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Six Sigma LSSWB

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QUESTION NO: 1

The Six Sigma concept redefines quality performance in terms of defects per million opportunities (dpmo).

A. True

B. False

ANSWER: A

Explanation:

True is correct. Six Sigma evaluates process quality through defects per million opportunities, commonly abbreviated as DPMO or DPMO. This measure goes beyond simply counting defective units because it considers the number of possible opportunities for a defect within each unit. For example, if a form has several required fields, each field can be treated as an opportunity for an error. Counting defects relative to all applicable opportunities enables meaningful comparison between processes that have different product volumes or levels of complexity.

In Six Sigma practice, a defect is a failure to meet a customer requirement or specification, while an opportunity is a measurable chance for such a failure to occur. The DPMO metric is calculated as the number of defects divided by the total number of defect opportunities, multiplied by one million. It is central to expressing process capability and linking measured performance with the familiar sigma-quality scale. At the commonly cited six-sigma performance level, a process corresponds to approximately 3.4 defects per million opportunities when using the conventional 1.5-sigma shift. The American Society for Quality describes Six Sigma as a method focused on reducing defects and variation: ASQ Six Sigma resources. A practical definition and DPMO calculation are also provided by iSixSigma's DPMO reference.

QUESTION NO: 2

The 5 Whys technique is used primarily to:

A. Establish the root cause of a problem.

B. Calculate defects per million opportunities.

C. Select a random sample from a lot.

D. Determine the project budget.

ANSWER: A

Explanation:

The 5 Whys technique is used primarily to identify the underlying cause of a problem by repeatedly asking why the problem occurred. Each answer is used as the basis for the next question, helping the team move beyond an immediate symptom toward a cause that can be addressed.

The number five is a guideline rather than a strict requirement. A team should continue only until it has reached a cause that is supported by facts and can be controlled or improved. The method is often used with other root-cause tools, such as process maps and cause-and-effect diagrams. See Lean Enterprise Institute's Five Whys resource.

QUESTION NO: 3

Which of the following is NOT an example of a common challenge of the Six Sigma Methodology within an organization?

A. lack of support

B. poor project execution

C. excess resources

D. lack of access to data

ANSWER: C

Explanation:

excess resources is the correct answer because Six Sigma deployment challenges are generally associated with constraints that prevent an organization from selecting, executing, and sustaining improvement projects. Effective Six Sigma work requires committed leadership, appropriately scoped projects, capable practitioners, reliable data, and time for teams to analyze processes and implement improvements. An abundance of resources is not normally characterized as an implementation barrier; rather, sufficient people, funding, analytical capability, and leadership attention can enable better project selection, stronger execution, and more sustainable control of improved processes. Organizations should still manage resources responsibly and align them to business priorities, but having resources available is fundamentally an enabler of improvement rather than a typical obstacle to adopting Six Sigma. This fits the methodology's emphasis on organizational commitment and providing the infrastructure needed for data-driven process improvement. The American Society for Quality describes Six Sigma as a disciplined approach using data and statistical analysis to improve processes, which depends on organizational support and capability: ASQ: Six Sigma. The U.S. National Institute of Standards and Technology also identifies leadership, workforce, operations, measurement, and results as interconnected elements of performance excellence: NIST Baldrige Excellence Framework.

QUESTION NO: 4

What is flowcharting in sigma belt?

A. It is a diagram, which displays the steps of a process.

B. It is a chart, which shows the total production rate of a process.

C. It is a chart of production in six Sigma.

D. It is a measuring process to measuring the average spread of data.

ANSWER: A

Explanation:

Flowcharting is a fundamental Lean Six Sigma process-mapping technique, so "It is a diagram, which displays the steps of a process." is correct. A flowchart visually represents the sequence of activities, decisions, inputs, outputs, and handoffs that make up a process or workflow. Standard symbols and directional arrows make the order of work visible and help a team develop a shared understanding of how the process actually operates.

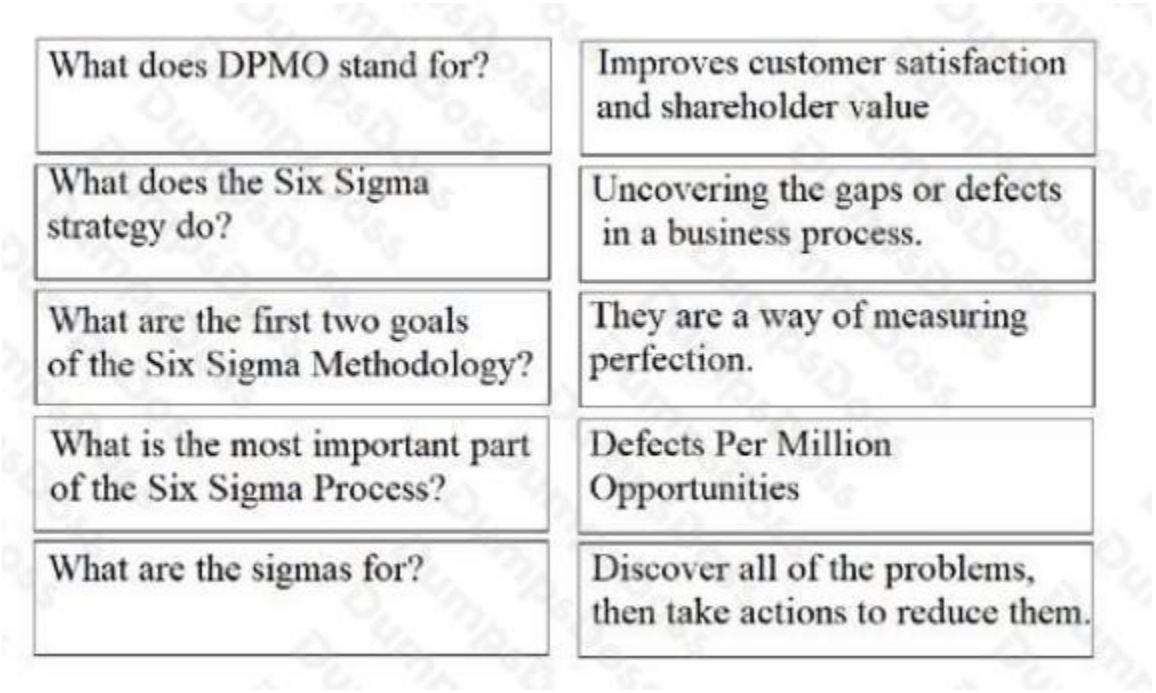
In a Six Sigma project, flowcharting is especially useful during the Define and Measure phases. The team can use it to establish process boundaries, identify the people or functions involved, clarify where data should be collected, and reveal potential sources of delay, rework, variation, or waste. The diagram can represent a high-level process or provide detailed documentation of individual process steps, depending on the project's needs. Creating the map collaboratively with people who perform the work helps ensure that it reflects the current-state process rather than an assumed or idealized version. The American Society for Quality describes a flowchart as a graphical representation of a process, and its process-mapping resources explain its use in analyzing and improving work processes. See ASQ: Flowchart and ASQ: Process Mapping.

QUESTION NO: 5 - (DRAG DROP)

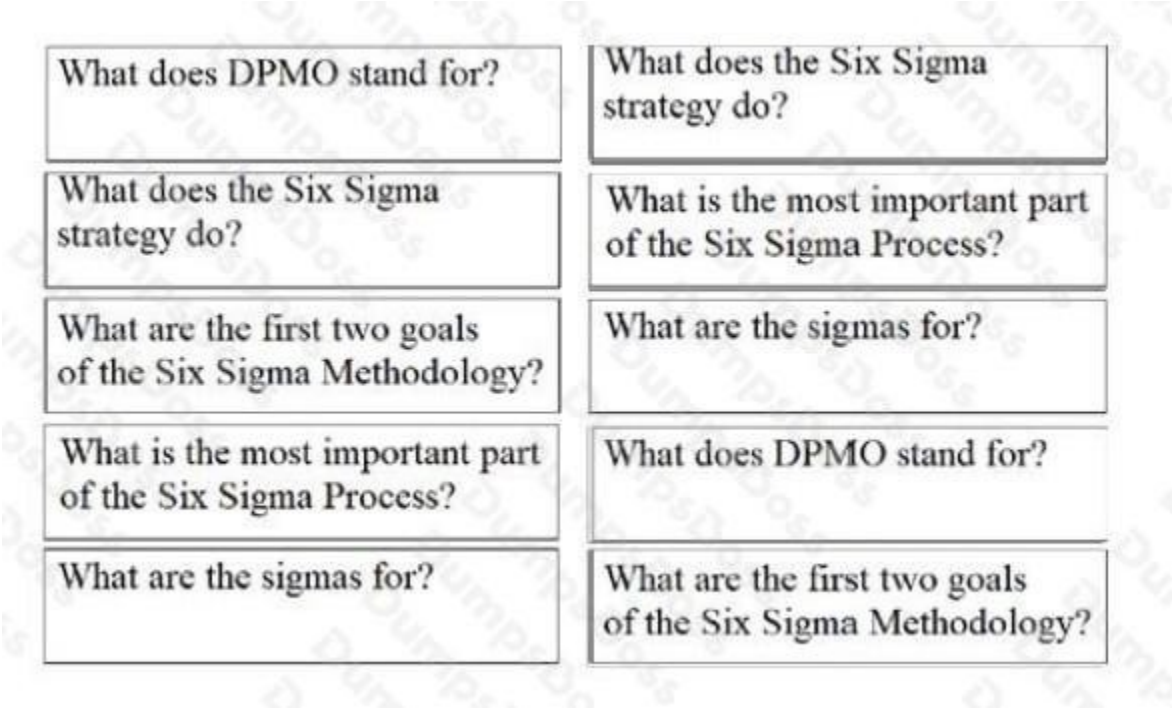
DRAG DROP

Match a notion with the definition.

Select and Place:



ANSWER:



Explanation:

Six Sigma is a customer-focused, data-driven improvement approach that connects process performance to business value. Its strategy is intended to improve customer satisfaction while also improving shareholder value, because reducing defects, delays, rework, and inconsistency helps an organization deliver more reliable outcomes at lower operating cost. The first practical goals of a Six Sigma effort are to discover the problems affecting the process and then take action to reduce them. This establishes the improvement cycle: identify where performance is breaking down, use evidence to understand the issue, and make changes that reduce the causes of poor performance.

The most important part of the Six Sigma process is uncovering the gaps or defects in a business process. Improvement cannot be targeted effectively until the team can see the difference between current process performance and the customer's required performance. Sigma levels are used as a way of measuring perfection, or more precisely, the capability of a process to produce outcomes with very few defects. DPMO is the standard abbreviation for Defects Per Million Opportunities, a normalized metric that allows defect performance to be expressed relative to the number of opportunities for a defect. The American Society for Quality's Six Sigma overview describes Six Sigma as a method for improving business

processes through defect reduction, and its DPMO reference defines the metric used to quantify defects per million opportunities.

QUESTION NO: 6

It is advocated in Six Sigma that design features and characteristics be dominated by engineering considerations rather than by customer requirements.

A. True

B. False

ANSWER: B

Explanation:

False is correct because Six Sigma begins with the voice of the customer: understanding what customers need, value, and consider critical to quality. Product or process design features should be selected and prioritized to meet those customer-driven requirements. Engineering expertise remains essential in translating customer needs into feasible, reliable, safe, and cost-effective technical specifications, but it is not intended to override the customer requirements that define value.

In practice, teams commonly use tools such as Voice of the Customer analysis and Critical-to-Quality requirements to convert customer expectations into measurable design characteristics. This customer-focused approach helps ensure that improvement and design work addresses the outcomes that matter to users, rather than optimizing technical features with little customer value. ASQ describes Six Sigma as a customer-focused, data-driven methodology for reducing defects and improving performance. The customer-focus principle is also central to quality-management guidance, which emphasizes meeting customer requirements and enhancing customer satisfaction. See ASQ's Six Sigma overview and ISO 9000 quality-management principles.

QUESTION NO: 7

What do you understand by cellular manufacturing in six sigma?

A. Manufacturing product over requirement is called cellular manufacturing.

B. Organizing equipment and workstations into a cell to process a family of similar products in a smooth flow is called cellular manufacturing.

C. Failure of an approved manufacturing process.
None of the above.

ANSWER: B

Explanation:

Cellular manufacturing is a Lean method commonly used alongside Six Sigma improvement work to improve flow, reduce waste, and shorten lead time. It organizes the equipment, people, and work steps needed to produce a family of similar products or perform a related set of operations into a compact work cell. The cell is typically arranged in the sequence of processing steps, often in a U-shaped layout, so that work can move smoothly from one operation to the next with minimal transportation, waiting, handoffs, and work-in-process inventory. Rather than treating a cell as merely a small portion of a larger manufacturing task, its defining feature is the deliberate grouping of resources around a product family to support efficient, flexible, near-continuous flow. This structure also makes abnormalities more visible and can enable operators to perform multiple steps as demand requires. In Lean Six Sigma, teams may use cellular manufacturing after analyzing process flow and demand, then measure the resulting effects on cycle time, defects, throughput, and inventory. The definition aligns with the Lean concept of arranging operations into cells for product families, as described by Lean Enterprise Institute and ASQ's Lean resources.

QUESTION NO: 8

Which of the following is NOT considered continuous data?

A. The number of people in a stadium

B. Temperature

C. Time spent waiting in a waiting room

D. Birth weights

ANSWER: A

Explanation:

The number of people in a stadium is not continuous data because it is a count. Counts take distinct, whole-number values: there can be 10,000 or 10,001 people present, but not a fractional person. In Lean Six Sigma terms, this makes it discrete (or attribute) data. Discrete data arise from counting occurrences, items, or units and are commonly used for measures such as defect counts, customer counts, and number of transactions.

Continuous data, by contrast, are measurements that can theoretically take any value within an interval, subject to the precision of the measuring system. A measurement may be recorded to a limited number of decimal places, but the underlying characteristic can vary along a scale. Correctly distinguishing count data from measurement data is important during the Measure phase because it guides how teams summarize process performance, select graphs, and choose appropriate analytical methods. The National Institute of Standards and Technology describes continuous data as data measured on a continuum and discrete data as data obtained by counting. See the NIST Engineering Statistics Handbook discussion of data types and its guidance on discrete distributions.

QUESTION NO: 9

Which of the following is true about Simple Random Sampling?

A. Simple random sampling is a method of choosing samples randomly from an infinite population.

B. This is the process of sampling, which includes collecting various samples randomly from one or more groups.

C. In this process a company gives a random sample of its production for being approved as a sample.

D. None of the above.

E. Simple random sampling selects units from a defined population so that every possible sample of a given size has an equal chance of selection.

ANSWER: E

Explanation:

Simple random sampling selects units from a defined population in such a way that every possible sample of a specified size has the same probability of being selected. This equal-probability principle is the essential feature of the method. For example, if a process team has a complete list of 500 transactions and needs 25 for review, it can assign each transaction an identifier and use a random-number generator to select 25 unique identifiers. The resulting sample supports unbiased estimation because the selection mechanism does not deliberately favor particular shifts, products, operators, dates, or transaction types. In Lean Six Sigma work, simple random sampling is useful when the population can be identified and a representative, impartial set of observations is needed for baseline measurement, process analysis, or verification. A sampling frame—a usable list of the population members—is therefore an important practical requirement. The National Institute of Standards and Technology describes simple random sampling as a method in which every item has an equal probability of selection, while ASQ highlights random sampling as a means of obtaining data that can represent the population. See NIST's discussion of simple random sampling and ASQ's sampling resource.

QUESTION NO: 10

Why Pareto chart is important in six sigma?

A. It gives the appropriate figures of employee's performances.

B. It identifies the most significant problem categories that should receive priority focus.

C. It provides the company production rate variations.

D. None of the above.

ANSWER: B

Explanation:

A Pareto chart is important because it helps a Six Sigma team prioritize improvement work by displaying categories of defects, errors, causes, or other problems in descending order of frequency, cost, or impact. This visual ranking makes the "vital few" contributors stand out from the less significant contributors, enabling the team to focus limited time and resources where they are most likely to improve customer outcomes and process performance.

In the Define and Measure phases of DMAIC, teams commonly use Pareto charts to summarize collected data and select a high-impact problem category for deeper analysis. The chart may also include a cumulative-percentage line, which helps show how much of the total problem is accounted for as categories are added. Although the familiar 80/20 pattern is a useful heuristic rather than a universal rule, the core value is evidence-based prioritization. By identifying the causes or categories that merit priority attention, the team can proceed to root-cause analysis and targeted corrective action. See the American Society for Quality's Pareto chart overview and the NIST Pareto chart resource.

QUESTION NO: 11

While withdrawing money at the ATM, the customer enters the amount to be withdrawn on the ATM keypad? What type of activity is this?

A. Waste

B. Value Adding

C. Non-Value adding

D. Defect

ANSWER: B

Explanation:

Value Adding is correct because entering the requested withdrawal amount directly specifies the service that the customer wants the ATM to perform. The entry determines the amount of cash to be dispensed and is an essential part of delivering the intended transaction accurately. From the customer's perspective, selecting the amount is integral to obtaining cash in the desired value; it creates the specific service outcome rather than being an incidental internal step.

In Lean Six Sigma, value is assessed from the customer's viewpoint: an activity is value adding when it contributes directly to the product or service the customer is seeking and is performed correctly. For an ATM withdrawal, the customer's amount selection provides the information needed to tailor the transaction to that customer's request. This supports a correct-first-time, customer-defined service outcome. Lean practice focuses on identifying such customer-value activities so that process effort can be concentrated on reliably delivering them. The Lean Enterprise Institute's overview of Lean describes the central role of defining value from the customer's perspective, and ASQ's Lean resource discusses Lean's focus on value and process improvement.

QUESTION NO: 12

Technical requirements need to be determined to build the House of Quality.

A. True

B. False

ANSWER: A

Explanation:

True is correct. The House of Quality is the principal matrix used in Quality Function Deployment to translate the voice of the customer into measurable, actionable technical requirements. Building it begins with identifying customer needs, often called the “whats,” and then determining the engineering or process characteristics that can deliver those needs, often called the “hows.” These technical requirements must be specific enough to support design decisions, target setting, prioritization, and later verification.

Once the requirements are defined, the team evaluates the relationships between customer needs and the technical characteristics. This allows the organization to see which technical features have the greatest effect on customer value. The House of Quality also supports comparison with competitive performance, assessment of correlations or trade-offs among technical characteristics, and assignment of technical priorities. Therefore, determining the technical requirements is essential rather than optional: without them, customer expectations cannot be systematically translated into design and operational specifications. This use of a structured customer-to-technical translation is a core purpose of Quality Function Deployment and the House of Quality. See the ASQ overview of Quality Function Deployment and the iSixSigma QFD reference.

QUESTION NO: 13

Which phase of the DMAIC methodology establishes the project problem, goals, customers, and scope?

A. Define

B. Measure

C. Analyze

D. Control

ANSWER: A

Explanation:

Define is correct. The Define phase starts a DMAIC project by clarifying the business problem, customer impact, project objective, boundaries, stakeholders, and expected benefits. A project charter is commonly used to document this information and create agreement before detailed data collection begins.

The remaining DMAIC phases build on this definition: Measure establishes current performance, Analyze identifies causes, Improve implements solutions, and Control sustains the gains. See ASQ’s DMAIC resource.

QUESTION NO: 14

Which of the following is a type of waste - as per Lean framework?

A. Defects

B. Waiting

C. Over-processing

D. All the items herein

ANSWER: D

Explanation:

All the items herein is correct because defects, waiting, and over-processing are each recognized forms of waste in Lean practice. Lean seeks to maximize customer value by identifying and eliminating activities that consume resources without

adding value. Defects create waste through errors, rework, correction, inspection, and possible customer dissatisfaction. Waiting is nonproductive idle time, such as delays for information, approvals, materials, equipment, or the completion of an earlier process step. Over-processing occurs when work, features, reviews, precision, or processing steps exceed what the customer requires or what is necessary to produce the intended outcome. These categories are commonly included in the traditional seven wastes, often remembered with the TIMWOOD mnemonic; many organizations also recognize an eighth waste involving unused employee skills, knowledge, and creativity. Recognizing these wastes enables teams to observe process performance, target improvement opportunities, simplify work, and improve flow. The Lean Enterprise Institute provides an overview of Lean thinking and its focus on value and waste elimination at https://www.lean.org/explore-lean/what-is-lean/. ASQ also describes Lean as an approach focused on reducing waste and improving process efficiency at https://asq.org/quality-resources/lean.

QUESTION NO: 15

The statistical difference between a process operating at a 5 sigma level and a process operating at a 6 sigma level is markedly different when it comes to the number of defects present.

A. True

B. False

ANSWER: A

Explanation:

True is correct. Sigma level expresses process capability relative to specification limits: as the sigma level rises, the probability that an output falls outside those limits declines dramatically rather than by a small linear amount. Using the commonly taught Six Sigma long-term convention, which incorporates a 1.5-sigma shift, a process operating at five sigma produces about 233 defects per million opportunities, whereas a six-sigma process produces about 3.4 defects per million opportunities. This means moving from five sigma to six sigma reduces expected defects by roughly 229.6 per million opportunities—an approximately 98.5% reduction in defect rate. The difference is therefore operationally and statistically substantial, even though the numerical change in the sigma score is only one level. This illustrates why Six Sigma improvement efforts focus on reducing variation and centering the process on its target: small changes in capability at the high-performance end of the scale can yield very large improvements in quality, reliability, rework, and customer experience. See the American Society for Quality overview of Six Sigma and the NIST discussion of Six Sigma methodology.

QUESTION NO: 16

Which of the following is used to select the process of sampling plan?

A. DODGE ROMIG Table.

B. AOQL ANSI Table.

C. ATI & LTPD Measures.

D. None of the above.

ANSWER: A

Explanation:

DODGE ROMIG Table. is correct because Dodge-Romig sampling tables are a recognized method for selecting acceptance-sampling plans for lot inspection. They provide plan-selection procedures that specify the sample size and acceptance/rejection criteria needed to make a disposition decision about a submitted lot. These tables were developed for rectifying inspection, meaning that rejected lots are subjected to screening or corrective inspection so that outgoing quality is controlled. Depending on the inspection objective, a practitioner selects a Dodge-Romig plan using measures such as the Average Outgoing Quality Limit (AOQL), which limits the long-run average defect level leaving the inspection process, or the Lot Tolerance Percent Defective (LTPD), which represents a poor-quality level that should have a low probability of acceptance. Thus, the tables convert quality-protection requirements and lot information into a practical sampling plan rather than merely stating individual quality measures. NIST describes Dodge-Romig plans and their use for AOQL-based and

LTPD-based acceptance sampling in its Acceptance Sampling handbook section. Additional context on acceptance sampling and the role of sampling plans is available from ASQ's Acceptance Sampling resource.

QUESTION NO: 17

What is the ultimate objective of the Change Management process? → To create a six sigma organization whose processes and systems are as close to perfect as possible; 3.4 DPMO or Six Sigma.

A. True

B. False

ANSWER: B

Explanation:

False is correct. Change management is the disciplined approach used to prepare, equip, and support people as an organization moves from a current state to a desired future state. Its ultimate purpose is successful adoption and sustained use of a change so that the intended business benefits can be realized. In a Lean Six Sigma setting, this includes engaging affected stakeholders, communicating the reason for the change, addressing resistance, providing needed training, and reinforcing the new ways of working after process improvements are introduced.

A performance level of 3.4 defects per million opportunities is the conventional statistical benchmark associated with Six Sigma capability; it is not the universal objective of the change-management process itself. Change management can be applied to many types of organizational change, including improvements that do not seek or require a Six Sigma defect level. The essential outcome is that people adopt the changed process or system effectively and that the improvement is sustained. Prosci describes change management as the process and set of tools for managing the people side of change, while ASQ explains the 3.4-DPMO benchmark in its overview of Six Sigma. See Prosci: What is change management? and ASQ: Six Sigma.

QUESTION NO: 18

3.4 defects per million opportunities can occur with a quality level of 5 sigma but with a smaller mean shift than 1.5 times the standard deviation.

A. True

B. False

ANSWER: A

Explanation:

True is correct. The widely used 3.4 defects-per-million-opportunities figure corresponds to a one-sided normal-distribution tail at approximately 4.5 standard deviations from the relevant specification limit. Sigma quality and mean shift work together: the effective distance to the nearest specification limit is the stated process sigma level minus the assumed mean shift, expressed in standard-deviation units. Therefore, a process described as operating at 5 sigma with a 0.5-sigma mean shift has an effective performance level of 4.5 sigma (5 − 0.5 = 4.5). The one-sided probability beyond 4.5 sigma is about 3.4 parts per million, or 3.4 DPMO when each opportunity is treated consistently. A 0.5-sigma shift is smaller than the conventional 1.5-sigma shift often used in Six Sigma reporting. This illustrates that 3.4 DPMO is not intrinsically tied to only one nominal sigma level; it depends on both the baseline sigma capability and the shift assumption. The conventional "6 sigma with a 1.5-sigma shift" and "5 sigma with a 0.5-sigma shift" can both yield the same effective 4.5-sigma distance and corresponding tail rate. See the NIST process capability guidance and ASQ's Six Sigma overview.

QUESTION NO: 19

Six Sigma should be focused on:

A. Customer Satisfaction

B. Government Satisfaction

C. Employee Satisfaction

D. Supplier Satisfaction

ANSWER: A

Explanation:

Customer Satisfaction is correct because Six Sigma is fundamentally a customer-focused improvement methodology. It seeks to understand the voice of the customer, translate customer needs into measurable critical-to-quality requirements, and improve processes so that outputs consistently meet those requirements. In practice, project selection and performance measures should connect process improvement to customer value, such as improved quality, reliability, timeliness, or service experience. By reducing defects and variation in processes that matter to customers, organizations improve the likelihood that products and services will satisfy customer expectations.

This focus is reflected in the ASQ description of Six Sigma, which characterizes it as a disciplined, data-driven approach for eliminating defects and improving quality. Customer requirements provide the essential definition of quality and the basis for determining which process characteristics require control and improvement. The customer-oriented perspective also ensures that teams do not merely optimize internal metrics; they prioritize measurable outcomes that create value for the people receiving the product or service. See the American Society for Quality's Six Sigma overview and ASQ's Voice of the Customer guidance.