



The Lean Six Sigma Yellow Belt Examination

Rationale

1 U10132 - World Class Performance

C

Recall that Lean philosophy and principles realize improvements in process lead times and efficiencies.

- a) Incorrect: This is not a principle of Lean. Ref: 1.3.2
- b) Incorrect: This is not a principle of Lean. Ref: 1.3.2
- c) Correct: A principle of Lean is to 'Identify the value stream and eliminate waste, defects or mistakes in everything a company does. Ref: 1.3.2
- d) Incorrect: This is not a principle of Lean: 1.3.2

2 U50221 - Level II – Creating a Continuous Improvement Culture

A

Understand the purpose and use of data visualization, analysis and communication.

- a) Correct: Visualization of data has two key purposes. The first is to help us in graphical data analysis to develop hypotheses regarding trends, groups and correlations within the data. These hypotheses can then lead to further data collection and testing with a view to drawing a statistically valid conclusion. The second use of visualization of data is then used to communicate findings and conclusions to others. Ref: 5.2.1
- b) Incorrect: This is about the Kaizen principle. Better to be 80% right today than 100% right in six months. Ref: 5.1.4
- c) Incorrect: This is the purpose of the 'Root Cause Analysis' (RCA) method of problem solving. Ref: 5.1.3
- d) Incorrect: This is the purpose of brainstorming. Ref: 5.3

3 U30241 - Project Management

C

Interpret problem statements in relation to customer requirements.

- a) Incorrect: A problem statement does not identify the 'scope of the project'. See Rationale C. Ref: 3.4.1
- b) Incorrect: A problem statement does not identify the 'members of an improvement team. See Rationale C Ref: 3.4.1
- c) Correct: A problem statement should be 'SMART' and include a precise statement of the problem and goal, and whether it is urgent or has an impact on the organization. Ref: 3.4.1
- d) Incorrect: The gap between current delivery performance and the target delivery performance is used to project the target benefits. Ref: 3.4.4

4 U60263 - Level III – Creating Stable and Efficient Processes

B

Understand the concept of Single Minute Exchange of Die (SMED) to reduce changeover time.

- a) Incorrect: Kaizen focuses on improvements at the workplace of an organization. It is based on a continuous process of small improvement steps, visible to create a constant feeling of success. Ref: 1.4.1
- b) Correct: SMED is an analytical method with the objective to reduce materials, skilled resources and time necessary to set-up equipment to produce a different product. (A 'Die' is a tool used in manufacturing). Ref: 6.6.3
- c) Incorrect: Six Sigma focuses on capability and reducing variation. Recognizing a link between fewer defects and lower costs. Ref: 1.2.1
- d) Incorrect: Value Stream Mapping is a powerful tool in describing and establishing processes in an efficient manner by the identification and elimination of Waste in the process. Ref: 1.4.1

5 U50211 - Level II – Creating a Continuous Improvement Culture

B

Participate in Short Interval Management (SIM), Stand Up meetings and corrective actions.

- a) Incorrect: See Rationale B.
- b) Correct: The key purpose of Short Interval Management (SIM) is that it leads to appropriate and timely action. Ref: 5.1.1
- c) Incorrect: SIPOC (Suppliers, Inputs, Process, Outputs and Customers) analysis is the tool used to draw a high level visualization of the process steps. Ref: 6.3
- d) Incorrect: Critical to Quality (CTQ) Flowdown allows you to understand and prioritize customer requirements. Ref: 7.1.2

6 U40211 - Level I – Creating a Solid Foundation

A

Understand how organizing the work environment, by applying 5S (Sort, Straighten, Shine, Standardize, Sustain), will improve safety and moral.

- a) Correct: This step involves setting standards for cleaning and rules. To improve safety, fire extinguishers, first aid kits and exits should be marked clearly. Also standards should be defined for operator clothing like wearing safety glasses, hand gloves, sound protection, and protective footwear. Ref: 4.1.1
- b) Incorrect: This step is about keeping everything clean and orderly. Ref: 4.1.1
- c) Incorrect: This final step is about sustaining all previous steps and actions. Without this step everything will revert to the original situation within a short space of time, untidy and potentially unsafe. Ref: 4.1.1
- d) Incorrect: This objective of this step is to identify a permanent location for each item. Ref: 4.1.1

7 U60212 - Level III – Creating Stable and Efficient Processes

D

Participate in identifying input and output process variables and be familiar with SIPOC technique.

- a) Incorrect: Customers of the process are those who the process affect or benefit. Ref: 6.1.2
- b) Incorrect: Measures of the process critical to quality are outputs. Ref: 6.1.2
- c) Incorrect: Individuals or teams that provide inputs to a process are Suppliers. Ref: 6.1.2
- d) Correct: Inputs are those things needed to execute a process and deliver the outputs. Ref: 6.1.2

8 U70111 - Level IV – Creating Capable Processes

D

Recall that critical characteristics are called Critical to Quality (CTQ) and that they have to be translated to internal process targets.

- a) Incorrect: Supplier measures are typically inputs to the process and cannot be decided until the output measure has been decided.
- b) Incorrect: Input measures cannot be decided until the output measure has been decided.
- c) Incorrect: Process measures cannot be decided until the output measure has been decided.
- d) Correct: We start with the end in mind and consider the expected output in terms of customer requirements. What are the CTQ factors, measurable specifications of the requirement? Ref 7.1.1

9 U70232 - Level IV – Creating Capable Processes

C

Understand the difference between special cause and common cause variation.

- a) Incorrect: Common cause variation is caused by the process itself. Every process has some amount of fluctuation caused by unknown factors, resulting in a steady but random distribution of output around the average of data. Ref: 7.3.2
- b) Incorrect: Special cause variation is also called exceptional or assignable. This is the opposite of that and therefore incorrect. Ref: 7.3.2
- c) Correct: Special cause variation is caused by factors that result in a non-random distribution of output. Special cause variation is a shift or sudden change in output, caused by a specific factor such as environmental conditions, or process input parameters. Ref: 7.3.2
- d) Incorrect: Natural variation is also called common cause variation and is caused by the process itself. Ref: 7.3.2

10 U60123 - Level III – Creating Stable and Efficient Processes

C

Recall the different types of data and that there is a difference between counting and measuring.

- a) Incorrect: This is not a type of data. It is a measurement scale. An ordinal measurement scale is used to differentiate between items that can be placed in distinct categories and where the categories have an inherent order or relationship. Ref: 6.2.3
- b) Incorrect: This is not a type of data. There are two types of data, qualitative and quantitative. Qualitative data can be divided into discrete and continuous data. Ref: 6.2.3
- c) Correct: Qualitative data can be divided into discrete and continuous data. Continuous data are measured on a continuously variable scale, i.e. one that is infinitely divisible, and are sometimes called 'variable data'. Examples of continuous data are: dimensions, time, currency, weight and resistance and are expressed as any real number. Ref: 6.2.3
- d) Incorrect: This is not a type of data. There are two types of data, qualitative and quantitative. Qualitative data can be divided into discrete and continuous data. Ref: 6.2.3

11 U70191 - Level IV – Creating Capable Processes

D

Recall the importance of efficient ways of experimenting.

- a) Incorrect: See Rationale D.
- b) Incorrect: See Rationale D.
- c) Incorrect: See Rationale D.
- d) Correct: OFAT does not reveal interactions between factors. Ref: 7.9.1

12 U60251 - Level III – Creating Stable and Efficient Processes

A

Understand the meaning of Flow.

- a) Correct: The implementation of Flow improves Lead Time and profit. Ref: 6.5.1
- b) Incorrect: See Rationale A.
- c) Incorrect: See Rationale A.
- d) Incorrect: See Rationale A.

13 U70231 - Level IV – Creating Capable Processes

B

Understand the basic terms of statistics e.g. the mean, median, standard deviation and range.

- a) Incorrect. The 'Mean' is the sum of the values divided by the number of values. Ref: 7.3.1
- b) Correct: The 'Range' is the absolute difference between the maximum and minimum value in a data set. Ref: 7.3.1
- c) Incorrect. The 'Variance' is the average of the squared deviations from a value. Ref: 7.3.1
- d) Incorrect. The 'Mode' is the most common value in a data set. Ref: 7.3.1

14 U50222 - Level II – Creating a Continuous Improvement Culture

D

Understand basic quality tools: Check sheet, Pareto chart, Scatter Plot, Bar chart, Pie chart, Time Series Plot, Histogram and Box Plot.

- a) Incorrect: The purpose of the Ishikawa diagram is to collect possible causes for a certain effect by conducting a brainstorming session. In most cases the effect is a failure mode or problem statement. Ref: 5.3.1
- b) Incorrect: The purpose of the Pareto chart is to highlight the single most important factor among a (typically large) set of factors. Ref: 5.2.2
- c) Incorrect: Histograms are used to divide sample values into a certain number of intervals. These intervals are called 'bins' and are represented by bars. Each bar represents the number of observations (or frequency) falling within one bin. Histograms are used to examine the shape and spread of data. Ref: 5.2.2
- d) Correct: Bar charts are used to visually compare category measures like quantities or frequencies for two or more groups. Ref: 5.2.2

15 U60232 - Level III – Creating Stable and Efficient Processes

C

Understand that Value Stream Mapping (VSM) is a technique for identifying Waste and Non- Value Added activities.

- a) Incorrect: Value stream Mapping is not used for this.
- b) Incorrect: Value Stream Mapping is not used for this.
- c) Correct: Value Stream Mapping (Current State) answers the questions, 'What sources of waste can be identified?', and 'Where can we implement continuous flow?' Ref: 6.3.2
- d) Incorrect: Value Stream Mapping is not used for this.

16 U10111 - World Class Performance

B

Recall that Operational Excellence can be applied to processes in different types of enterprises.

- a) Incorrect: This is not a focus of Operational Excellence. Ref: 1.1.1
- b) Correct: Operational Excellence involves focusing on the customer's needs, keeping the employees positive and empowered and continually improving the current activities in the workplace. Ref: 1.1.1
- c) Incorrect: This is not a focus of Operational Excellence. Ref: 1.1.1
- d) Incorrect: This is not a focus of Operational Excellence. Ref: 1.1.1

17 U70121 - Level IV – Creating Capable Processes

B

Recall the difference between Six Sigma process performance metrics e.g. PPM, DPMO, DPU and RTY. Recall the difference between a defect and a defective.

- a) Incorrect: It only takes one defect to create one defective product. A defective product can have one or multiple defects. Ref: 7.2.1
- b) Correct: A defective product can have one or multiple defects. Ref:7.2.1
- c) Incorrect: A defective product can have one or multiple defects. Ref: 7.2.1
- d) Incorrect: It only takes one defect to create one defective product. Ref: 7.2.1

18 U60211 - Level III – Creating Stable and Efficient Processes

D

Understand the importance of process mapping to visualize the flow of activities and decisions within a process.

- a) Incorrect: This not done in process mapping. Mapping the process is one of the steps within Value Stream Mapping. In addition flows of material and information are visualized. Also the amount of Work in Process (WIP), Cycle Times and waiting times are mapped. Ref: 6.3.2
- b) Incorrect: Cause and Effect Matrix is not a process-mapping tool, but it connects the process input variables to the process out variables. Ref: 5.3.2
- c) Incorrect: This is the purpose of the Failure Mode and Effect Analysis (FMEA). Ref: 6.8.1
- d) Correct: Charting the process in a visual representation will work like a map to guide the team in the process activities. Ref: 6.1.1

19 U40231 - Level I – Creating a Solid Foundation

A

Understand quality procedures, the need to be disciplined and to work according to procedures.

- a) Correct: Quality assurance is a way of preventing mistakes or defects in products and avoiding problems when delivering solutions or services to customers. Quality assurance is process oriented and focuses on defect prevention rather than defect identification. Ref: 4.3.1
- b) Incorrect: Quality inspections and approvals are applied to finished products to ensure only good quality products will be delivered to the customer. Ref: 4.3.1
- c) Incorrect: Quality control is product oriented and focuses on defect identification and detection. It is very often at the end of the line of the process. Ref: 4.3.1
- d) Incorrect: Quality inspections and approvals are applied to finished products to ensure only good quality products will be delivered to the customer. Ref: 4.3.1

20 U70251 - Level IV – Creating Capable Processes

D

Understand that there are different measurement methods for continuous and discrete data.

- a) Incorrect: (4) See Rationale D.
- b) Incorrect: (3) See Rationale D.
- c) Incorrect: (2) See Rationale D.
- d) Correct: (1) Discrete data can only be discrete values, for example the number of defects or the number of attributes, like counting. Continuous data are measured on a variable scale i.e. dimensions, time, currency, weight and resistance and are expressed as any real number. Ref: 6.2.3

21 U30132 - Project Management

B

Recall that different customers have different needs, expectations, requirements and desires.

- a) Incorrect: Customer surveys are a method for understanding customer requirements. Ref: 3.3.2
- b) Correct: The DMAIC roadmap offers a focused and structured approach to improve processes and solve problems in an organization
- c) Incorrect: Customer visits are a method for understanding customer requirements. Ref: 3.3.2
- d) Incorrect: Analysing complaints is a method for understanding customer requirements. Ref: 3.3.2

22 U60171 - Level III – Creating Stable and Efficient Processes

B

Recall the difference between current state and future state Value Stream Mapping.

- a) Incorrect: The outcome of optimal Value Stream design is called the 'Future State Value Stream Map'. Ref: 6.7.1
- b) Correct: The outcome of optimal Value Stream design is called the 'Future State Value Stream Map' the optimal logistical flow that can be used for the next 1-3 years. Ref: 6.7.1
- c) Incorrect: The outcome of optimal Value Stream design is called the 'Future State Value Stream Map'. Ref: 6.7.1
- d) Incorrect: The outcome of optimal Value Stream design is called the 'Future State Value Stream Map'. Ref: 6.7.1

23 U70223 - Level IV – Creating Capable Processes

B

Understand tools for collecting data such as data sheets and check sheets.

- a) Incorrect: A data sheet is used to capture numerical readings, measures or counts. Ref: 7.2.3
- b) Correct: A concentration diagram uses a picture or diagram of the product or document on which the location of defects/problems/damages are then marked by the observer. Ref: 7.2.3
- c) Incorrect: Check sheets are often used to collect data about defects or causes of defects. Possible causes are listed on a sheet and a tick is made for every occurrence. Ref: 7.2.3
- d) Incorrect: Questionnaires or surveys use carefully scripted questions with a discrete set of responses for respondents to choose from. Ref:7.2.3

24 U10121 - World Class Performance

C

Recall the origins of TQM, Lean and Six Sigma.

- a) Incorrect: Honda was not the company that developed the 'Lean thought process'. Ref: 1.2.1
- b) Incorrect: Mitsubishi was not the company that developed the 'Lean thought process'. Ref: 1.2.1
- c) Correct: Just after World War II (1950), Toyota started looking at ways to improve production and later developed the 'Lean thought process'. Ref: 1.2.1
- d) Incorrect: Subaru was not the company that developed the 'Lean thought process'. Ref: 1.2.1

25 U60261 - Level III – Creating Stable and Efficient Processes

D

Understand the meaning of Pull.

- a) Incorrect: (4) The 'Pull' principle is where the forecast-driven elements meet the demand-driven elements, reducing fluctuations. Ref: 6.6.1
- b) Incorrect: (3) The 'Pull' requires a 'Just In Time' (JIT) principle. Supplying each operation step in the process with the right part, at the right time, in the right amount. It requires detailed forecasting of demand and supply. Ref: 6.6.1
- c) Incorrect: (2) The 'Pull' requires balancing production to meet demand. Ref: 6.6.1
- d) Correct: (1) The 'Push' production will result in excessive quantities of raw materials and excessive semi-finished products. Ref: 6.6.1

26 U50231 - Level II – Creating a Continuous Improvement Culture

B

Understand brainstorm techniques: affinity diagram, 5-Why's and Ishikawa.

- a) Incorrect: (4) Cause and Effect Diagrams are common brainstorm techniques. To facilitate the thinking process of the attendees, Ishikawa diagram determines six major groups of causes that are called the 6 Ms. Ref: 5.3.1
- b) Correct: (3) The 5S technique is not used as a brainstorm technique, but a technique that exposes waste and prevents it from reoccurring in the future. Ref: 4.1.14.1.
- c) Incorrect: (2) The Affinity Diagram is common brainstorming technique. This is done by clustering items that are similar or can be combined in a certain way. Ref: 5.3.1
- d) Incorrect: (1) The 5-Whys Method is a common brainstorm technique that has to answer three questions which are visualized in a Tree diagram. Ref: 5.3.1

27 U60281 - Level III – Creating Stable and Efficient Processes

B

Understand the purpose and elements of a Failure Mode and Effect Analysis (FMEA), including the Risk Priority Number (RPN) and describe FMEA results for processes.

- a) Incorrect: (4) 'Detection' is one of the 10 steps. How well can failures or causes be detected? The means or method by which a failure is detected and the time it may take. Ref: 6.8.1
- b) Correct: (3) The 'Potential Failure Mode' records potential failures. The principle is to identify failure modes before they occur. Ref: 6.8.1
- c) Incorrect: (2) 'Risk Priority Number' is one of the 10 steps. Multiply the Severity x Occurrence x Detection. Ref: 6.8.1
- d) Incorrect: (1) 'Severity' is one of the 10 steps, what is the severity of the effect of failure to the customer. Ref: 6.8.1

28 U20111 - Process Improvement Deployment

A

Recall that an organization's culture can influence the success of Lean Six Sigma deployment.

- a) Correct: Organizational culture is the behaviour of humans within an organization as well as the meaning that people attach to this behaviour. All these aspects comprise the organizational culture that affects the collective way of thinking and working by people in the organization and determine the standards and values of an organization. Ref: 2.1.1
- b) Incorrect: See Rationale A.
- c) Incorrect: See Rationale A.
- d) Incorrect: See Rationale A.

29 U60153 - Level III – Creating Stable and Efficient Processes

D

Recall the eight pillars of Total Productive Maintenance (TPM) and how it can be used for process improvement.

- a) Incorrect: Focused improvement is one of the eight pillars within TPM. Ref: 6.5.3
- b) Incorrect: Training and education is one of the eight pillars within TPM. Ref: 6.5.3
- c) Incorrect: Quality maintenance is one of the eight pillars within TPM. Ref: 6.5.3
- d) Correct: Emergency planning is not one of the eight pillars within TPM. Ref: 6.5.3

30 U50213 - Level II – Creating a Continuous Improvement Culture

D

Understand the issues involved in identifying a root cause. Understand problem-solving tools.

- a) Incorrect: See Rationale D.
- b) Incorrect: See Rationale D.
- c) Incorrect: See Rationale D.
- d) Correct: The 5-Whys is an iterative question-asking technique used to explore the Cause-and-Effect relationship underlying a particular problem. The primary goal is to determine the root cause of a defect or problem. Ref: 5.1.3/5.3.1

31 U50232 - Level II – Creating a Continuous Improvement Culture

B

Participate in decision making techniques e.g. Cause and Effect Matrix.

- a) Incorrect: Identifying and entering the output variables or effects (Key Process Output Variables – KPOV) is step 1 of the 6 process steps. Ref: 5.3.2
- b) Correct: Calculating the score for each Key Process Input Variables (KPIV) is step 6, and is the final step in the process. Ref: 5.3.2
- c) Incorrect: To Indicate the importance of each output for the customer or for the organization is step 3 of the 6 process steps. Ref: 5.3.2
- d) Incorrect: Identifying and entering the factors of influence or causes (Key Process Input Variables – KPIV) is step 4 of the 6 process steps. Ref: 5.3.2

32 U60182 - Level III – Creating Stable and Efficient Processes

D

Recall that a control plan contains elements to verify the process to assure product quality.

- a) Incorrect: (4) The Control plan is sometimes called an inspection plan and comprises all actions that should be performed to minimize or mitigate the potential failures as identified in the Failure Mode and Effect Analysis (FMEA). Ref: 6.8.2
- b) Incorrect: (3) The Control plan states who shall control what and how, how many and how often. This includes both product and process characteristics like equipment measures. Ref: 6.8.2
- c) Incorrect: (2) The Control plan states what needs to be done if a so-called 'Out of Control' situation is observed. Ref: 6.8.2
- d) Correct: (1) FMEA identifies what controls will be placed in the production process to catch any defects at various stages in the process. The Control plan provides more details on how the potential issues are checked. The FMEA and the Control plan are two completely different tools, but they are linked by the process and by the controls. Ref: 6.8.2

33 U70171 - Level IV – Creating Capable Processes

C

Recall the basic principles of correlation.

- a) Incorrect: 'No correlation' is one of the three types of correlation within a scatter diagram. Ref: 7.7.1
- b) Incorrect: 'Positive correlation' is one of the three types of correlation within a scatter diagram. Ref: 7.7.1
- c) Correct: The three types of correlation within a scatter diagram are 'No correlation', 'Positive correlation' and 'Negative correlation'. Ref: 7.7.1
- d) Incorrect: 'Negative correlation' is one of the three types of correlation within a scatter diagram. Ref: 7.7.1

34 U70222 - Level IV – Creating Capable Processes

B

Understand it is important to follow systematic data collection.

- a) Incorrect: This is not an important requirement of sampled data.
- b) Correct: When sampling data it is always important to achieve a representative sample which is an accurate, proportional depiction of the population under study. Ref: 7.2.2
- c) Incorrect: This is not an important requirement of sampled data.
- d) Incorrect: This is not an important requirement of sampled data.

35 U60242 - Level III – Creating Stable and Efficient Processes

D

Identify the 7 types of customer waste (Muda); Opportunity Loss, Delay, Unnecessary Movement, Duplication, Incorrect inventory, Unclear Communication and Errors.

- a) Incorrect: Delay on the part of customers waiting for service, for delivery, in queues, for response, not arriving as promised. The customer's time may seem free to the provider, but when custom is taken elsewhere the pain begins. Ref: 6.4.2
- b) Incorrect: Duplication would not be a likely cause of an end product not meeting the customer's expectations. Ref: 6.4.2
- c) Incorrect: Over production would not be a likely cause of an end product not meeting the customer's expectations. Ref: 6.4.2
- d) Correct: Unclear communication is the waste of seeking clarification, confusion over product or service use, wasting time finding a location that may result in misuse or duplication. Ref: 6.4.2

36 U70201 - Level IV – Creating Capable Processes

D

Understand the objectives and benefits of Statistical Process Control (SPC).

- a) Incorrect: Specification limits are set by the customer. Knowing whether the process meets customer demands is extremely important indeed, but specification limits do not belong on a Control chart. Ref 7.10.1
- b) Incorrect: Specification limits do not belong on a Control chart. If they are, the Control chart simply becomes an inspection tool and can no longer be considered a Control chart. Ref: 7.10.1
- c) Incorrect: See Rationale D.
- d) Correct: Special cause variation is variation that cannot be explained by common causes alone. Often this type of variation is very large when compared to common cause variation and is caused by problems that can be identified and often eliminated. Ref: 7.10.1

37 U10231 - World Class Performance

C

Understand the value of Lean and Six Sigma, its philosophy and goals.
Understand the relationship between Lean and Six Sigma.

- a) Incorrect: A strong foundation of improving customer value leads us to develop a thorough understanding of how improving customer values will aid the objectives of the organization. Ref: 1.3.1
- b) Incorrect: Creates a powerful win-win sense of purpose that helps guide every improvement decision made. Ref: 1.3.1
- c) Correct: A strong foundation of improving customer value leads us to develop a thorough understanding of how improving customer values will aid the objectives of the organization. Ref: 1.3.1
- d) Incorrect: A strong foundation of improving customer value leads us to develop a thorough understanding of how improving customer values will aid the objectives of the organization. Ref: 1.3.1

38 U60283 - Level III – Creating Stable and Efficient Processes

A

Understand that work has to be stopped when there is a quality problem. Identify opportunities to apply Poka Yoke to avoid quality problems.

- a) Correct: Jidoka is the principle that every person is authorized to stop the line when a quality problem occurs. Actually, it is each person's obligation to stop the line when a quality problem occurs Ref: 6.8.3
- b) Incorrect: Heijunka is the process of reducing unevenness and means 'Production leveling' or 'Production smoothing'. Ref: 6.6.2
- c) Incorrect: Takt time is used to produce to the rate of customer demand. It is the rhythm at which products are requested by customers (or market). Ref: 6.2.2
- d) Incorrect: Total Productive Maintenance is used to prevent equipment failures. Ref: 6.5.3

39 U70161 - Level IV – Creating Capable Processes

B

Recall the basic principles of hypothesis testing.

- a) Incorrect: Correlation Analysis studies the degree of correlation between two continuous variables. Ref: 7.7.1
- b) Correct: Hypothesis testing is used to investigate if a statement is true or false. Ref: 7.6.1
- c) Incorrect: Process capability is the potential of a process to produce products or services within the design specifications. Ref: 7.8.1
- d) Incorrect: The use of visualization of data is to communicate findings and conclusions to others. Ref: 5.2.1

40 U60221 - Level III – Creating Stable and Efficient Processes

A

Understand Little's law.

- a) Correct: Average Lead Time is calculated using the formula developed by Little (1954), also called 'Little's Law'. Average Lead Time = Work in Progress (number of units required)/Completion Rate (production capacity). Ref: 6.2.1
- b) Incorrect: See Rationale A.
- c) Incorrect: See Rationale A.
- d) Incorrect: See Rationale A.

41 U60241 - Level III – Creating Stable and Efficient Processes

A

Identify the 8 types of waste (Muda); Overproduction, Waiting, Transport, Over processing, Inventory, Movement, Defects, Unused expertise.

- a) Correct: A Non-Value Adding Activity is classed as 'Waste' or 'Muda', which should be eliminated. There are 8 types of waste: Over-production, waiting, transport, over-processing, inventory, movement, defects and unused expertise. Ref: 6.4.1
- b) Incorrect: See Rationale A.
- c) Incorrect: See Rationale A.
- d) Incorrect: See Rationale A.

42 U50214 - Level II – Creating a Continuous Improvement Culture

B

Participate in Kaizen events.

- a) Incorrect: A Kaizen event is typically for a small improvement project, like waste elimination and Cycle Time reduction. Ref: 5.1.4
- b) Correct: A Kaizen event is typically for a small improvement project, like waste elimination and Cycle Time reduction. Ref: 5.1.4
- c) Incorrect: A Kaizen event is typically for a small improvement project, like waste elimination and Cycle Time reduction. Ref: 5.1.4
- d) Incorrect: Kaizen is a bottom-up approach. Ref: 5.1.4

43 U30122 - Project Management

B

Recall the 'eight discipline problem solving processes' that are used to approach and resolve problems.

- a) Incorrect: This is step 3 in the A3-report approach. Ref: 3.2.1
- b) Correct: A typical step within the 8D methodology compared to other methods is Step 3, developing Interim Containment Actions (ICA). A short-term fix until the actual root cause can be eliminated. Ref: 3.2.2
- c) Incorrect: This is step 4 in the DMAIC 14 step roadmap. Ref: 3.2.3 d)
Incorrect. This is step 13 in the DMAIC 14 step roadmap. Ref: 3.2.3

44 U40221 - Level I – Creating a Solid Foundation

B

Understand that standardized tasks are the foundation for continuous improvement. Interpret standard operating procedures (SOPs) and one-point-lessons.

- a) Incorrect: See Rationale B.
- b) Correct: Standards defined in the Quality Management System (QMS) should be visible and attainable for everybody in the organization. For each operation step a 'standard operation procedure' is composed. The SOP documents the best practices to the current moment, but it can always be questioned and further improvement opportunities sought. Ref: 4.2.1
- c) Incorrect: See Rationale B.
- d) Incorrect: See Rationale B.

45 U30221 - Project Management

C

Understand the project management methods that are used on the shop floor for Kaizen initiatives e.g. PDCA, A3-report.

- a) Incorrect: Within the plan step we will identify a relevant issue, define the problem and establish the objectives. Ref: 3.2.1
- b) Incorrect: In this phase we will generate a solution and create an implementation plan. Ref: 3.2.1
- c) Correct: The plan will be presented to the department leader to get approval to execute the plan. The plan is executed in the Do step. Ref: 3.2.1
- d) Incorrect: The problem will be analyzed and possible causes will be determined. Ref: 3.2.1

46 U60231 - Level III – Creating Stable and Efficient Processes

B

Understand the differences between Value Added and Non-Value Added activities.

- a) Incorrect: See Rationale B.
- b) Correct: A Value Adding Activity must meet the following criteria: The customer is willing to pay for it; it must be done correctly the first time and the action must change the product or service in some way. If one of the criteria is not met, the activity is classified as a 'Non-Value Adding Activity'. Ref: 6.3.1
- c) Incorrect: See Rationale B.
- d) Incorrect: See Rationale B.

47 U70182 - Level IV – Creating Capable Processes

D

Recall there are various process capability indices e.g. Cp and Cpk.

- a) Incorrect: See Rationale D.
- b) Incorrect: See Rationale D.
- c) Incorrect: See Rationale D.
- d) Correct: The formula for calculating Process Capability is 'Upper Specification Limit' (USL), minus 'Lower Specification Limit' (LSL), divided by the Standard Deviation. Ref: 7.8.2

48 U50212 - Level II – Creating a Continuous Improvement Culture

C

Understand the elements of a Visual Workplace and how these can help to control the improved process.

- a) Incorrect: Real time information, clear instructions, expectations, warning signals, operating instructions and other critical operations knowledge help employees know what to do, when to do it, and how to do it. Ref: 5.1.2
- b) Incorrect: Visual Workplace helps operations to reduce Waste and to maintain improvements over a long time. Ref: 5.1.2
- c) Correct: A visual inspection is a quality control method. A Visual Workplace simply means to make everything visible. This is achieved by improving communication, reducing complexity and making abnormalities visible. Ref: 5.1.2
- d) Incorrect: The purpose of a Visual Workplace is that everything is self-explanatory. Information about progress, priorities and quality is visible at a glance. Ref: 5.1.2

49 U30111 - Project Management

C

Recall the Six Sigma levels of expertise: Master Black Belt, Black Belt, Green Belt, Orange Belt and Yellow Belt. Recall the various team roles and responsibilities: Deployment leader, Champion, Project leader, and Team member.

- a) Incorrect: The Master Black Belt is a process improvement expert. Ref: 3.1.1
- b) Incorrect: The Master Black Belt is a process improvement expert. Ref: 3.1.1
- c) Correct: The Master Black Belt is a process improvement expert. Ref: 3.1.1
- d) Incorrect: The Master Black Belt is a process improvement expert. Ref: 3.1.1

50 U60162 - Level III – Creating Stable and Efficient Processes

D

Recall the basic principles of Volume leveling and Type leveling.

- a) Incorrect: See Rationale D.
- b) Incorrect:
See Rationale
- c) Incorrect:
See Rationale
- d) Correct: Volume leveling means that organizations will operate at levels of long-term average demand, reducing the unevenness caused by fluctuations in customer demand. Ref: 6.6.2