GAQM
CLSSMBB-001
Lean Six Sigma Master Black Belt

Latest Version: 6.0

Question: 1

Which of the following best differentiates a special cause from a common cause in a process behavior chart?

A. Variation that is inherent to the process, appearing as a stable predictable pattern
B. A non-random variation that can be assigned to a specific source
C. Variation due to operator error only
D. Variation that improves the process only

Answer: B

Explanation:
A special cause is a variation that is non-random and can be traced to a specific, identifiable source outside the normal process, whereas common cause variation is inherent, stable, and predictable within the process.

Question: 2

Cpk=1.67 centered, but Ppk=1.33 after 6mo dat
a. Indicates:
A. 0.5σ drift
B. A&B
C. Normal
D. Instability

Answer: B

Explanation:
Ppk lower signals between-subgroup variation/drift ~0.5σ equiv.

Question: 3

Battery fab constraint variability σ=21%. LSS-TOC buffer/RL for σ=5%?

A. RL-optimized 1.3x + DOE
B. DOE
C. Buffer fixed
D. RL sim

Answer: D

Explanation:
RL min Var(σ)=5%, throughput +37%.

Question: 4

A Lean Six Sigma Master Black Belt is prioritizing solutions with the steps: score each solution on impact, effort, and risk, then multiply scores by corresponding weights. What best describes this technique?

A. Failure Modes and Effects Analysis
B. Pareto Chart Analysis
C. Weighted Multi-Criteria Decision Analysis
D. Root Cause Analysis

Answer: C

Explanation:
Assigning scores and weights to multiple criteria and calculating weighted sums is characteristic of Weighted Multi-Criteria Decision Analysis used in solutions prioritization.

Question: 5

Healthcare diagnostic scan times model 3-parameter Weibull (β=2.8, η=25 min, γ=3 min), R(40 min)=0.41 links to patient throughput <80%, $250,000 overtime. Estimate kurtosis and design Control phase EWMA for scan variability to throughput KPIs.

A. 2.8, limits based on Weibull quantiles for wait <15 min
B. 3.2, exponentially weighted charts on tech fatigue for 90% utilization
C. 5.0, adaptive thresholds for peak hour adjustments
D. 5.9, integration with ARIMA for forecasting bottlenecks

Answer: A

Explanation:
Weibull kurtosis = 6 + [Γ(1+1/β)]^4 / [Γ(1+2/β) - Γ^2(1+1/β)]^2 - 4Γ(1+1/β)^2 / [Γ(1+2/β) - Γ^2(1+1/β)], for β=2.8 . Leptokurtic tails exacerbate delays. Control EWMA with Weibullderived UCL/LCL detects shifts, maintaining variability <10%, lifting throughput to 90% and cutting $250,000 overtime via staffing optimizations.

Question: 6

Which of the following best describes the primary purpose of the project charter in Lean Six Sigma?

A. To serve as a formal agreement outlining team member responsibilities
B. To document the detailed process maps and control plans

C. To provide a high-level overview of project objectives, scope, and resources
D. To record the tactical steps for project execution

Answer: C

Explanation:
The project charter offers a high-level summary that defines objectives, scope, and resource commitments, guiding the team and aligning stakeholders throughout the project lifecycle.

Question: 7

Skewed left defect rates data: 0.1%, 0.2%, 0.5%, 1.0%, 5.0% (outlier). Team plots boxplot identifying 5.0% as outlier (>Q3+3IQR). MBB advises retain for dispersion calc using what advanced metric over IQR?

A. Gini mean difference
B. Bowley's skewness coefficient
C. Adjusted Boxplot (Tukey fence)
D. Coefficient of variation (CV)

Answer: A

Explanation:
Gini coefficient measures dispersion robust to outliers/skew via pairwise absolute differences/mean, ideal for rates. CV=sd/mean sensitive to skew. Bowley for asymmetry. Adjusted fences for ID only. Retain outlier if valid special cause; Gini ensures accurate Y variation for Poisson regression in Analyze.

Question: 8

New service platform: Methodology?

A. DFSS IDOV
B. DMAIC
C. Lean
D. PDCA

Answer: A

Explanation:
IDOV for service design optimization.

Question: 9

Which is a critical assumption underlying the validity of factorial experiment results?

A. Independence of experimental runs due to randomization
B. Homogeneity of experimental units across blocks
C. Zero interaction between factors
D. Equal sample size for each factor level

Answer: A

Explanation:
Independence of runs through randomization is fundamental to ensure unbiased, valid statistical inference.

Question: 10

In a logistics route optimization, multiple linear regression on delivery time (Y) vs. distance X1, traffic index X2, vehicle age X3 yields collinear X1-X2 (VIF=6.2). For robust Analyze conclusions:

A. Apply PCA to combine X1-X2 into principal component
B. Center X1 and X2 (subtract means) to reduce multicollinearity
C. Eliminate X2 based on higher p-value
D. Proceed ignoring VIF threshold

Answer: A

Explanation:
High VIF inflates SEs; PCA derives PC1 (80% variance from distance-traffic) as substitute predictor, refitting $\hat{Y}=20 + 1.1PC1 + 0.5X3$ with VIF<2 and comparable $R^2=0.85$, preserving causal insight without bias. This verifies combined route factors' impact, guiding Improve's GPS rerouting for 20% time savings, advanced technique for Analyze in correlated logistics data.

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