

# Certified Six Sigma Green Belt

STUDY GUIDE | EXAM 6

100 multiple-choice practice questions

Answer key and concise rationales included

Practice material for study use. It is not affiliated with or endorsed by any certification body.

# Instructions

Select the best answer. Complete the questions before reviewing the answer key. This practice exam covers project definition, measurement, analysis, improvement, control, Lean, and core statistical tools.

**1. A project team is selecting projects. Which criterion best demonstrates strategic alignment?**

- A. Direct support of a stated business objective
- B. Largest team available
- C. Most complex data set
- D. Shortest charter

**2. Which is a measurable CTQ for call-center responsiveness?**

- A. Friendly service
- B. Good teamwork
- C. Percent of calls answered within 30 seconds
- D. Modern software

**3. A process boundary should identify:**

- A. Where the process starts and stops
- B. Only its annual cost
- C. Every potential solution
- D. Only the sponsor name

**4. Attribute data are:**

- A. Measurements on a continuous scale
- B. Always normally distributed
- C. Counts or classifications
- D. Only financial data

**5. Why use a median when data are highly skewed?**

- A. It is less influenced by extreme values
- B. It always has a smaller standard deviation
- C. It replaces the need for a histogram
- D. It proves normality

**6. A data point beyond a control limit should first be treated as:**

- A. Proof the customer changed specifications
- B. An automatic reason to change limits
- C. A signal to investigate a special cause
- D. A normal point to ignore

**7. The center line of an Xbar chart is usually:**

- A. The grand average of subgroup means
- B. The upper specification limit
- C. The target without calculation
- D. The average range

**8. A u chart tracks:**

- A. Fraction nonconforming
- B. Subgroup averages
- C. Defects per unit with varying opportunity
- D. One individual measurement

**9. A process with Cp 1.50 and Cpk 0.70 is most likely:**

- A. Off center relative to its specifications
- B. Perfectly centered
- C. Free of variation
- D. Statistically unstable by definition

**10. An MSA study finds appraiser differences. The likely concern is:**

- A. Repeatability only
- B. Process capability
- C. Reproducibility
- D. Customer segmentation

**11. A Pareto chart should be used after the team:**

- A. Classifies occurrences into meaningful categories
- B. Calculates a confidence interval
- C. Builds a network diagram
- D. Completes a gage R&R;

**12. Stratifying defect data by shift is useful because it may:**

- A. Eliminate defects automatically
- B. Replace sampling
- C. Reveal patterns hidden in the overall total
- D. Guarantee a special cause

**13. An FMEA detection rating reflects:**

- A. Likelihood that current controls will detect the failure before impact
- B. Severity of the effect
- C. Frequency of the process
- D. Cost of the project

**14. If alpha is 0.01, the test is using:**

- A. A larger Type I error risk
- B. No Type II error
- C. A stricter threshold for false positives than alpha 0.05
- D. A guaranteed practical effect

**15. A 95 percent confidence interval for a mean difference excludes zero. This suggests:**

- A. A statistically significant difference at approximately alpha 0.05
- B. No possible difference
- C. A guaranteed large effect
- D. The gage is accurate

**16. A paired design is valuable because it:**

- A. Eliminates all random error
- B. Requires no data collection
- C. Controls for baseline differences within matched units
- D. Can only test proportions

**17. A residual pattern that curves systematically suggests:**

- A. The fitted linear form may be inadequate
- B. The mean is always wrong
- C. The data are categorical
- D. Specifications changed

**18. Randomization in an experiment is intended to:**

- A. Guarantee customer satisfaction
- B. Replace blocking in all cases
- C. Reduce bias from uncontrolled time or nuisance effects
- D. Eliminate measurement error

**19. Blocking is especially helpful when:**

- A. A known nuisance factor cannot be eliminated
- B. No factors are studied
- C. The response is not measured
- D. The team needs a charter

**20. A weighted decision matrix is used to:**

- A. Calculate a control limit
- B. Determine gage bias
- C. Compare alternatives against agreed criteria
- D. Build a histogram

**21. A standardized work instruction should include:**

- A. Key steps, critical details, and expected sequence
- B. Only a mission statement
- C. Only the final metric
- D. Every historical failure

**22. A leading metric is useful because it:**

- A. Is always financial
- B. Is identical to a lagging measure
- C. Signals conditions before the final outcome occurs
- D. Eliminates the need for controls

**23. The critical path is important because:**

- A. Delays on it delay the overall project finish
- B. It always has the most tasks
- C. It is the least expensive route
- D. It includes every task

**24. A process map can reveal:**

- A. Only the process mean
- B. Only the cost of quality
- C. Handoffs, rework loops, and decision points
- D. Only customer demographics

**25. The Lean waste of overproduction occurs when:**

- A. Work is produced earlier or in greater quantity than needed
- B. A customer receives the correct service
- C. A process is standardized
- D. A team measures cycle time

**26. In a Green Belt project, a project team is selecting projects. Which criterion best demonstrates strategic alignment?**

- A. Largest team available
- B. Most complex data set
- C. Shortest charter
- D. Direct support of a stated business objective

**27. In a Green Belt project, which is a measurable CTQ for call-center responsiveness?**

- A. Friendly service
- B. Percent of calls answered within 30 seconds
- C. Good teamwork
- D. Modern software

**28. In a Green Belt project, a process boundary should identify:**

- A. Only its annual cost
- B. Every potential solution
- C. Only the sponsor name
- D. Where the process starts and stops

**29. In a Green Belt project, attribute data are:**

- A. Measurements on a continuous scale
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**30. In a Green Belt project, why use a median when data are highly skewed?**

- A. It always has a smaller standard deviation
- B. It replaces the need for a histogram
- C. It proves normality
- D. It is less influenced by extreme values

**31. In a Green Belt project, a data point beyond a control limit should first be treated as:**

- A. Proof the customer changed specifications
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**32. In a Green Belt project, the center line of an Xbar chart is usually:**

- A. The upper specification limit
- B. The target without calculation
- C. The average range
- D. The grand average of subgroup means

**33. In a Green Belt project, a u chart tracks:**

- A. Fraction nonconforming
- B. Defects per unit with varying opportunity
- C. Subgroup averages
- D. One individual measurement

**34. In a Green Belt project, a process with  $C_p$  1.50 and  $C_{pk}$  0.70 is most likely:**

- A. Perfectly centered
- B. Free of variation
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**35. In a Green Belt project, an MSA study finds appraiser differences. The likely concern is:**

- A. Repeatability only
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**36. In a Green Belt project, a Pareto chart should be used after the team:**

- A. Calculates a confidence interval
- B. Builds a network diagram
- C. Completes a gage R&R;
- D. Classifies occurrences into meaningful categories

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- A. Severity of the effect
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- A. A larger Type I error risk
- B. A stricter threshold for false positives than alpha 0.05
- C. No Type II error
- D. A guaranteed practical effect

**40. In a Green Belt project, a 95 percent confidence interval for a mean difference excludes zero. This suggests:**

- A. No possible difference
- B. A guaranteed large effect
- C. The gage is accurate
- D. A statistically significant difference at approximately alpha 0.05

**41. In a Green Belt project, a paired design is valuable because it:**

- A. Eliminates all random error
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**44. In a Green Belt project, blocking is especially helpful when:**

- A. No factors are studied
- B. The response is not measured
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**47. In a Green Belt project, a leading metric is useful because it:**

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**50. In a Green Belt project, the Lean waste of overproduction occurs when:**

- A. A customer receives the correct service
- B. A process is standardized
- C. A team measures cycle time
- D. Work is produced earlier or in greater quantity than needed

**51. A project goal statement should be written as:**

- A. A list of suspected causes
- B. A measurable desired result with a deadline
- C. A detailed solution design
- D. A general wish to improve

**52. A SIPOC customer is best described as:**

- A. The process owner only
- B. The supplier of raw material
- C. The finance department only
- D. The recipient of the process output

**53. In a data plan, sampling frequency should be based on:**

- A. The analyst preference alone
- B. The decision needed and process behavior
- C. The last project schedule
- D. The color of the form

**54. A discrete variable is:**

- A. Invoice processing time
- B. Temperature in a furnace
- C. Diameter of a shaft
- D. Number of errors per order

**55. The interquartile range describes:**

- A. The total range
- B. The spread of the middle 50 percent of observations
- C. The average of all values
- D. The specification width

**56. A process can be stable but still fail customers when:**

- A. It has no control chart
- B. Its mean is calculated
- C. It uses rational subgroups
- D. Its predictable variation exceeds specifications

**57. A p chart is preferred over an np chart when:**

- A. Data are continuous
- B. Sample sizes vary
- C. Defects per unit are counted
- D. Only one observation exists

**58. A process has LSL 40, USL 60, mean 50, and sigma 2.5. Cp equals:**

- A. 0.80
- B. 1.00
- C. 2.00
- D. 1.33

**59. Why distinguish control limits from specification limits?**

- A. They are always numerically identical
- B. They serve different purposes: process behavior versus customer requirements
- C. Only control limits matter
- D. Only specifications are statistical

**60. A bias study compares:**

- A. Two operators only
- B. Two process means
- C. Current cost to planned cost
- D. Average measurement to a known reference value

**61. A scatter plot shows a positive association. What is warranted?**

- A. Declare X causes Y
- B. Investigate the relationship; do not assume causation
- C. Change both specifications
- D. Ignore the data

**62. A 5 Whys session should stop when:**

- A. The fifth question is asked regardless
- B. Someone suggests a solution
- C. The sponsor leaves
- D. The team reaches a verifiable, actionable causal mechanism

**63. A hypothesis test starts with a null hypothesis that typically states:**

- A. The preferred solution is correct
- B. No difference or no effect
- C. The effect is large
- D. The project has closed

**64. Power increases when, all else equal:**

- A. Measurement error increases
- B. Effect size shrinks
- C. Alpha is set to zero
- D. Sample size increases

**65. When comparing two independent group means, a common starting test is:**

- A. Paired t test
- B. Two-sample t test
- C. Chi-square independence test
- D. p chart

**66. The response variable in regression is:**

- A. A factor fixed by the experimenter only
- B. A nuisance block
- C. A randomization rule
- D. The outcome being predicted or explained

**67. An interaction plot with nonparallel lines suggests:**

- A. All factors are insignificant
- B. The effect of one factor depends on another factor
- C. No replication is needed
- D. The response has no variation

**68. Replication in a DOE permits the team to:**

- A. Avoid analysis
- B. Eliminate interactions
- C. Set specifications
- D. Estimate experimental error and improve precision

**69. A pilot is successful when it:**

- A. Uses the largest possible rollout
- B. Demonstrates improvement while meeting predefined success and risk criteria
- C. Avoids measuring outcomes
- D. Removes all controls

**70. Poka-yoke is most effective when it:**

- A. Depends only on a reminder sign
- B. Inspects after delivery
- C. Adds more forms
- D. Prevents an error at its source

**71. A reaction plan should be triggered by:**

- A. Personal preference only
- B. Defined signals or thresholds that require response
- C. Any normal data point
- D. The project charter date

**72. A control plan owner is responsible for:**

- A. Approving every project charter
- B. Writing all customer surveys
- C. Changing specifications alone
- D. Maintaining monitoring and acting on defined signals

**73. A stakeholder with high influence and high interest should receive:**

- A. Minimal updates
- B. Active engagement and frequent communication
- C. No access to results
- D. Only a final report

**74. Takt time is calculated as:**

- A. Demand divided by available time
- B. Defects divided by opportunities
- C. Specification width divided by sigma
- D. Available work time divided by customer demand

**75. A project closeout should confirm:**

- A. Only the final presentation date
- B. Benefits, control ownership, and lessons learned
- C. Only the team roster
- D. Only the original problem

**76. In a Green Belt project, a project goal statement should be written as:**

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- A. All factors are insignificant
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  - C. The effect of one factor depends on another factor
  - D. The response has no variation
- 93. In a Green Belt project, replication in a DOE permits the team to:**
- A. Estimate experimental error and improve precision
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  - C. Eliminate interactions
  - D. Set specifications
- 94. In a Green Belt project, a pilot is successful when it:**
- A. Uses the largest possible rollout
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  - D. Removes all controls
- 95. In a Green Belt project, poka-yoke is most effective when it:**
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  - C. Inspects after delivery
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- A. Personal preference only
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  - D. The project charter date
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  - C. Writing all customer surveys
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- 98. In a Green Belt project, a stakeholder with high influence and high interest should receive:**
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**100. In a Green Belt project, a project closeout should confirm:**

- A. Only the final presentation date
- B. Only the team roster
- C. Benefits, control ownership, and lessons learned
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# Answer Key and Rationales

**1. A**

Alignment ties the project to a measurable organizational priority.

**2. C**

A CTQ must be operationally defined and measurable.

**3. A**

Boundaries prevent scope drift and clarify handoffs.

**4. C**

Pass/fail, defect counts, and categories are attribute data.

**5. A**

The median gives a robust center for skewed distributions.

**6. C**

Control-chart signals prompt investigation, not automatic adjustment.

**7. A**

The Xbar center line estimates the process average.

**8. C**

Use a u chart when the inspection unit or exposure varies.

**9. A**

The large difference indicates centering is limiting capability.

**10. C**

Different operators obtaining different results indicates reproducibility variation.

**11. A**

Pareto analysis ranks categorical contributors.

**12. C**

Stratification separates potentially different sources of variation.

**13. A**

Detection measures the ability of controls to catch the issue.

**14. C**

Lower alpha reduces the chance of a Type I error.

**15. A**

For a two-sided comparison, excluding zero corresponds to rejecting no difference at the matched level.

**16. C**

Analyzing within-pair differences can increase sensitivity.

**17. A**

Curvature in residuals often indicates missing nonlinearity.

**18. C**

Random order distributes lurking influences across treatments.

**19. A**

Blocks isolate known background variation such as day, machine, or raw-material lot.

**20. C**

It makes solution selection transparent and consistent.

**21. A**

Standard work documents the current best known method.

**22. C**

Leading measures support proactive correction.

**23. A**

Critical-path activities have no schedule float.

**24. C**

Mapping makes workflow and hidden complexity visible.

**25. A**

Overproduction creates excess inventory, delay, and obscured problems.

**26. D**

Alignment ties the project to a measurable organizational priority.

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**51. B**

A strong goal quantifies the desired improvement and its time frame.

**52. D**

Customers can be internal or external users of outputs.

**53. B**

Sampling must produce data fit for the decision and capture relevant variation.

**54. D**

Counts take distinct values and are discrete.

**55. B**

IQR is Q3 minus Q1 and is resistant to extreme values.

**56. D**

Stability and capability answer different questions.

**57. B**

A p chart tracks a fraction; np assumes constant subgroup size.

**58. D**

$C_p = (60 - 40) / (6 \times 2.5) = 1.33$ .

**59. B**

Control limits are calculated from data; specifications define acceptability.

**60. D**

Bias is systematic difference from a reference.

**61. B**

Association can guide inquiry but does not prove a causal mechanism.

**62. D**

Five is a guide; evidence and actionability matter more than a fixed count.

**63. B**

The null provides the baseline claim tested with evidence.

**64. D**

More information generally improves the chance of detecting a real effect.

**65. B**

A two-sample t test evaluates a difference in independent continuous means.

**66. D**

Regression models the response as a function of predictors.

**67. B**

Nonparallel patterns are visual evidence of interaction.

**68. D**

Repeated experimental runs quantify random run-to-run variation.

**69. B**

A pilot provides bounded evidence before full implementation.

**70. D**

Prevention is stronger than detection or reliance on memory.

**71. B**

It turns monitoring into timely, consistent action.

**72. D**

Named ownership sustains the new process after handoff.

**73. B**

High-influence, high-interest stakeholders are managed closely.

**74. D**

Takt establishes the pace needed to meet demand.

**75. B**

Closure verifies results and transfers responsibility for sustaining gains.

**76. C**

A strong goal quantifies the desired improvement and its time frame.

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