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Certified Six Sigma Black Belt

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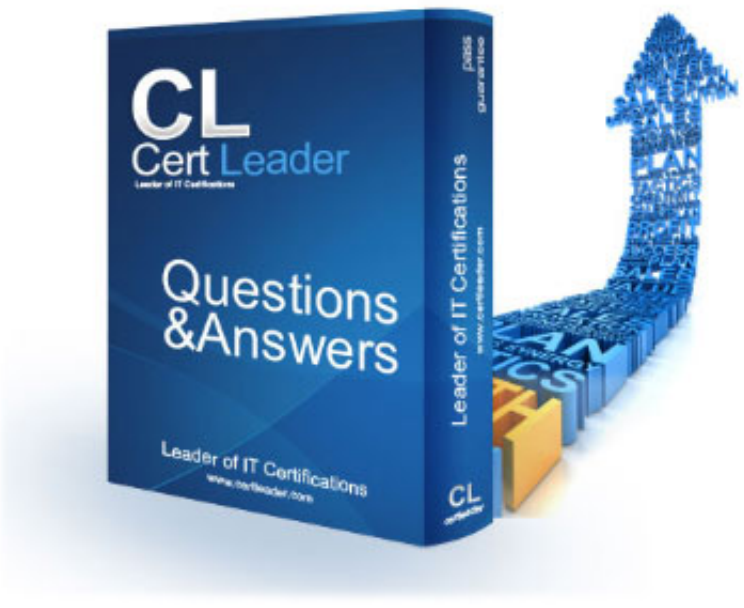


NEW QUESTION 1
- (Topic 1)
Calculate the interaction effect

Run #	A	B	Ave. Response
1	–	–	129
2	–	+	133
3	+	–	86
4	+	+	80

A. 1.5
B. 205
C. –5
D. 17
E. –17

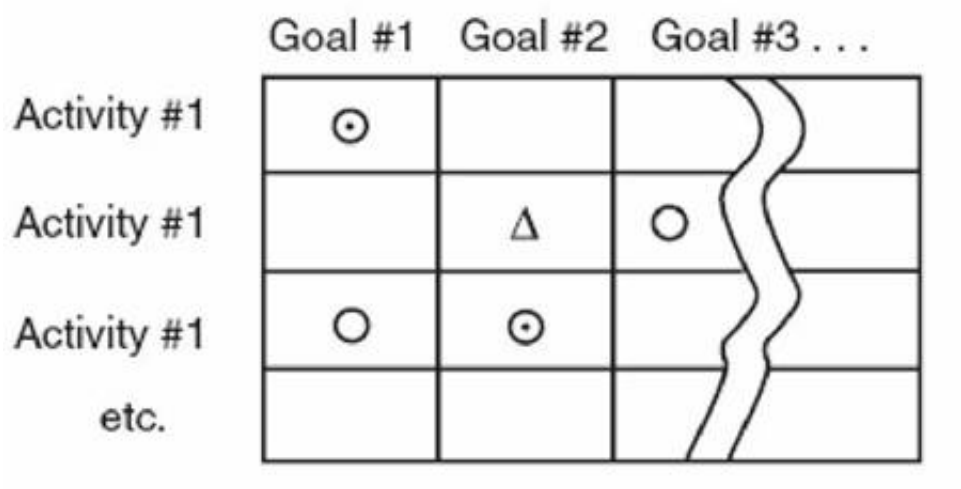
Answer: C

NEW QUESTION 2
- (Topic 1)
A higher resolution number for an experimental design indicates that:

A. results are more clear
B. confounding between main effects and interaction effects are less likely to be significant
C. a higher number of replications have been used
D. all factors have been tested at all levels
E. the design is more balanced

Answer: B

NEW QUESTION 3
- (Topic 1)
A management team lists nine goals across the top of a rectangle and 15 activity initiatives along the left hand side of the rectangle. If one of the activities strongly supports one of the goals a circle is placed in the box where that activity's row intersects the goal's column. If the activity's support is very strong a "bulls eye" is placed in the box and if the support is weak a triangle is used. This best describes which problem solving tool?



A. Affinity diagram
B. Inter-relationship digraph
C. Tree diagram
D. Process decision program chart
E. Matrix diagram
F. Prioritization matrix
G. Activity network diagram

Answer: E

NEW QUESTION 4
- (Topic 1)
A population of size 1,000,000 has mean 42 and standard deviation 6. Sixty random samples, each of size 15 are selected. According to the Central Limit Theorem the distribution of the sixty sample means has a standard deviation of approximately:

A. 6

B. 6/42
C. 6/15
D. 6/ 15
E. none of the above

Answer: D

NEW QUESTION 5
- (Topic 1)
George is an employee of Black, Inc. John is George's internal customer. Which statement is true?

A. John is employed by Black, Inc.
B. John is employed by another company that supplies material to Black, Inc.
C. John is employed by a company that purchases material from black, Inc.
D. John is employed by another company that has a fiduciary agreement with Black, Inc.
E. John is employed by another company as an internal auditor.

Answer: A

NEW QUESTION 6
- (Topic 1)
A random sample of 2500 printed brochures is found to have a total of three ink splotches. The rate of ink splotches in PPM is:

A. 1,000,000 ÷ 2500 × 3
B. 2500 ÷ 1,000,000 × 3
C. 3 ÷ 2500 × 1,000,000
D. 3 × 2500 ÷ 1,000,000

Answer: C

NEW QUESTION 7
- (Topic 1)
A team wants a technique for improving consistency of assembly operations. They should use:

A. written and diagrammed work instructions
B. flow charts and process maps
C. cause and effect diagrams
D. Pareto chart
E. relationship matrix

Answer: A

NEW QUESTION 8
- (Topic 1)
The following data were collected on the diameters of turned shafts: 2.506 2.508 2.505 2.505. These values are: I. Attribute data II. Discrete data III. Variables data IV. Continuous data

A. I and II A stable, normally distributed process with specification 3.50 .03 has = = .016. What percent of the production violates specification?
B. I only
C. II only
D. I and IV
E. III and IV

Answer: E

NEW QUESTION 9
- (Topic 1)
The quality leader responsible for the term Total Quality Management (TQM):

A. Juran
B. Ishikawa
C. Crosby
D. Feigenbaum
E. Taguchi
F. none of the above

Answer: D

NEW QUESTION 10
- (Topic 1)
A team wants a technique for determining and displaying priorities based on frequency of various defect types. They should use:

A. written and diagrammed work instructions
B. flow charts and process maps
C. cause and effect diagrams
D. Pareto chart
E. relationship matrix

Answer: D

NEW QUESTION 10
- (Topic 1)
An experiment has seven factors with two levels each. The experiment has eight runs. This experimental design is called:

A. full factorial design
B. half fractional factorial design
C. interaction
D. none of the above

Answer: D

NEW QUESTION 14
- (Topic 1)
Intuitively, which factor A or B seems most likely to be significant?

Run #	A	B	Ave. Response
1	–	–	129
2	–	+	133
3	+	–	86
4	+	+	80

A. A
B. B
C. C
D. neither
E. both about equally significant

Answer: A

NEW QUESTION 15
- (Topic 1)
Find the value of (7) in the ANOVA table. Assume:

$\alpha = 0.10$

ANOVA Table

Source	SS	df	MS	F ratio	F crit	P-value
x	1.48	1	(1)	(2)	(3)	(4)
Y	18.6	1	(5)	(6)	(7)	(8)
xxY	12.2	1	(9)	(10)	(11)	(12)
Error	2.1	4	(13)			

A. 16.4
B. 3.2
C. 18.6
D. 23.2
E. 4.54
F. 12.2
G. 0.525
H. 2.82
I. 1.48
J. 35.4
K. 0.10<P<1
L. 0.05<P<0.10
M. 0.01<P<0.05
N. 0.005<P<0.01
O. 0<P<0.005

Answer: E

NEW QUESTION 17
- (Topic 1)
An automatic gaging system is to be installed in a process. The gage will insert data values into a data base from which machine adjustments will be made automatically. A critical factor in specifying the equipment is:

A. communication link between gage and computer
B. compatibility of software in the gage and in the computer

C. adequate manual over-rides
D. all of the above

Answer: D

NEW QUESTION 19
- (Topic 1)
P(A) = .42, P(B) = .58, P(A&B) = .10. Are A and B (statistically) independent?

A. yes
B. no

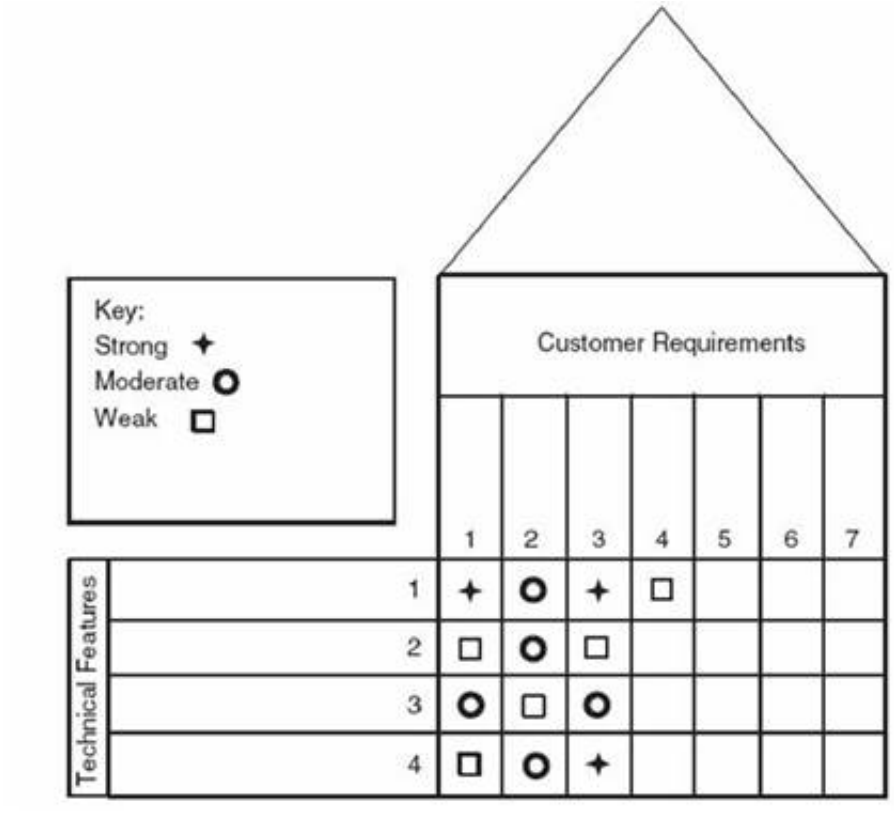
Answer: B

NEW QUESTION 22
- (Topic 1)
P(A) = .42, P(B) = .58, P(A&B) = .10 Find P(A or B).

A. .90
B. 1.00
C. .24
D. none of the above

Answer: A

NEW QUESTION 26
- (Topic 1)
Customer requirement #3 has a _____ relationship with technical feature #3.



A. strong
B. moderate
C. weak

Answer: B

NEW QUESTION 29
- (Topic 1)
The quality leader most associated with the concept of robustness:

A. Juran
B. Ishikawa
C. Crosby
D. Feigenbaum
E. Taguchi
F. none of the above

Answer: E

NEW QUESTION 34
- (Topic 1)
If DPU = 0.022, the RTU is approximately:

A. 0.022

B. 0.078
C. 0.0022
D. 0.98
E. 0.098
F. 0.0098

Answer: D

NEW QUESTION 38
- (Topic 1)
Find the value of (2) in the ANOVA table. Assume:

$\alpha = 0.10$

ANOVA Table

Source	SS	df	MS	F ratio	F crit	P-value
x	1.48	1	(1)	(2)	(3)	(4)
Y	18.6	1	(5)	(6)	(7)	(8)
xxY	12.2	1	(9)	(10)	(11)	(12)
Error	2.1	4	(13)			

A. 16.4
B. 3.2
C. 18.6
D. 23.2
E. 4.54
F. 12.2
G. 0.525
H. 2.82
I. 1.48
J. 35.4
K. 0.10<P<1
L. 0.05<P<0.10
M. 0.01<P<0.05
N. 0.005<P<0.01
O. 0<P<0.005

Answer: H

NEW QUESTION 41
- (Topic 1)
Find the value of (6) in the ANOVA table. Assume:

$\alpha = 0.10$

ANOVA Table

Source	SS	df	MS	F ratio	F crit	P-value
x	1.48	1	(1)	(2)	(3)	(4)
Y	18.6	1	(5)	(6)	(7)	(8)
xxY	12.2	1	(9)	(10)	(11)	(12)
Error	2.1	4	(13)			

A. 16.4
B. 3.2
C. 18.6
D. 23.2
E. 4.54
F. 12.2
G. 0.525
H. 2.82
I. 1.48
J. 35.4
K. 0.10<P<1
L. 0.05<P<0.10
M. 0.01<P<0.05
N. 0.005<P<0.01
O. 0<P<0.005

Answer: J

NEW QUESTION 46
- (Topic 1)
The operators of a manufacturing cell work out a more orderly arrangement for tool storage and establish a schedule to maintain cleanliness on a daily basis.

These improvements are best described by which approach to problem solving?

A. 5S
B. Poka yoke
C. Kaizen
D. PDCA
E. Re-engineering

Answer: A

NEW QUESTION 49
- (Topic 1)
Perform a risk analysis to determine the expected profit or (loss) from a project which has four possible disjoint outcomes: Outcome A shows a profit of $340,000 and has a probability of 0.25 Outcome B shows a profit of $120,000 and has a probability of 0.40 Outcome C shows a loss of $40,000 and has a probability of 0.10 Outcome D shows a profit of $100,000 and has a probability of 0.25

A. $130,000
B. $520,000
C. $154,000
D. ($168,000)
E. none of the above

Answer: C

NEW QUESTION 53
- (Topic 2)
Find Cp

A. 2.00
B. 0.56
C. 1.33
D. 0.44

Answer: B

NEW QUESTION 56
- (Topic 2)
What percent of population falls below the lower specification limits?

A. 9.18%
B. 22.66%
C. 6.68 %
D. 1.83%

Answer: A

NEW QUESTION 57
- (Topic 2)
Nominal Group Technique is used to:

A. help a group reach consensus
B. generate a group on new ideas
C. provide a consistent stable group leadership
D. provide a name for the group

Answer: A

NEW QUESTION 61
- (Topic 2)
An assembly line has 3 × 3 squares painted behind each person. Signs indicate the parts and quantities that should be placed there. This is an example of:

A. visual factory
B. kanban
C. poka-yoke
D. standard work
E. set up time reduction (SMED)

Answer: B

NEW QUESTION 63
- (Topic 2)
Find the upper control limit for a range chart if n = 4 and the average range is 2.282.

A. 2.282
B. 4.564
C. 5.208
D. 3.423

Answer: C

Explanation:

The following formula is for calculating upper control limit for a range chart n = 4

$$UCL_{\overline{R}} = D_4 \overline{R}$$

= 2.282 x 2.282 = 5.208
Use the following constants (D4) in the computation

n	D_4	n	D_4	n	D_4
2	3.267	7	1.924	12	1.717
3	2.574	8	1.864	13	1.693
4	2.282	9	1.816	14	1.672
5	2.114	10	1.777	15	1.653
6	2.004	11	1.744		

NEW QUESTION 66
- (Topic 2)
A process shows the following number of defects. Each sample size for this process is 85. 3 8 2 7 7 6 8 8 9 5 Find the control limits.

A. none and 13.8
B. 12.6 and 25.2
C. none and 25.2
D. none of the above

Answer: A

NEW QUESTION 71
- (Topic 2)
When Tricia empties a box of capacitors she places it at a designated spot on her work table. Sam notices the empty box and brings a full box of capacitors from the stock room. This is an example of:

A. visual factory
B. kanban
C. poka-yoke
D. standard work
E. set up time reduction (SMED)

Answer: B

NEW QUESTION 72
- (Topic 2)
An important step in determining the VOC is:

A. establish viable or comprehensive process feedback loops
B. ascertain the principles that are values of the corporation
C. identify the customer
D. measure the virtual operating continuum potential
E. all of the above
F. none of the above

Answer: C

NEW QUESTION 75
- (Topic 2)
The formula for reliability during constant failure rate conditions is: Use this formula to find the reliability of a product at 800 hours if MTBF = 600 hours.

A. 0.87
B. 0.78
C. 0.37
D. 0.26
E. none of the above

Answer: D

NEW QUESTION 80
- (Topic 2)
A team wants a technique for obtaining a large number of possible reasons for excess variation in a dimension. They should use:

A. written and diagrammed work instructions

B. flow charts and process maps
C. cause and effect diagrams
D. Pareto chart
E. relationship matrix

Answer: C

NEW QUESTION 82
- (Topic 2)
The null hypothsis should be:

A. rejected
B. not rejected
C. accepted

Answer: A

NEW QUESTION 87
- (Topic 2)
Find the value of (12) in the ANOVA table. Assume:

$\alpha = 0.10$

ANOVA Table

Source	SS	df	MS	F ratio	F crit	P-value
x	1.48	1	(1)	(2)	(3)	(4)
Y	18.6	1	(5)	(6)	(7)	(8)
xxY	12.2	1	(9)	(10)	(11)	(12)
Error	2.1	4	(13)			

A. 16.4
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D. 23.2
E. 4.54
F. 12.2
G. 0.525
H. 2.82
I. 1.48
J. 35.4
K. 0.10<P<1
L. 0.05<P<0.10
M. 0.01<P<0.05
N. 0.005<P<0.01
O. 0<P<0.005

Answer: N

NEW QUESTION 88
- (Topic 2)
A process using a p-chart has pbar = 0.076 and nbar = 4.86. Find the control limits.

A. 0.069 and 0.083
B. 0.072 and 0.080
C. 0.040 and 0.112
D. 0.0756 and 0.0764
E. none of the above

Answer: C

NEW QUESTION 91
- (Topic 2)
A process shows the following number of defects. Each sample size for this process is 85. 3 8 2 7 7 6 8 8 9 5
What control chart should be used?

A. x-bar and R
B. median
C. individual and moving range
D. p
E. np
F. c
G. u
H. none of the above

Answer: F

NEW QUESTION 93
- (Topic 2)
Is this a left-tail, right-tail or two-tail test?

A. no
B. left-tail
C. right-tail
D. two-tail

Answer: C

NEW QUESTION 96
- (Topic 2)
An x-bar and R chart is used to monitor a process. One week ago a new type of raw material was introduced and since that time 60 points have been plotted on the xbar chart and all are in the middle third of the chart. The corresponding 60 points on the R chart are all below the average range. This indicates that:

A. the operator has been plotting the points incorrectly
B. it is time to recalibrate the gage used
C. it is time to recalculate the control limits
D. the material manager should be asked to go back to the previous raw material so thecharts will more accurately reflect the process

Answer: C

NEW QUESTION 101
- (Topic 2)
Find Cpk

A. 2.00
B. 0.56
C. 1.33
D. 0.44

Answer: D

NEW QUESTION 104
- (Topic 2)
In the theory of constraints the “subordinate” step refers to:

A. a listing of sub-processes
B. reducing the rate for some processes
C. the portion of the process flow chart that depends on the main flow
D. the less important product or service stream
E. none of the above

Answer: B

NEW QUESTION 105
- (Topic 2)
A team wants to make a schedule for a project showing which tasks must be done sequentially and which may be done simultaneously. Which tool is most appropriate?

A. matrix diagram
B. cause and effect diagram
C. process decision program chart
D. affinity diagram
E. activity network diagram
F. tree diagram
G. prioritization matrix
H. matrix diagram
I. interrelationship digraph

Answer: E

NEW QUESTION 110
- (Topic 2)
SMED is an acronym for activity that:

A. involves housekeeping in the work area
B. makes mistakes of a certain type impossible
C. emphasizes the pull of the customer
D. reduces set up time
E. none of the above
F. all of the above

Answer: D

NEW QUESTION 111
- (Topic 2)
If the value of the test statistic had been 0.185, what action should have been taken regarding the null hypothesis?

A. rejected
B. accepted
C. none of the above
D. all of the above

Answer: C

NEW QUESTION 114
- (Topic 2)
One of the approaches used by TRIZ is referred to as “removing the contradiction.” A project team is asked to determine how many coats of paint should be applied to a panel. In this case the contradiction is:

A. additional coats cost money but give a better finish
B. the customer wants an excellent finish at a low cost
C. the company wants to reduce costs but have an excellent finish

Answer: A

NEW QUESTION 115
- (Topic 2)
An indication of the experimental error is available because the design has:

A. multiple replications
B. multiple levels
C. multiple factors

Answer: A

NEW QUESTION 116
- (Topic 2)
If it is desirable to maximize the response R, the following levels should be used:

A. A+ and B+
B. A+ and B–
C. A– and B+
D. A– and B–
E. none of the above

Answer: A

NEW QUESTION 119
- (Topic 2)
The number of factors, levels and replications:

A. 3, 3, 3
B. 2, 3, 2
C. 3, 2, 2,
D. 3, 2, 3
E. 2, 2, 2
F. none of the above

Answer: D

NEW QUESTION 121
- (Topic 2)
As opposed to earlier emphases lean manufacturing tends to stress:

A. making value added activities more efficient
B. eliminating, simplifying or reducing non-value added activities

Answer: B

NEW QUESTION 122
- (Topic 2)
What is the value of the test statistic?

A. 0.898
B. 1.251
C. 0.429
D. 3.57
E. none of the above

Answer:

E

Explanation:
As per reference to the given table in the URL, the 0.05 at 6 is 2.447. Hence none of the answers are correct.
Reference: http://www.medcalc.org/manual/t-distribution.php

NEW QUESTION 126
- (Topic 2)
A complex system has many causes and effects. These may be illustrated on which of the following:

A. matrix diagram
B. cause and effect diagram
C. process decision program chart
D. affinity diagram
E. activity network diagram
F. tree diagram
G. prioritization matrix
H. matrix diagram
I. interrelationship digraph

Answer: C

NEW QUESTION 131
- (Topic 2)
In an experimental design context, replication refers to:

A. duplicating experimental results at another location
B. repeating a test with the same factor levels
C. obtaining the same or similar results from different factors
D. repeating an experiment but using at least one different factor level

Answer: C

NEW QUESTION 135
- (Topic 2)
If item A is more likely to be detected than item B which will have the highest Severity value?

A. item A
B. item B
C. cannot be determined

Answer: C

NEW QUESTION 138
- (Topic 2)
A helpful time to use a Quality Function Deployment matrix is:

A. while planning for a new or redesigned process
B. while planning for new or redesigned parts
C. while planning for a new or redesigned product
D. all of the above
E. none of the above

Answer: D

NEW QUESTION 139
- (Topic 2)
A frequent cause of system sub optimization is:

A. optimizing individual processes
B. failing to draw a system flow chart
C. using data with outliers
D. failing to consider the normal distribution

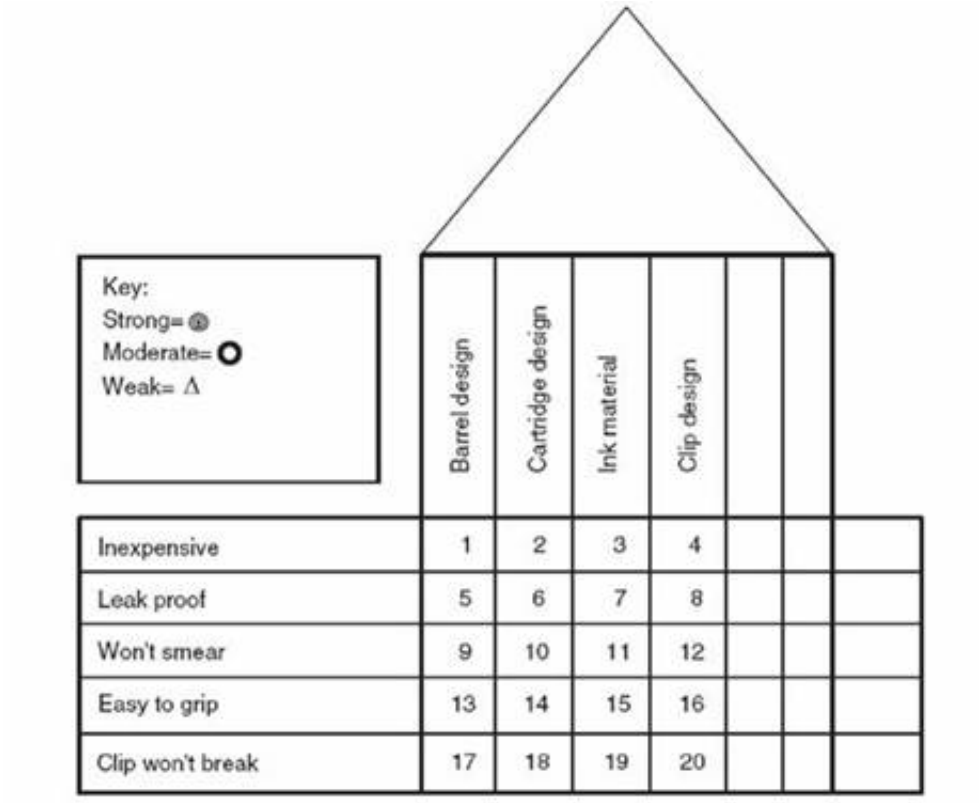
Answer: A

NEW QUESTION 142
- (Topic 2)
A robust design is one which:

A. has high reliability
B. has low maintenance frequency
C. is simple to manufacture
D. is resistant to varying environmental conditions

Answer: D

NEW QUESTION 145
- (Topic 2)
This QFD matrix was used in the design process for a ball point pen. What symbol is appropriate for the square labeled 16?



A.
B.
C.

A. none of the above

Answer: C

NEW QUESTION 149
- (Topic 2)
An x-bar control chart has been established with control limits of 3.245 and 3.257, n = 5. An engineer collects the following sample and plots the average on the control chart: 3.257, 3,256, 3. 258, 3.259

A. the process is out of control
B. the process is not out of control
C. the engineer misused the control chart
D. the control limits are incorrect

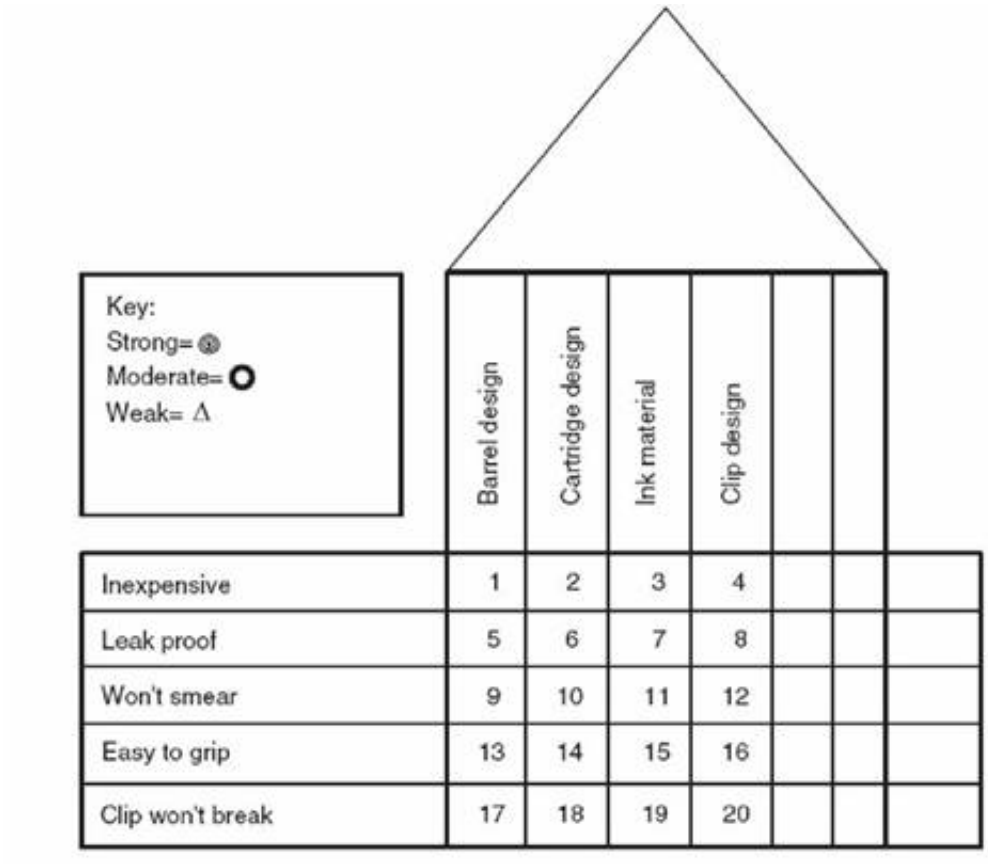
Answer: C

NEW QUESTION 150
- (Topic 2)
An x-bar and R chart has four part measurements per sample The control limits on the averages chart are 2.996 and 3.256. Assume the process data form a normal distribution.What is the probability that the next plotted point falls outside the control limits?

A. 0.00135
B. 0.0027
C. 0.0054
D. none of the above

Answer: B

NEW QUESTION 153
- (Topic 2)
This QFD matrix was used in the design process for a ball point pen. What symbol is appropriate for the square labeled 15?



A.
B.
C.

A. none of the above

Answer: D

NEW QUESTION 157
- (Topic 2)
The average number of defects is 21.6. Find the upper control limit for the c-chart.

A. 26.4
B. 24.6
C. 18.8
D. 26.2
E. none of the above

Answer: E

NEW QUESTION 159
- (Topic 2)
The mean of a Poisson distribution is 2.94. It's variance is:

A. Not enough information is given
B. 1.71
C. 8.64
D. 74.7
E. 1.31

Answer: C

Explanation:
The correct answer is C because the mean of poisson distribution is 2.94, hence the variance would be 8.64
U =
variance = 2

NEW QUESTION 161
- (Topic 2)
The following is a set of individual measurements: 3 5 4 5 6 3 4 3 2 4 5 6 5 7 6 4 5 5 8 7 6 6 7 7 4
Find the control limits for the range chart.

A. none and 4.2
B. none and 5.1
C. 0.2 and 1.5
D. none of the above

Answer: A

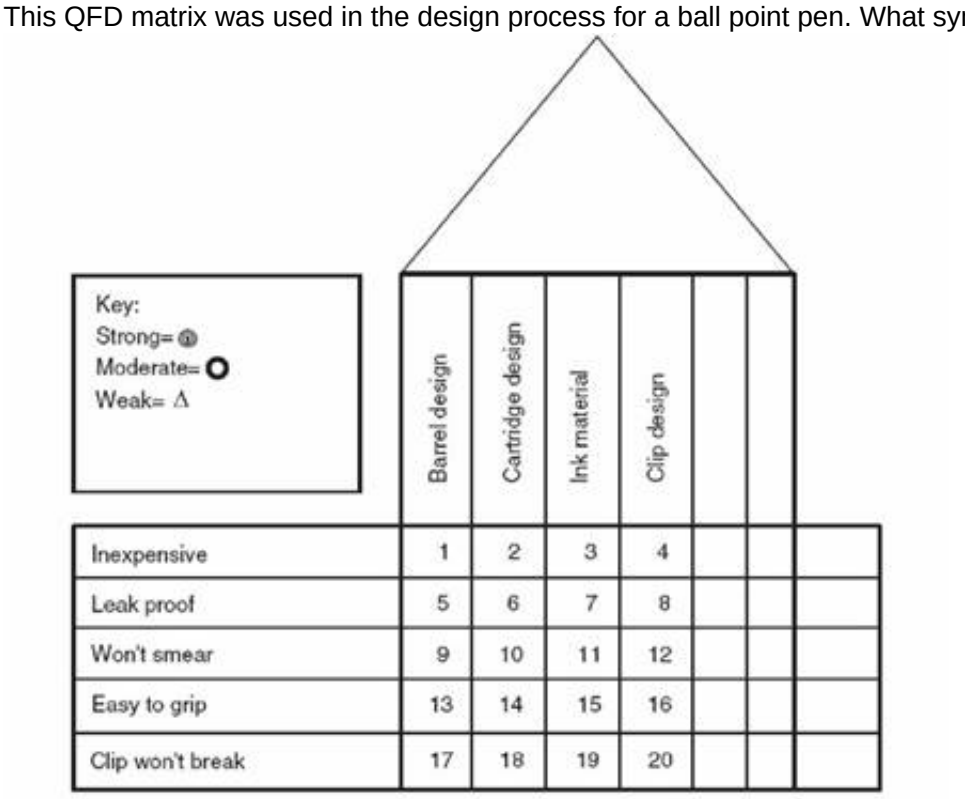
NEW QUESTION 164
- (Topic 2)
Proposed Six Sigma projects that are not in some way linked to organizational goals:

A. will typically be short term

B. use statistical inference
C. have a high risk of failure
D. should not be approved
E. none of the above

Answer: D

NEW QUESTION 167
- (Topic 2)
This QFD matrix was used in the design process for a ball point pen. What symbol is appropriate for the square labeled 13?



A.
B.
C.

A. none of the above

Answer: B

NEW QUESTION 168
.....

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