

Certified Six Sigma Green Belt

STUDY GUIDE | EXAM 8

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. 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

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

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

3. 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

4. In a Green Belt project, a SIPOC customer is best described as:

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

5. 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

6. In a Green Belt project, in a data plan, sampling frequency should be based on:

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

7. In a Green Belt project, attribute data are:

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

8. In a Green Belt project, a discrete variable is:

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

9. 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

10. In a Green Belt project, the interquartile range describes:

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

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

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

12. In a Green Belt project, a process can be stable but still fail customers when:

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

13. 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

14. In a Green Belt project, a p chart is preferred over an np chart when:

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

15. 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

16. In a Green Belt project, a process has LSL 40, USL 60, mean 50, and sigma 2.5. Cp equals:

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

17. In a Green Belt project, a process with Cp 1.50 and Cpk 0.70 is most likely:

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

18. In a Green Belt project, why distinguish control limits from specification limits?

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

19. In a Green Belt project, an MSA study finds appraiser differences. The likely concern is:

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

20. In a Green Belt project, a bias study compares:

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

21. 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

22. In a Green Belt project, a scatter plot shows a positive association. What is warranted?

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

23. In a Green Belt project, stratifying defect data by shift is useful because it may:

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

24. In a Green Belt project, a 5 Whys session should stop when:

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

25. In a Green Belt project, an FMEA detection rating reflects:

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

26. In a Green Belt project, a hypothesis test starts with a null hypothesis that typically states:

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

27. In a Green Belt project, if alpha is 0.01, the test is using:

- 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

28. In a Green Belt project, power increases when, all else equal:

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

29. 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

30. In a Green Belt project, when comparing two independent group means, a common starting test is:

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

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

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

32. In a Green Belt project, the response variable in regression is:

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

33. In a Green Belt project, a residual pattern that curves systematically suggests:

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

34. In a Green Belt project, an interaction plot with nonparallel lines suggests:

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

35. In a Green Belt project, randomization in an experiment is intended to:

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

36. In a Green Belt project, replication in a DOE permits the team to:

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

37. In a Green Belt project, blocking is especially helpful when:

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

38. In a Green Belt project, a pilot is successful when it:

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

39. In a Green Belt project, a weighted decision matrix is used to:

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

40. In a Green Belt project, poka-yoke is most effective when it:

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

41. In a Green Belt project, a standardized work instruction should include:

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

42. In a Green Belt project, a reaction plan should be triggered by:

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

43. In a Green Belt project, a leading metric is useful because it:

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

44. In a Green Belt project, a control plan owner is responsible for:

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

45. In a Green Belt project, the critical path is important because:

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

46. In a Green Belt project, a stakeholder with high influence and high interest should receive:

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

47. In a Green Belt project, a process map can reveal:

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

48. In a Green Belt project, takt time is calculated as:

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

49. 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

50. 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
- D. Only the original problem

51. 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

52. A project goal statement should be written as:

- A. A list of suspected causes
- B. A measurable desired result with a deadline
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- C. The finance department only
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55. 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

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

- A. The analyst preference alone
- B. The decision needed and process behavior
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57. Attribute data are:

- A. Measurements on a continuous scale
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- A. It is less influenced by extreme values
- B. It always has a smaller standard deviation
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- A. The total range
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- 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

62. 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

63. 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
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64. A p chart is preferred over an np chart when:

- A. Data are continuous
- B. Sample sizes vary
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- A. Off center relative to its specifications
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- A. Repeatability only
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70. 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

71. 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
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- A. Declare X causes Y
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86. Replication in a DOE permits the team to:

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

87. 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

88. A pilot is successful when it:

- A. Uses the largest possible rollout
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- C. Only the final metric
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- 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

99. 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

100. 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

Answer Key and Rationales

1. D

Alignment ties the project to a measurable organizational priority.

2. C

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

3. B

A CTQ must be operationally defined and measurable.

4. A

Customers can be internal or external users of outputs.

5. D

Boundaries prevent scope drift and clarify handoffs.

6. C

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

7. B

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

8. A

Counts take distinct values and are discrete.

9. D

The median gives a robust center for skewed distributions.

10. C

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

11. B

Control-chart signals prompt investigation, not automatic adjustment.

12. A

Stability and capability answer different questions.

13. D

The Xbar center line estimates the process average.

14. C

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

15. B

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

16. A

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

17. D

The large difference indicates centering is limiting capability.

18. C

Control limits are calculated from data; specifications define acceptability.

19. B

Different operators obtaining different results indicates reproducibility variation.

20. A

Bias is systematic difference from a reference.

21. D

Pareto analysis ranks categorical contributors.

22. C

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

23. B

Stratification separates potentially different sources of variation.

24. A

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

25. D

Detection measures the ability of controls to catch the issue.

26. C

The null provides the baseline claim tested with evidence.

27. B

Lower alpha reduces the chance of a Type I error.

28. A

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

29. D

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

30. C

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

31. B

Analyzing within-pair differences can increase sensitivity.

32. A

Regression models the response as a function of predictors.

33. D

Curvature in residuals often indicates missing nonlinearity.

34. C

Nonparallel patterns are visual evidence of interaction.

35. B

Random order distributes lurking influences across treatments.

36. A

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

37. D

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

38. C

A pilot provides bounded evidence before full implementation.

39. B

It makes solution selection transparent and consistent.

40. A

Prevention is stronger than detection or reliance on memory.

41. D

Standard work documents the current best known method.

42. C

It turns monitoring into timely, consistent action.

43. B

Leading measures support proactive correction.

44. A

Named ownership sustains the new process after handoff.

45. D

Critical-path activities have no schedule float.

46. C

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

47. B

Mapping makes workflow and hidden complexity visible.

48. A

Takt establishes the pace needed to meet demand.

49. D

Overproduction creates excess inventory, delay, and obscured problems.

50. C

Closure verifies results and transfers responsibility for sustaining gains.

51. A

Alignment ties the project to a measurable organizational priority.

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