing waste, and with the Lean Enterprise Institute's explanation that Lean creates more value using fewer resources. See ASQ: Lean and Lean Enterprise Institute: What Is Lean?.

QUESTION NO: 4

The reason(s) for not marking the customer Specification Limits (SL) on a Control Chart is which of these? (Note: There are 4 correct answers).

A. Process control teams should not control a process based on SLs

B. Displaying the SLs on a Control Chart sends a wrong signal toward process control

C. Marking the SLs on a Control Chart is against the principle of charting

D. By marking the SLs, one can confuse the operator as to what limits are critical

E. By using mere Control Limits the process only needs to be in Statistical Control

ANSWER: A B D E

Explanation:

“Process control teams should not control a process based on SLs” is correct because specification limits define customer requirements for individual units, whereas a control chart is used to understand and manage process behavior over time. “Displaying the SLs on a Control Chart sends a wrong signal toward process control” is also correct: it can encourage reacting to whether observations are near a requirement boundary rather than responding to statistically meaningful signals of special-cause variation.

“By marking the SLs, one can confuse the operator as to what limits are critical” is correct because control limits and specification limits have different sources and purposes. Control limits are calculated from process data; specification limits are established by customer, design, or engineering requirements. Keeping them visually distinct helps operators use the chart correctly for timely process-control decisions. “By using mere Control Limits the process only needs to be in Statistical Control” correctly reflects the chart's primary purpose: establishing whether the process is stable and predictable. After stability is demonstrated, capability analysis can compare the stable process distribution with customer specification limits. ASQ describes control charts as tools for monitoring variation and distinguishing common from special causes, while NIST explains the separate roles of control limits and specification limits. See ASQ's Control Chart resource and the NIST Statistical Process Control handbook.

QUESTION NO: 5

SPC charts typically have the most recent data point on the right hand side.

A. True

B. False

ANSWER: A

Explanation:

True is correct. Statistical process control (SPC) charts are time-ordered displays of process data. Their horizontal axis normally represents the sequence in which observations were collected, such as sample number, date, shift, or time period. As new measurements are obtained, they are appended after the earlier observations; consequently, the latest data point is ordinarily displayed at the far right of the chart. This left-to-right chronology enables the team to see the current process state quickly and to recognize meaningful patterns over time, including shifts, trends, cycles, or points that signal special-cause variation. Control limits and a center line provide the reference needed to interpret those chronologically plotted observations and decide whether investigation or action is warranted. This convention is central to the practical use of an SPC chart as an ongoing monitoring tool rather than merely a summary of historical data. ASQ describes control charts as graphs used to study how a process changes over time, and NIST similarly describes plotting data in time order to assess process stability. See ASQ’s Control Chart resource and the NIST/SEMATECH control-chart guidance.

QUESTION NO: 6

Which of these are examples of non-value-added activities from the customer's perspective? (Note: There are 3 correct answers).

A. Waiting for an approval

B. Reworking an incorrectly completed order

C. Transporting material between distant work areas

D. Machining a part to the required dimension

E. Providing the requested service to the customer

ANSWER: A B C

Explanation:

Non-value-added activities consume time, effort, or resources without transforming the product or service in a way for which the customer is willing to pay. Waiting for approval, reworking an error, and moving material unnecessarily are common forms of Lean waste. These activities may be required by the current process, but they do not add customer value and should be reduced or eliminated when feasible.

Activities that directly transform a product or service to meet a customer requirement can be value-added. A Green Belt should distinguish customer value from activities that are merely necessary because of current systems, policies, or process weaknesses. See ASQ's Lean resources.

QUESTION NO: 7

For the data shown here a Belt suspects the three grades are supplying the same results. Which statement(s) are true for proper Hypothesis Testing?

A. The most appropriate Central Tendency to test is the Means

B. An appropriate test to test Central Tendency is the Levene’s test

C. An appropriate test to test Central Tendency is the ANOVA test

D. An appropriate test to test Central Tendency is the Mood’s Median test

ANSWER: D

Explanation:

“An appropriate test to test Central Tendency is the Mood’s Median test” is correct because the question concerns whether three independent grade groups have the same central location, and Mood’s median test is a nonparametric procedure for testing equality of population medians across two or more groups. The test pools the observations, determines the overall median, and assesses whether the groups differ significantly in the proportions of observations above and below that median. This makes it suitable when median, rather than mean, is the relevant measure of central tendency and when the assumptions needed for a mean-based parametric comparison are not established or are not appropriate for the displayed data.

For a Six Sigma Belt, the key hypothesis is that the grade populations have a common median; the alternative is that at least one grade’s median differs. The method therefore directly addresses the stated question about whether the three grades are supplying equivalent typical results, while avoiding a requirement to model the data as normally distributed continuous measurements. NIST describes Mood’s median test as a rank-based/nonparametric approach for comparing central location among groups. See the NIST reference for the median test and the NIST discussion of nonparametric comparisons.

QUESTION NO: 8

Non-parametric testing is done when which of these are applicable? (Note: There are 3 correct answers).

A. When the traditional t tests don’t produce the results we need

B. A Hypothesis Test for the Median of the population is in question

C. It does not require data to come from Normally Distributed populations

D. They look at the Median rather than the Mean of populations

E. When there are no parameters to measure in the process

ANSWER: B C D

Explanation:

Nonparametric methods are appropriate when the question concerns a population median, especially when the available data are ordinal, are naturally handled as signs or ranks, or do not support reliable assumptions about a population’s distribution. The sign test, for example, is expressly a nonparametric procedure for testing a population median; it uses whether observations fall above or below a hypothesized median rather than relying on normal-distribution calculations. Many other nonparametric procedures likewise use ranks, which makes them useful when numerical spacing is uncertain or when distributional shape cannot be assumed.

It does not require data to come from Normally Distributed populations is correct because nonparametric procedures do not require the normality assumption that underlies common parametric mean-based procedures. They look at the Median rather than the Mean of populations is correct in the intended context of median-focused nonparametric testing: the location being assessed is the median rather than an arithmetic mean. In Six Sigma practice, this makes nonparametric testing a valuable choice for skewed process data, ordinal ratings, and situations in which robust rank- or sign-based inference is more appropriate than inference based on means. ASQ’s Six Sigma Green Belt body of knowledge includes selecting and applying appropriate hypothesis tests and recognizing their assumptions. See ASQ Certified Six Sigma Green Belt and the NIST overview of nonparametric techniques.

QUESTION NO: 9

Examples of a Visual Factory include which of these? (Note: There are 2 correct answers).

A. White outlines on floor for proper inventory placement

B. Documented procedures with a numerical outline

C. Bad/Good indications of gauge readings with red and green outlines

D. Implementing a defect inspection device

ANSWER: A C

Explanation:

A visual factory makes workplace conditions, standards, flow, and abnormalities understandable at a glance, so employees can act quickly without searching through detailed documentation or relying on verbal interpretation. “White outlines on floor for proper inventory placement” is a direct visual-management control: marked locations establish the expected condition for materials and make missing, misplaced, or excess inventory immediately apparent. This supports orderly flow, workplace organization, and sustained standard work.

“Bad/Good indications of gauge readings with red and green outlines” is also a visual-factory practice because it translates measurement status into an immediate, easily interpreted signal. Clear visual limits help an operator recognize whether a process or product characteristic is acceptable and respond promptly when a reading indicates an abnormal condition. Visual controls such as color coding, floor markings, labels, status indicators, and posted standards are commonly used in Lean and Six Sigma environments to expose conditions and enable rapid decisions at the point of work. ASQ describes visual management as communicating information through visual signals to make work status and standards apparent; see ASQ’s visual management resource. Additional practical context is available from the Lean Enterprise Institute’s overview of Lean.

QUESTION NO: 10

Which of these statements describe an undesirable situation when implementing SPC? (Note: There are 2 correct answers).

A. The lower Control Limit for the R chart is equal to zero

B. The Control Limits are wider than the customer specification limits

C. A process is in Statistical Control before implementation of SPC

D. Attempt to use SPC for tracking transaction times at a warehouse

E. Indication of the specification limits on the Control Chart

ANSWER: B E

Explanation:

“The Control Limits are wider than the customer specification limits” describes an undesirable condition because control limits reflect the process’s actual, expected common-cause variation. When that natural process spread is wider than the customer’s allowable tolerance range, the process is not capable of consistently meeting requirements, even if it is statistically stable. SPC should therefore be used to reduce and control variation, while capability analysis evaluates whether that controlled variation fits within specification limits.

“Indication of the specification limits on the Control Chart

” is undesirable as an SPC implementation practice because specification limits and control limits serve fundamentally different purposes. Control limits are calculated from process data and are used to distinguish common-cause from special-cause variation. Specification limits are externally established customer or design requirements used to judge conformance. Combining their visual interpretation on the same control chart can encourage users to treat specifications as process-control signals, obscuring the chart’s primary purpose: determining whether the process is statistically stable and signaling when investigation is warranted. ASQ distinguishes control charts as tools for monitoring process variation and stability, while specifications are requirements used in capability assessment. See ASQ’s Control Chart resource and Statistical Process Control resource.

QUESTION NO: 11

A Stable process is a process whose output is consistent over time. A primary tool used to analyze Stability would be a ________________.

A. Data Forward Plot

B. Bag Plot

C. Min/Max Plot

D. Time Series Plot

ANSWER: D

Explanation:

A time series plot is the appropriate primary tool because process stability concerns whether performance remains predictable over time. This graph displays measurements in their chronological sequence, allowing the Green Belt to examine the process for time-related patterns such as shifts in the average, gradual trends, cycles, or unusual individual observations. A stable process exhibits only its routine, inherent variation over time; when the plotted data show a nonrandom pattern or a meaningful change in level or spread, the team should investigate potential special causes before drawing conclusions about process capability or making improvement decisions.

In Six Sigma practice, a time series plot is commonly an early graphical diagnostic during the Measure and Analyze phases. It preserves the time order that can be lost in summary statistics and distribution plots, making it especially useful for determining whether collected data represent a consistent process. Control charts build on this same time-ordered principle by adding statistically derived limits for ongoing stability monitoring. ASQ's quality resources describe control charts as tools for studying variation over time and identifying whether a process is in statistical control; a time series plot provides the foundational visualization for that assessment. See ASQ: Control Chart and NIST: Time Series Plot.

QUESTION NO: 12

Which of these actions support the Lean principle of reducing setup time? (Note: There are 3 correct answers).

A. Prepare required tools before the equipment is stopped

B. Convert internal setup activities to external activities

C. Use quick-release or standardized fasteners

D. Increase batch size to avoid performing changeovers

E. Add a separate final inspection after every setup

ANSWER: A B C

Explanation:

Preparing tools and materials before equipment is stopped, converting internal setup activities to external activities where possible, and using quick-release or standardized fasteners are all actions that reduce setup time. These practices are central to single-minute exchange of die (SMED) thinking, which seeks to reduce the time required to change over from one product or condition to another.

Shorter setups improve flexibility, support smaller batch sizes, reduce waiting, and can lower work-in-process inventory. Adding inspection after every setup may detect defects, but it does not directly reduce setup time. See ASQ's Lean resources and the Lean Enterprise Institute's SMED overview.

QUESTION NO: 13

When analyzing a data set we frequently graph one metric as a function of another. If the slope of the Correlation line is -2.5 we would say the two metrics are ___________ correlated?

A. Positively

B. Not

C. Negatively

D. None

ANSWER: C

Explanation:

Negatively is correct because a fitted line with a slope of −2.5 falls as the horizontal-axis metric increases. In practical terms, each one-unit increase in the predictor is associated with an estimated 2.5-unit decrease in the response metric. This downward direction is the defining visual and mathematical feature of a negative linear association: observations tend to move in opposite directions, with larger values of one metric generally occurring alongside smaller values of the other.

The numerical value −2.5 is a regression slope, so it describes the expected change in the response per one-unit change in the predictor and depends on the variables' measurement units. Correlation is conventionally summarized by the correlation coefficient, whose value is restricted to the range from −1 to +1. Nevertheless, its sign matches the direction indicated by a least-squares regression slope: a negative slope corresponds to a negative correlation, assuming the variables have nonzero variation. In Six Sigma analysis, this direction helps teams understand whether a potential input and output tend to vary oppositely before investigating the process mechanism and confirming any causal relationship. See the NIST regression reference and the NIST correlation reference.

QUESTION NO: 14

Which statement(s) are true about the Fitted Line Plot shown here? (Note: There are 2 correct answers).

A. When Reactant increases, the Energy Consumed increases.

B. The slope of the equation is a positive 130.5.

C. The predicted output Y is close to -18 when the Reactant level is set to 6.

D. Over 85 % of the variation of the Energy Consumed is explained by the Reactant via this Linear Regression.

ANSWER: C D

Explanation:

The correct interpretations are that the predicted output Y is close to -18 when the Reactant level is set to 6, and that over 85% of the variation in Energy Consumed is explained by Reactant through the linear regression model. A fitted-line plot displays the estimated regression equation, allowing a predicted response to be calculated by substituting a chosen Reactant value into that equation. At a Reactant setting of 6, the fitted line gives a response near -18; this is the model's predicted mean response at that input level, rather than necessarily an individual observed result.

The percentage of response variation explained by the fitted predictor is represented by the coefficient of determination, R-squared. An R-squared value above 85% means that Reactant accounts for more than 85% of the observed variation in Energy Consumed under this linear model. This indicates a strong model fit in the descriptive sense: the fitted line captures a substantial proportion of the response's variability. In Six Sigma analysis, regression and R-squared are used to quantify how well an identified input relates to a process output and to support data-based process understanding. See ASQ's overview of regression analysis and NIST's guidance on linear least-squares regression.

QUESTION NO: 15

The practice of utilizing Poka-Yoke is also known as ________________.

A. Thorough integration

B. Mistake proofing

C. On site inspection

D. Lean controls

ANSWER: B

Explanation:

Poka-Yoke is correctly known as **mistake proofing** (also commonly written as “mistake-proofing” or described as error proofing). Originating from the Toyota Production System and associated with Shigeo Shingo, poka-yoke means designing a process, product, fixture, or work method so that an error is prevented from occurring or is detected immediately, before it can become a defect that moves downstream. In Six Sigma and Lean practice, mistake proofing is a practical control method because it reduces reliance on memory, attention, inspection, or operator judgment. Examples include a connector that can fit only in the correct orientation, a required-field validation that prevents form submission, or a fixture that will not permit a part to be assembled incorrectly. Effective poka-yoke solutions are built into the work itself and provide simple, reliable feedback or prevention at the point where the potential error occurs. This supports defect prevention, process consistency, and sustained improvement—key Green Belt objectives. ASQ identifies poka-yoke as a Japanese term for mistake proofing, and its quality glossary discusses it as an error-prevention approach. See ASQ’s mistake-proofing resource and ASQ’s Lean resources.

QUESTION NO: 16

Which elements are normally included in a SIPOC diagram? (Note: There are 5 correct answers).

A. Suppliers

B. Inputs

C. Process

D. Outputs

E. Customers

F. Control Limits

ANSWER: A B C D E

Explanation:

A SIPOC diagram provides a high-level representation of a process and is named for its five standard elements: Suppliers, Inputs, Process, Outputs, and Customers. It is commonly developed early in a DMAIC project to establish process boundaries, clarify the major transformation steps, and identify the internal or external customers who receive the process outputs.

A SIPOC does not normally document detailed work instructions, statistical control limits, or root causes. Those items can be developed later as the project progresses through Measure and Analyze. See ASQ's SIPOC resource.