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Lean Six Sigma Yellow Belt

Six Sigma LSSYB

Version Demo

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Topic Break Down

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QUESTION NO: 1

Which two of the following are responsibilities of a Lean Six Sigma Project Champion? (Choose two.)

A. Removing organizational barriers

B. Providing direction and support to the project team

C. Collecting every project data point personally

D. Performing all process steps for the team

ANSWER: A B

Explanation:

Removing organizational barriers and **providing direction and support to the project team** are correct. A Project Champion is a management sponsor who helps ensure the project remains aligned with business priorities, has appropriate resources, and receives support when issues extend beyond the team's authority.

The Champion does not normally perform all project data collection or create every detailed process map. Those activities are generally performed by the Belt and project team members, who have direct knowledge of the process and participate in the DMAIC work. Effective sponsorship is important because many improvements require cross-functional coordination, leadership decisions, or assistance in resolving barriers.

QUESTION NO: 2

Which two of the following are benefits of stratifying process data? (Choose two.)

A. Revealing differences among shifts, suppliers, or product types

B. Helping identify where additional investigation should be focused

C. Proving that a category is the root cause

D. Eliminating the need for data analysis

ANSWER: A B

Explanation:

Revealing differences among shifts, suppliers, or product types and **helping identify where additional investigation should be focused** are correct. Stratification separates combined data into meaningful groups so that patterns hidden in an overall average can become visible. For example, an overall defect rate may appear acceptable while one shift or supplier has a substantially higher rate.

Stratification does not prove that a category causes the problem, nor does it eliminate the need to validate suspected causes with additional evidence. It is an effective way to organize data and develop focused questions for further analysis. See ASQ's Stratification resource.

QUESTION NO: 3

One of the most popular measures of variability in a data set or population is _____.

A. Dispersion

B. Variation

C. Mean

D. Standard Deviation

ANSWER: D

Explanation:

Standard Deviation is a widely used measure of variability because it quantifies the typical amount by which individual observations differ from the mean. A small standard deviation indicates that values tend to cluster closely around the average, whereas a large standard deviation indicates that observations are more spread out. In Lean Six Sigma, this measure is especially useful for describing process variation, establishing a baseline for process performance, and evaluating whether improvement efforts reduce inconsistency. It is expressed in the same units as the original data, which makes its interpretation practical for process teams. For a population, standard deviation is calculated using every population value; for a sample, a closely related sample standard deviation is used to estimate population variability. Standard deviation is also foundational to many Six Sigma statistical tools, including capability analysis, control charts, normal-distribution analysis, and calculation of sigma levels. The National Institute of Standards and Technology describes standard deviation as a measure of spread or dispersion of data values around their mean: NIST Engineering Statistics Handbook. The American Society for Quality also identifies standard deviation as a key statistical measure used in quality improvement: ASQ Standard Deviation resource.

QUESTION NO: 4

Which of the following are appropriate actions after a team identifies a high-risk failure mode in an FMEA? (Choose two.)

A. Reduce the likelihood that the cause will occur

B. Improve the ability to detect the failure before it reaches the customer

C. Change the ratings without changing the process

D. Remove the failure mode from the FMEA

E. Delay action until a customer complaint is received

ANSWER: A B

Explanation:

Reduce the likelihood that the cause will occur and **improve the ability to detect the failure before it reaches the customer** are correct. FMEA is used to identify potential failure modes, their effects, causes, and existing controls. Risk reduction actions may prevent the cause, reduce the severity where feasible, or improve detection before the failure affects a customer or downstream process.

Simply changing ratings without improving the process does not reduce risk. Likewise, removing the failure mode from the analysis conceals risk rather than controlling it. Actions should be assigned to responsible owners and verified for effectiveness after implementation. See ASQ's FMEA resource.

QUESTION NO: 5

Which of these defects per million opportunity (DPMO) levels approximate to four Sigma quality?

A. 308357

B. 66807

C. 6210

D. 233

ANSWER: C

Explanation:

6210 is the approximate defects-per-million-opportunities level for four-sigma performance under the conventional Six Sigma conversion table, which incorporates the commonly used 1.5-sigma long-term process shift. Sigma level expresses process capability as the distance between the process mean and the nearest specification limit, measured in standard deviations. As the sigma level increases, the probability that an opportunity produces a defect decreases substantially. On the standard long-term Six Sigma scale, a four-sigma process yields approximately 6,210 defects per million opportunities, equivalent to about 99.379% yield. DPMO is useful because it normalizes defect performance by the number of genuine opportunities for a defect, allowing processes with different product volumes or complexity to be compared consistently. In Yellow Belt work, this value is generally used as a benchmark for interpreting baseline capability, setting improvement targets, and communicating the practical impact of variation reduction. The convention should be stated when reporting sigma metrics because some tables use short-term capability without the 1.5-sigma shift. See the ASQ Six Sigma overview and the iSixSigma DPMO reference for further context on these measures.

QUESTION NO: 6

Which two of the following are examples of discrete data? (Choose two.)

A. Number of customer complaints received

B. Cycle time in minutes

C. Temperature of a process

D. Number of defective parts found

ANSWER: A D

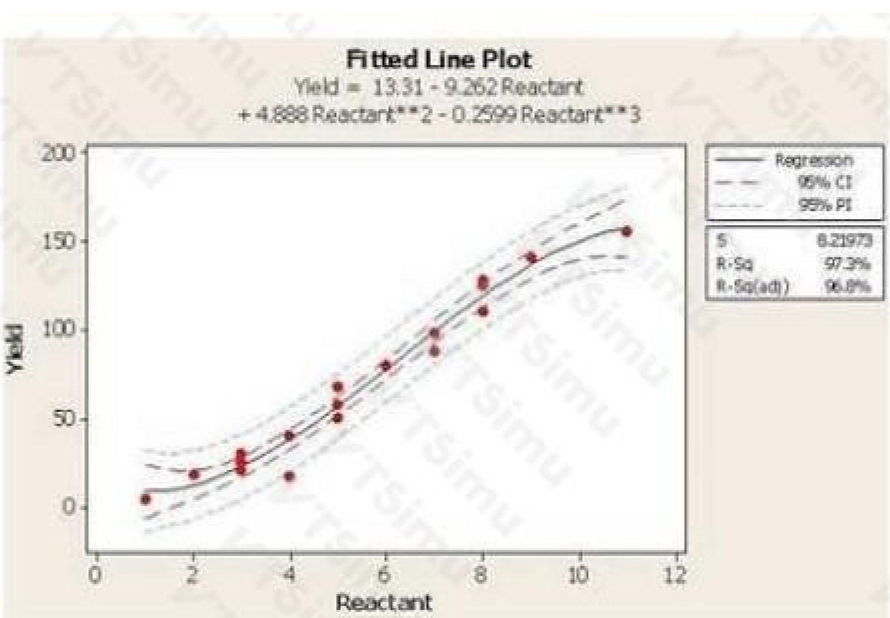
Explanation:

Number of customer complaints received and **number of defective parts found** are correct because both are counts. Discrete data can take only distinct, countable values, such as 0, 1, 2, and so forth. A team may use discrete data to measure defects, errors, incidents, returns, or the number of transactions requiring rework.

Cycle time and temperature are continuous data because they can be measured at any value within a range, depending on the precision of the measurement system. Understanding the data type is important because it influences the appropriate graph, summary statistic, capability method, and statistical analysis. See NIST guidance on data types.

QUESTION NO: 7

Which statement is NOT correct about the Fitted Line Plot shown here?



A. The independent variable is the reactant

B. If the reactant was 6 units, with 95 % confidence we would expect a minimum yield of 100 units

C. With at least 95% confidence, we can expect less than 10 units of Yield when the reactant is at a value of 1

D. A reactant value between 2 and 4 units yields around 20 to 40

ANSWER: D

Explanation:

The statement “A reactant value between 2 and 4 units yields around 20 to 40” is not correct because the fitted-line relationship shown by the plot indicates that yield rises more steeply across this range. Reading the fitted line, a reactant level near 2 corresponds to a yield of approximately 20 units, but a level near 4 corresponds to approximately 60 units rather than 40 units. Thus, the fitted values over the stated reactant interval are closer to about 20 through 60 units. A fitted line plot is used to display the estimated linear relationship between a predictor (the reactant) and a response (yield), while the displayed confidence bounds support inference about the mean response at particular predictor values. Consequently, conclusions should be read from the line and its confidence interval at the relevant reactant value, rather than treating the relationship as a narrower 20-to-40 yield range. This interpretation follows standard linear-regression practice: the regression equation and fitted line estimate the mean response, and confidence intervals quantify uncertainty in that estimated mean. See the NIST overview of simple linear regression and the Minitab guidance for interpreting fitted line plots.

QUESTION NO: 8

Which two of the following conditions must generally be present for an activity to be considered value added from the customer perspective? (Choose two.)

A. The activity must transform the product, service, or information

B. The customer must be willing to pay for the activity

C. The activity must require management approval

D. The activity must be performed by a specialist

E. The activity must create an inspection record

ANSWER: A B

Explanation:

The activity must transform the product, service, or information and **the customer must be willing to pay for the activity** are correct. Lean considers work value added when it changes the product, service, or information in a way the customer values and would be willing to pay for. The activity must also be performed correctly the first time, although that condition is not listed here.

Inspection, rework, and waiting may be necessary under current operating conditions, but they generally do not add value from the customer perspective. Lean improvement seeks to reduce or eliminate such non-value-added activities while preserving work required to create customer value. See Lean Enterprise Institute's overview of Lean and ASQ's Lean resource.

QUESTION NO: 9

_____________ represents all the variation that one can expect to experience from the output of the subject process.

A. A Standard Deviation

B. Data range

C. Long-term Data

D. The Mode

ANSWER: C

Explanation:

Long-term Data represents all variation that can reasonably be expected from a process output over time. Unlike a short, tightly controlled observation, long-term data reflects the process as it actually operates across normal shifts, operators, materials, equipment conditions, environmental changes, setup changes, and other time-related sources of variation. It therefore provides the broader, real-world view of process performance that a customer is likely to experience.

In Lean Six Sigma, this distinction is important when assessing process capability and performance. A process may appear highly consistent during a brief study, yet show substantially more variation when measured over an extended period under routine operating conditions. Long-term data is consequently the appropriate basis for understanding sustained output behavior and for evaluating whether the process can consistently meet specifications. The American Society for Quality discusses Six Sigma's focus on reducing process variation and improving sustained performance at ASQ: Six Sigma. Additional statistical guidance on evaluating process capability and variation over operational conditions is available in the NIST/SEMATECH e-Handbook of Statistical Methods.

QUESTION NO: 10

Process mapping is:

A. a onetime event

B. a tool used for statistical validation

C. a tool used at the end of the DMAIC process

D. an ongoing living document used throughout the DMAIC process

ANSWER: D

Explanation:

An ongoing living document used throughout the DMAIC process is correct because a process map visually records the sequence of activities, decisions, inputs, outputs, handoffs, and participants that make up a process. In Lean Six Sigma, the team commonly creates an initial high-level map during Define to establish scope and a shared understanding of the current process. It is then refined as the team gathers facts in Measure, identifies sources of variation and waste in Analyze, designs changes in Improve, and documents the standardized future-state process for Control.

Calling the map a living document reflects good improvement practice: the team updates it when direct observation, data collection, stakeholder input, or process changes reveal a more accurate picture. This keeps the map aligned with the actual work rather than assumptions about how work is performed. Process maps also support clear communication across functions, help identify measurement locations and potential failure points, and provide a reference for sustaining the improved process. ASQ describes flowcharts/process maps as tools for depicting process steps and understanding or improving processes; see ASQ's Flowchart resource. The DMAIC framework's iterative use of process knowledge is also outlined by ASQ's DMAIC resource.

QUESTION NO: 11

Six Sigma is a:

A. Quality tool with several options to reduce cost

B. statistical basis of measurement which allows 3.4 defects per million opportunities

C. scientific basis of measurement which allows 3.4 defects per hundred thousand opportunities

D. ISO provided model in Quality

ANSWER: B

Explanation:

The correct definition is “statistical basis of measurement which allows 3.4 defects per million opportunities.” Six Sigma is fundamentally a data-driven quality-management methodology and performance benchmark that uses statistical thinking to reduce process variation and defects. At the Six Sigma quality level, a process is conventionally associated with no more than 3.4 defects per million opportunities, after accounting for the commonly used 1.5-sigma long-term shift. An “opportunity” is a measurable chance for a defect to occur within a unit, transaction, or process output; therefore, the metric evaluates quality relative to the number of possible defect occurrences, rather than merely counting defective units.

This benchmark gives teams a common, quantitative way to describe process capability and set ambitious improvement goals. In Lean Six Sigma work, practitioners use this performance perspective alongside the DMAIC improvement framework to define customer-critical requirements, measure current performance, analyze root causes of variation, implement improvements, and sustain control. The American Society for Quality’s Six Sigma overview describes Six Sigma as a method that improves business processes through statistical analysis, while NIST’s Six Sigma methodology resource discusses its structured use for defect and variation reduction.

QUESTION NO: 12

Which of the following are characteristics of a Kaizen event? (Choose two.)

A. A cross-functional team focuses on a defined improvement opportunity

B. Changes are tested and implemented rapidly where appropriate

C. Only managers participate in the event

D. All process changes are postponed until the next fiscal year

E. The team ignores the current-state process

ANSWER: A B

Explanation:

A cross-functional team focuses on a defined improvement opportunity and **changes are tested and implemented rapidly where appropriate** are correct. A Kaizen event is a focused, short-duration improvement activity in which people who understand and perform the work examine a defined process problem, identify waste or barriers, and implement practical improvements.

Kaizen events rely on direct observation, team participation, rapid learning, and follow-up to sustain the changed process. They do not require postponing all action until a lengthy analysis is complete, and they should not be limited to managers because process knowledge from employees is essential. See Lean Enterprise Institute's Kaizen definition.

QUESTION NO: 13

______ is a document that provides a framework and objective for an improvement project.

A. Goal Statement

B. Business Case

C. Problem Statement

D. Project Charter

E. Project Scope

ANSWER: D

Explanation:

A **Project Charter** is the formal document used to establish an improvement project and give it clear direction. In Lean Six Sigma, it provides the high-level framework that aligns the team's work with organizational needs. The charter typically records the business case, problem statement, goal statement, project scope, expected benefits, team members, milestones, and any important constraints or assumptions. By documenting these elements at the beginning of the effort, the charter creates a shared understanding of what the project is intended to achieve and the boundaries within which the team will operate.

The objective portion of the charter should be specific and measurable, often expressed as a target improvement and a completion timeframe. This focus helps the team select appropriate measures, avoid uncontrolled expansion of work, and obtain authorization and support from the project sponsor. The Project Charter is therefore commonly developed during the Define phase of DMAIC, before detailed analysis and solution implementation begin. ASQ describes a project charter as a document that defines a project's objectives, scope, and responsibilities; its Lean Six Sigma resources also position the charter as a core Define-phase deliverable. See ASQ's Project Charter resource and ASQ's DMAIC Define Phase overview.

QUESTION NO: 14

What is the outcome of Hypothesis Testing, where P Value > = 0.05?

A. Accept Alternate Hypothesis

B. Reject Null

C. Fail to reject the Null Hypothesis

D. Data is normal

ANSWER: C

Explanation:

Assuming the test's preselected significance level is 0.05, a p-value greater than or equal to 0.05 leads to the decision to **fail to reject the null hypothesis**. The p-value measures how compatible the observed result (or a more extreme result) is with the data-generating assumptions represented by the null hypothesis. When it is not smaller than the chosen alpha level, the sample does not provide sufficient statistical evidence at that level to conclude that the hypothesized effect, difference, or relationship is present.

In Lean Six Sigma work, this decision means the team should retain the null hypothesis as the working conclusion for the stated test and avoid claiming a statistically significant process change or difference based on these data. "Fail to reject" is the technically appropriate wording rather than "accept," because a nonsignificant result does not prove that the null hypothesis is true; it states only that the available evidence did not meet the predefined threshold for rejection. The significance level must be established before interpreting results. See the NIST/SEMATECH e-Handbook discussion of hypothesis testing and the American Statistical Association's statement on p-values.

QUESTION NO: 15

The Organization Specification limits are + 5 or – 5 % where as Control Limits are + 6 % & -2% , justify whether the Process is.

A. Stable

B. Capable

C. Within control

D. None of the above

ANSWER: D

Explanation:

“None of the above

” is correct because the stated limits do not support any of the listed process-status conclusions. Specification limits express the customer or organizationally acceptable output range, which here is from −5% to +5%. Control limits are calculated from observed process performance and describe the range expected from a stable process over time. The upper control limit of +6% extends beyond the upper specification limit of +5%, meaning the process’s expected natural variation can produce results outside the allowable requirement. Therefore, the process cannot be justified as capable from these limits.

In addition, control limits by themselves do not establish that a process is stable or within statistical control. Those conclusions require a control-chart assessment of plotted data, including whether points and patterns indicate only common-cause variation. Since no chart observations or stability evidence are provided, neither status can be confirmed. Thus, none of the offered named classifications is justified by the information given. The American Society for Quality distinguishes specification limits, which come from customer requirements, from control limits, which are statistically derived from process data. See ASQ: Control Charts and NIST: Process Capability Indices.

QUESTION NO: 16

A _____ is used primarily to track the stability of the average value of a metric of interest.

A. NP Chart

B. Xbar-R Chart

C. I-MR Chart

D. C Chart

ANSWER: B

Explanation:

An Xbar-R Chart is used to assess the stability of a continuous metric when observations are collected in rational subgroups. Its Xbar component plots each subgroup’s average, making it the appropriate chart for monitoring whether the process mean, or average value of the metric of interest, remains statistically stable over time. The chart’s center line represents the overall process average, while its control limits provide an evidence-based expected range for subgroup averages when the process is affected only by common-cause variation. Points outside those limits, or nonrandom patterns within them, can signal that a special cause may be shifting the process average.

The R component is used alongside the Xbar component to monitor within-subgroup variation. Confirming that this short-term variation is stable is important because the interpretation of the subgroup-average control limits relies on a reliable estimate of process variation. In Lean Six Sigma work, this pairing lets a team distinguish a stable, predictable process mean from one that needs investigation before improvement decisions are made. The NIST/SEMATECH e-Handbook discussion of X-bar and R charts describes their use for subgroup averages and ranges; NIST also covers the underlying control-chart methodology.

QUESTION NO: 17

Which of the following are normally included in a control plan for an improved process? (Choose two.)

A. The method and frequency for monitoring critical measures

B. The reaction to take when performance is unacceptable

C. A record of all project-team meeting minutes

D. A requirement to stop monitoring after project closure

E. The personal performance reviews of all team members

ANSWER: A B

Explanation:

The method and frequency for monitoring critical measures and **the reaction to take when performance is unacceptable** are correct. A control plan documents how the process owner will sustain an improved process. It typically identifies the critical characteristics to control, target values or limits, measurement methods, sampling or monitoring frequency, responsible persons, and reaction actions if a problem occurs.

The control plan should support day-to-day process management after the project is closed. It is not a record of every project meeting, nor does it eliminate the need to monitor the process once improvement actions have been implemented. See ASQ's control plan resource.

QUESTION NO: 18

Kaizens or Kaikakus and Six Sigma projects are intended to create incremental process improvements versus breakthrough, significant improvements.

A. True

B. False

ANSWER: B

Explanation:

False is correct because Kaizen, Kaikaku, and Six Sigma do not all have the same improvement intent or scale. Kaizen refers to continuous, typically small and incremental improvements made through ongoing participation by people who perform the work. Kaikaku, in contrast, means radical or revolutionary change: it is used when a process requires a major, step-change redesign rather than a series of small refinements. Six Sigma projects are structured DMAIC improvement efforts that use data and statistical analysis to reduce defects, variation, and process waste. Depending on the project's baseline and objective, their results may be incremental or may deliver substantial, breakthrough-level performance gains. Therefore, it is inaccurate to characterize Kaikaku and Six Sigma projects collectively as being intended only for incremental improvement rather than significant improvement. Lean Enterprise Institute describes Kaizen as continuous improvement and Kaikaku as radical improvement, a distinction central to Lean practice. See the Lean Enterprise Institute's Kaizen definition and its Kaikaku definition.

QUESTION NO: 19

Which two of the following are examples of Lean waste? (Choose two.)

A. Moving completed work between distant work areas

B. Producing more units than are currently needed

C. Performing a required safety inspection

D. Completing work to a customer specification

ANSWER: A B

Explanation:

Moving completed work between distant work areas is transportation waste because materials, products, or information are being moved without being transformed in a way the customer values. **Producing more units than are currently needed** is overproduction waste because it creates output before a customer or downstream process requires it.

Lean recognizes that unnecessary movement, excess production, waiting, inventory, defects, overprocessing, and other non-value-added activities consume resources without increasing customer value. Preventing these wastes improves flow and can expose underlying process problems. See ASQ's Lean resource.

QUESTION NO: 20

An ANOVA used across many dependent variables could increase the Beta risk.

A. True

B. False

ANSWER: B

Explanation:

False is correct because the principal statistical concern when separate ANOVA tests are run for many dependent variables is an increased probability of a Type I error (alpha risk), not an inherent increase in Type II error (beta risk). Each ANOVA has its own significance test; as the number of tests rises, the chance of obtaining at least one statistically significant result merely by random variation rises above the selected per-test alpha level. This is commonly called the multiple-testing or familywise-error problem. ANOVA itself is designed to assess whether group means differ for one continuous response variable, while several correlated dependent variables may instead warrant a multivariate approach such as MANOVA. A team can also use a preplanned multiplicity-control method when multiple outcomes must be evaluated. Such controls can affect statistical power, but that is a consequence of the chosen correction and its design trade-off—not the direct risk stated in the question. For foundational definitions of Type I and Type II errors, see the NIST/SEMATECH e-Handbook. NIST also describes ANOVA as a method for comparing means across levels of a factor at its ANOVA guidance page.

QUESTION NO: 21

Multiple Linear Regressions (MLR) is best used when which of these are applicable?

A. We assume that the X's are independent of each other

B. Preventing the use of a Designed Experiment if unnecessary

C. Relationships between Y (output) and more than one X (Input)

D. All of the above

ANSWER: D

Explanation:

All of the above is correct because multiple linear regression is used to model, quantify, and predict the relationship between one continuous response, Y, and two or more input variables, Xs. It estimates each input's relationship with the output while holding the other included inputs constant, allowing a Yellow Belt team to identify potentially important process drivers from available data.

For the model's coefficient estimates to be stable and interpretable, the input variables should not be strongly linearly related to one another. In practical Six Sigma work, this is assessed as a multicollinearity concern, often using correlation analysis and variance inflation factors. Multiple linear regression can also be an efficient analysis when historical or operational data already provide sufficient evidence of input-output relationships. This can help a team prioritize the vital inputs and determine whether a more resource-intensive designed experiment is needed, rather than initiating one unnecessarily. Regression does not establish causation by itself; process knowledge and appropriate validation remain essential. The NIST Engineering Statistics Handbook describes multiple linear regression as a model with multiple predictor variables and discusses its assumptions and diagnostic considerations. See NIST: Multiple Linear Regression and NIST: Regression Diagnostics.

QUESTION NO: 22

The following Business Case is constructed properly.

“During 2009 the commercial loan division experienced a 2.7% default rate versus a target of less than .5%. This costs the bank in excess of $250,000 quarterly.”

A. True

B. False

ANSWER: A

Explanation:

True is correct because the statement supplies the essential content of a well-formed Lean Six Sigma business case: a defined business area, a measurable performance problem, a target or required performance level, a time frame, and quantified financial impact. It identifies the commercial loan division as the affected process area and expresses the gap in objective terms: a 2.7% default rate compared with a target below 0.5% during 2009. This makes the problem observable and establishes the magnitude of the performance shortfall without prematurely asserting a cause or prescribing a solution.

The quarterly cost exceeding $250,000 provides a clear business-impact rationale for prioritizing improvement work. Quantifying impact helps sponsors and project teams evaluate whether the opportunity merits resources and supports alignment with organizational financial objectives. The wording is appropriately problem-focused: it describes the undesirable current condition and its consequence rather than embedding assumptions about why defaults occurred. This is consistent with Six Sigma project-selection practice, in which a business case explains why improvement is needed and the value of addressing the identified gap. See the American Society for Quality's Six Sigma overview and iSixSigma's business-case definition.

QUESTION NO: 23

A process has its CPk value less than 1. The process is _____.

A. Stable

B. Capable

C. Not Capable

D. None of the above

ANSWER: C

Explanation:

Not Capable is correct. Cpk is a process capability index that compares the process's actual spread and centering with the closest specification limit. It is calculated using the smaller distance, in standard-deviation units, between the process mean and either the upper or lower specification limit. A Cpk value of 1 means the nearest specification limit is three standard deviations from the process mean. When Cpk is less than 1, the process variation extends beyond, or is expected to extend beyond, at least one specification limit. Therefore, the process cannot consistently produce output within customer or engineering requirements and is classified as not capable.

In Lean Six Sigma practice, capability indices should be interpreted after confirming that the process is statistically stable and that the measurement system and distribution assumptions are appropriate. Those conditions make the calculated Cpk a meaningful estimate of the process's ability to meet specifications. The key capability threshold tested here is that a value below 1 indicates inadequate capability relative to the stated specification limits. See the NIST/SEMATECH e-Handbook discussion of process capability indices and ASQ's process capability analysis resource.

QUESTION NO: 24

Control Charts were developed by Dr. Shewhart to track data over time. To detect Special Cause variation the Control Charts use which of these?

A. Data shift analysis

B. Outlier analysis methods

C. Center Line and Control Limits

D. None of the above

ANSWER: C

Explanation:

Center Line and Control Limits is correct. A Shewhart control chart plots process measurements in time order against a center line, which represents the process's typical level, and statistically derived upper and lower control limits, which represent the range expected from routine, common-cause variation. Special-cause variation is signaled when plotted data exhibit behavior that is unlikely if the process remains stable—for example, a point outside a control limit or a nonrandom pattern assessed using established run rules. These chart features let practitioners distinguish a process signal requiring investigation from normal, inherent process fluctuation. Control limits are calculated from observed process variation and should not be confused with specification limits, which are customer or engineering requirements rather than indicators of statistical control. The American Society for Quality describes control charts as tools for studying how a process changes over time and for identifying special-cause variation. The National Institute of Standards and Technology likewise explains that control charts use a center line and upper and lower control limits to evaluate process stability. See ASQ's Control Chart resource and the NIST Engineering Statistics Handbook.

QUESTION NO: 25

Sally and Sara sell flower pots at their garage sale. Sally motivates Sara mentioning that they will sell a minimum of 15 pots per day if the outside temperature exceeds 60º

F. From a sample, whose population is assumed to follow a Normal Distribution, taken for 30 days at 60 degrees or more an average of 13.6 pots per day were sold with a Standard Deviation of 0.7 pots. For the sales accomplished above, what test would validate if they met their requirements?

A. F Test

B. Test for Equal Variance

C. Chi Square Test

D. One-Sample t-Test

E. From a sample, whose population is assumed to follow a Normal Distribution, taken for 30 days at 60 degrees or more an average of 13.6 pots per day were sold with a Standard Deviation of 0.7 pots. For the sales accomplished above, what test would validate if they met their requirements?

ANSWER: D

Explanation:

The correct test is **One-Sample t-Test** because the business requirement specifies one population mean: average daily sales of at least 15 flower pots when the temperature is 60 degrees or higher. The sample provides a single group of 30 qualifying days, with a sample mean of 13.6 pots and a sample standard deviation of 0.7 pots. Therefore, the appropriate analysis compares the observed sample mean with the stated benchmark of 15 pots.

A one-sample t-test is designed for inference about a population mean when the population standard deviation is not known and must be estimated from the sample standard deviation. The stated normal-population assumption supports use of this test, and the sample size of 30 also provides a reasonable basis for mean-based inference. In this setting, the hypotheses can be structured around the minimum requirement, such as testing whether the true mean daily sales are at least 15 versus below 15. The resulting t statistic and p-value provide evidence for deciding whether the sales process satisfies the minimum daily-sales claim. NIST describes one-sample t procedures for comparing a sample mean to a specified value in its Engineering Statistics Handbook. See also the one-sample t-test overview for the role of an unknown population standard deviation.

QUESTION NO: 26

Which two of the following are common causes of variation that may be investigated during a process-improvement project? (Choose two.)

A. Different methods used by operators

B. Variation in incoming material

C. A clearly defined customer requirement

D. A stable measurement procedure

ANSWER: A B

Explanation:

Different methods used by operators and **variation in incoming material** are correct. When operators use different procedures or suppliers provide inputs with inconsistent characteristics, the process output may vary. These possible causes can be explored through process mapping, direct observation, stratification, data collection, and root-cause analysis.

A clearly defined customer requirement and a stable measurement procedure are not, by themselves, causes of process variation. They are controls or references that help the team assess whether variation exists and whether output meets requirements. A fishbone diagram often organizes suspected causes into categories such as people, methods, materials, machines, measurement, and environment. See ASQ's Fishbone Diagram resource.

QUESTION NO: 27

A Belt will occasionally do a quick experiment referred to as an OFAT which stands for _____.

A. Only a Few Are Tested

B. Opposite Factors Affect Technique

C. One Factor At a Time

D. Ordinary Fractional Approach Technique

ANSWER: C

Explanation:

OFAT stands for **One Factor At a Time**. It describes an experimental approach in which a practitioner changes one input variable, or factor, while holding the remaining factors at specified conditions, then observes the resulting change in the output or response. In a Lean Six Sigma setting, a Belt may use this approach for a quick, simple investigation—for example, testing whether a single machine setting, material choice, or processing condition has an observable effect on a quality characteristic. The method can be useful as an initial learning exercise or when the process is sufficiently simple and the goal is to assess an individual factor's effect. Because OFAT varies a single factor per trial, its name directly reflects the way the experiment is conducted. Formal Design of Experiments methods are often used when a team needs to study several factors efficiently, but the term OFAT itself specifically means changing *one factor at a time*. See the NIST/SEMATECH e-Handbook discussion of one-factor-at-a-time experiments and the ASQ overview of Design of Experiments.

QUESTION NO: 28

Which of the following should be included in a data collection plan? (Choose two.)

A. A clear operational definition of what is being measured

B. The person responsible for collecting the data

C. The preferred solution to implement

D. The final validated project savings

E. A list of all possible root causes

ANSWER: A B

Explanation:

A clear operational definition of what is being measured and **the person responsible for collecting the data** are correct. A data collection plan documents how the team will obtain consistent, usable information for analysis. It should define the measure, the operational definition, the source of the data, the collection method, the timing or frequency, and the person responsible.

Without a common operational definition, different people may classify or record the same condition differently. Assigning responsibility also supports consistency and accountability. Proposed solutions and final project savings are not required elements of a data collection plan because the plan is used to gather facts before conclusions and improvements are finalized. See ASQ's data collection and analysis resource.

QUESTION NO: 29

The Cost of Poor Quality (COPQ) is comprised of which two of the following? (Choose two.)

A. Tangible (Visible) Costs

B. Input Costs

C. Production

D. Hidden Costs

ANSWER: A D

Explanation:

Cost of Poor Quality includes both **Tangible (Visible) Costs** and **Hidden Costs**. Tangible costs are the readily measured, recorded costs resulting from failures to meet requirements. In a process, these commonly include scrap, rework, repair, warranty claims, returns, complaint handling, and other internal or external failure expenses. They are visible because accounting systems or operational records can generally identify them directly.

Hidden costs represent the broader, less easily quantified consequences of poor quality. These may include lost sales, reduced customer loyalty, damage to reputation, lost productivity, delayed delivery, excess management time, and missed market opportunities. The familiar quality-cost “iceberg” concept emphasizes that visible failure costs may be only a small portion of the total loss created by poor quality; significant costs often remain below the surface because they are not separately captured in financial reports.

Lean Six Sigma practitioners consider both categories when estimating the improvement opportunity so that project benefits reflect the full business impact rather than only recorded scrap or rework. ASQ describes cost of quality as the costs associated with preventing, finding, and correcting defective work; failure-related costs are central to COPQ analysis. See ASQ’s Cost of Quality resource and iSixSigma’s COPQ overview.