

# ASQ

## Exam Questions CSSBB

Certified Six Sigma Black Belt



#### NEW QUESTION 1

- (Topic 1)

Causes in a cause and effect diagram often include management, measurement systems, mother nature and the four standard causes:

- A. man, material, methods, machines
- B. man, manufacturing, methods, material
- C. marketing, methods, material, machines
- D. man, material, millennium, machines
- E. none of the above

**Answer:** A

#### 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 team has been asked to reduce the cycle time for a process. The team decides to collect baseline data. It will do this by:

- A. seeking ideas for improvement from all stakeholders
- B. researching cycle times for similar processes within the organization
- C. obtaining accurate cycle times for the process as it currently runs
- D. benchmarking similar processes outside the organization

**Answer:** C

#### NEW QUESTION 4

- (Topic 1)

Find the value of (1) 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:** I

#### NEW QUESTION 5

- (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 6

- (Topic 1)

The word “champion” in the context of Six Sigma projects refers to:

- A. the team that has had the most impact on the bottom line.
- B. the person who has coordinated teams most effectively
- C. the individual who has outpaced all others in six sigma knowledge
- D. none of the above

**Answer:** D

#### NEW QUESTION 7

- (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 8

- (Topic 1)

The team in the above problem draws arrows from Post-It® notes that are causes to notes that are the effects of these causes. This step is best described by which approach to problem solving?

- 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:** B

#### NEW QUESTION 9

- (Topic 1)

When comparing two vendors’ machines it is found that a sample of 1000 parts from machine A has 23 defectives and a sample of 1300 parts from machine B has 36 defectives. Do the data indicate that machine B has a higher rate of defectives?

- A. yes
- B. no
- C. all of the above

**Answer:** A

#### NEW QUESTION 10

- (Topic 1)

There are 14 different defects that can occur on a completed time card. The payroll department collects 328 cards and finds a total of 87 defects. DPU =

- A.  $87 \div 328$
- B.  $87 \div (328 \times 14)$
- C.  $14 \div 87$
- D.  $87 \div 14$
- E.  $328 \div 87$
- F.  $87 \times 1,000,000 \div (14 \times 328)$

**Answer:** A

#### NEW QUESTION 10

- (Topic 1)

The primary metric for a project is reduced cost for process A . Baseline data might include:

- A. current maintenance costs
- B. current selling price for the products or services output by process A
- C. current suggestions from stakeholders of process A
- D. all the above
- E. none of the above

Answer: A

NEW QUESTION 11

- (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
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- 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 12

- (Topic 1)

= 0.05 The average weight of castings produced at the Nebraska foundry is 3.7 lbs. A new supplier from Kansas has submitted a batch of castings known to have normally distributed weights. A random sample of 10 has an average weight of 3.6 lbs. and standard deviation 0.06 lbs. Do these data indicate that the Kansas foundry produce lighter castings on average?

- A. yes
- B. no

Answer: A

NEW QUESTION 15

- (Topic 1)

= 0.05 A sample of size 50 from machine A has a mean of 18.2 and standard deviation 3.1. A sample of size 40 from machine B has mean 17.6 and standard deviation 2.8. Do these data indicate that the population for machine A has a larger mean? Assume the populations are normal.

- A. yes
- B. no

Answer: B

NEW QUESTION 20

- (Topic 1)

An engineer wants to try two hardening ovens to see whether they have different hardness scores. She cuts 8 pieces of bar stock in half, putting half of each in oven A and the other half in oven B. The following data are collected: Do the data indicate that the ovens have different average scores? Assume differences are normally distributed.

Piece #	1	2	3	4	5	6	7	8
Oven A	20.3	19.7	21.4	22.0	21.6	21.0	20.8	20.8
Oven B	19.7	20.0	20.1	21.2	21.4	20.7	21.0	19.6

- A. yes
- B. no

Answer: B

#### NEW QUESTION 25

- (Topic 1)

Find the value of (5) 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:** C

#### NEW QUESTION 26

- (Topic 1)

A project activity not on the critical path has required 20% longer than the time originally allocated. The project team should:

- A. inform all concerned that the entire project will be delayed by 20%
- B. inform all concerned that the entire project will be delayed but by less than 20%
- C. study the effect this will have on other activities because the project may still be on schedule

**Answer:** C

#### NEW QUESTION 30

- (Topic 1)

There are 14 different defects that can occur on a completed time card. The payroll department collects 328 cards and finds a total of 87 defects. DPMO =:

- A.  $87 \div 328$
- B.  $87 \div (328 \times 14)$
- C.  $14 \div 87$
- D.  $87 \div 14 \times 1,000,000$
- E.  $328 \div 87$
- F.  $87 \times 1,000,000 \div (14 \times 328)$

**Answer:** F

#### NEW QUESTION 33

- (Topic 1)

The support for an important quality initiative was lacking in congress until Reagan's Secretary of Commerce was killed in a horseback riding accident in 1987. That initiative was:

- A. assigning National Institute for Standards and Technology (NIST) quality oversight duties
- B. "consensus of the House" proclamation for Deming's 14 points
- C. changing National Bureau of Standards to NIST.
- D. authorizing the American National Standards Institute (ANSI) to join with the International Standards Organization (ISO) to promulgate standards.
- E. none of the above.

**Answer:** E

#### NEW QUESTION 36

- (Topic 1)

A stable, normally distributed process with specification 3.50 .03 has  $\bar{x} = 3.51$  and  $s = .016$ . What percent of the production violates specification?

- A. 16.43%
- B. 12.62%
- C. 18.58%
- D. 11.18%

Answer: D

NEW QUESTION 38

- (Topic 2)

An example of a project metric would be:

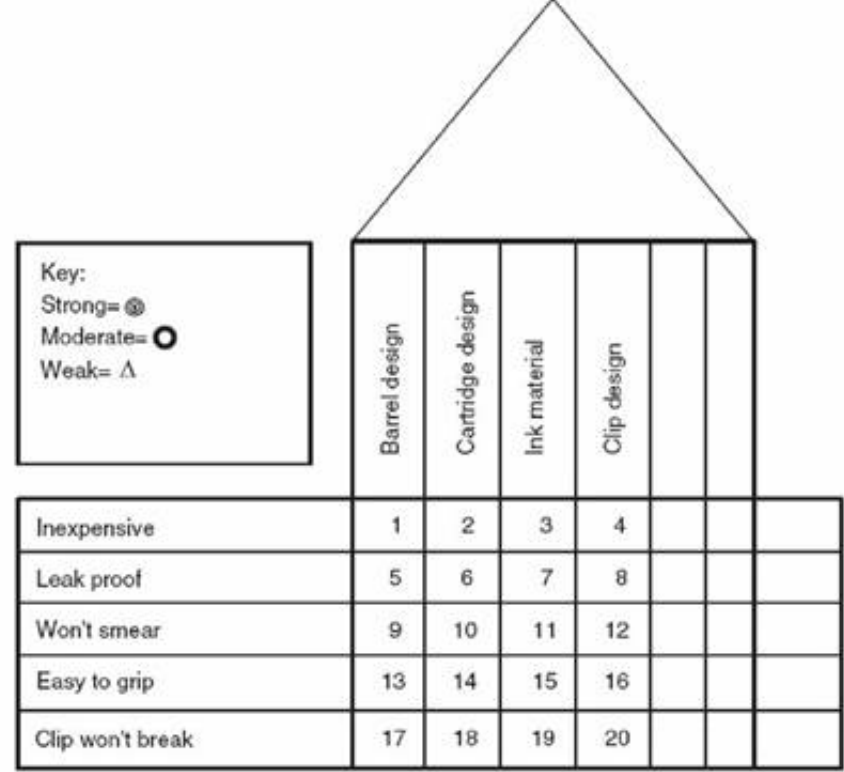
- A. the decrease in defect occurrence
- B. the decrease in product cost
- C. the decrease in cycle time
- D. all the above

Answer: D

NEW QUESTION 43

- (Topic 2)

This QFD matrix was used in the design process for a ball point pen. What symbol is appropriate for the square labeled 4?



- A.
- B.
- C.

A. none of the above

Answer: B

NEW QUESTION 46

- (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 part measurement falls outside the control limits?

- A. 0.00135
- B. 0.0027
- C. 0.0681
- D. 0.1362
- E. 0.2724
- F. none of the above

Answer: D

NEW QUESTION 51

- (Topic 2)

A correct statement about the relationship between the terms parameter and statistic is:

- A. a population statistic is more accurate than a parameter
- B. a sample parameter is used to estimate a statistic
- C. a sample statistic is used to estimate a population parameter
- D. standard deviation calculations requires both statistics and parameters

Answer: C

NEW QUESTION 52

- (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 individuals chart.

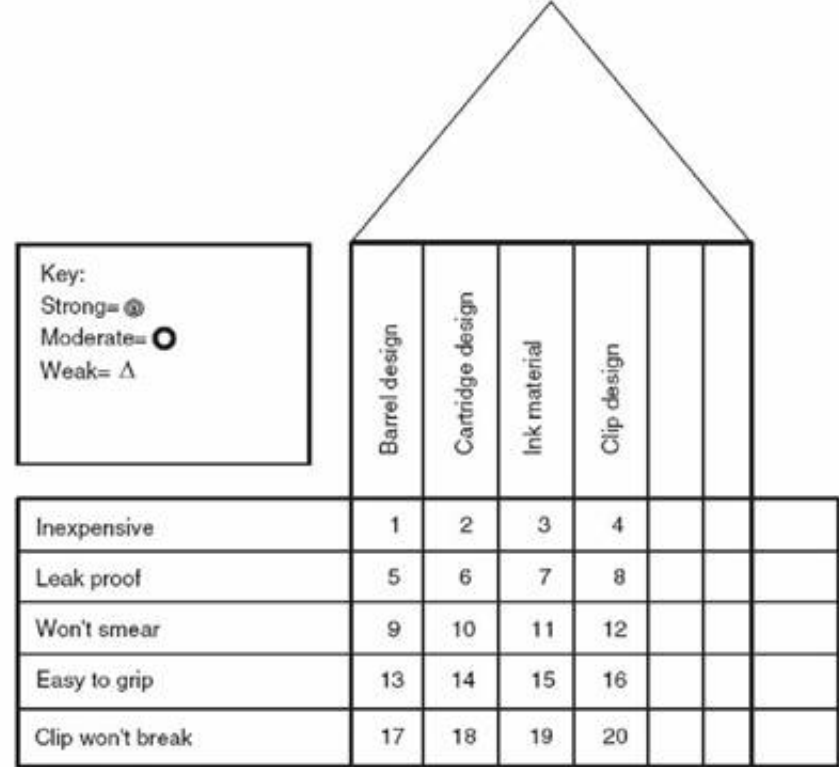
- A. .7 and 11.2

- B. 1.6 and 8.6
- C. 2.7 and 7.5
- D. none of the above

Answer: D

NEW QUESTION 55

- (Topic 2)  
This QFD matrix was used in the design process for a ball point pen. What symbol is appropriate for the square labeled 1?



- A.
- B.
- C.
- A. none of the above

Answer: B

NEW QUESTION 60

- (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 62

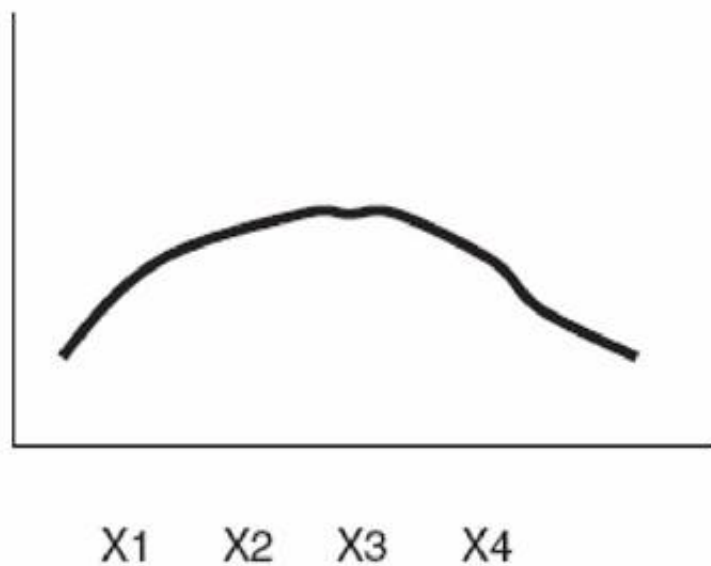
- (Topic 2)  
A process produced 1394 units. During this time 11 defects were detected. The Rolled Throughput Yield ( RTU) is approximately:

- A. 0.992
- B. 7.89
- C. 0.00789
- D. 1.008
- E. all of the above
- F. none of the above

Answer: A

NEW QUESTION 64

- (Topic 2)  
Which value of x will minimize transmitted noise?



- A. X1
- B. X2
- C. X3
- D. X4

**Answer: C**

#### NEW QUESTION 69

- (Topic 2)

A control chart is to be used to display the number of non-conducting diodes. Each point on the chart represent the number of bad diodes in a box of 1000. The appropriate control chart to use is:

- A. x-bar and R
- B. median
- C. individual and moving range
- D. p
- E. np
- F. u
- G. c

**Answer: E**

#### NEW QUESTION 73

- (Topic 2)

A set of data from a process has 8 readings per sample and 50 samples. The mean of the 50 sample means is 12.62. The mean of the 50 ranges is 0.18. A customer requires that SPC charts be done on their forms which have spaces for only 5 readings per sample. What should be the UCL and LCL for the new averages chart?

- A. 12.53 and 12.71
- B. 12.58 and 12.66
- C. 11.61 and 13.63
- D. none of the above

**Answer: A**

#### NEW QUESTION 76

- (Topic 2)

A process shows the following number of defectives. 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 13.5
- B. 12.6 and 25.2
- C. none and 25.2
- D. none of the above

**Answer: A**

#### NEW QUESTION 78

- (Topic 2)

A normal probability plot is used to:

- A. determine whether the distribution is normal
- B. plot z values
- C. determine process capability
- D. find percent out of specification

**Answer: A**

#### NEW QUESTION 79

- (Topic 2)



Quality Function Deployment is a tool to aid in:

- A. analyzing non-paired data
- B. determining if quality procedures being followed on the shop floor
- C. ascertaining which processes are functioning correctly
- D. linking customer requirements to product features
- E. all of the above
- F. none of the above

**Answer:** D

**NEW QUESTION 80**

- (Topic 2)

For a line in an FMEA form a team has established the following: Cost: \$82 Severity: 7 Occurrence: 9 Detection: 4 Target date: 7 days What should the risk priority number (RPN) be for this line:

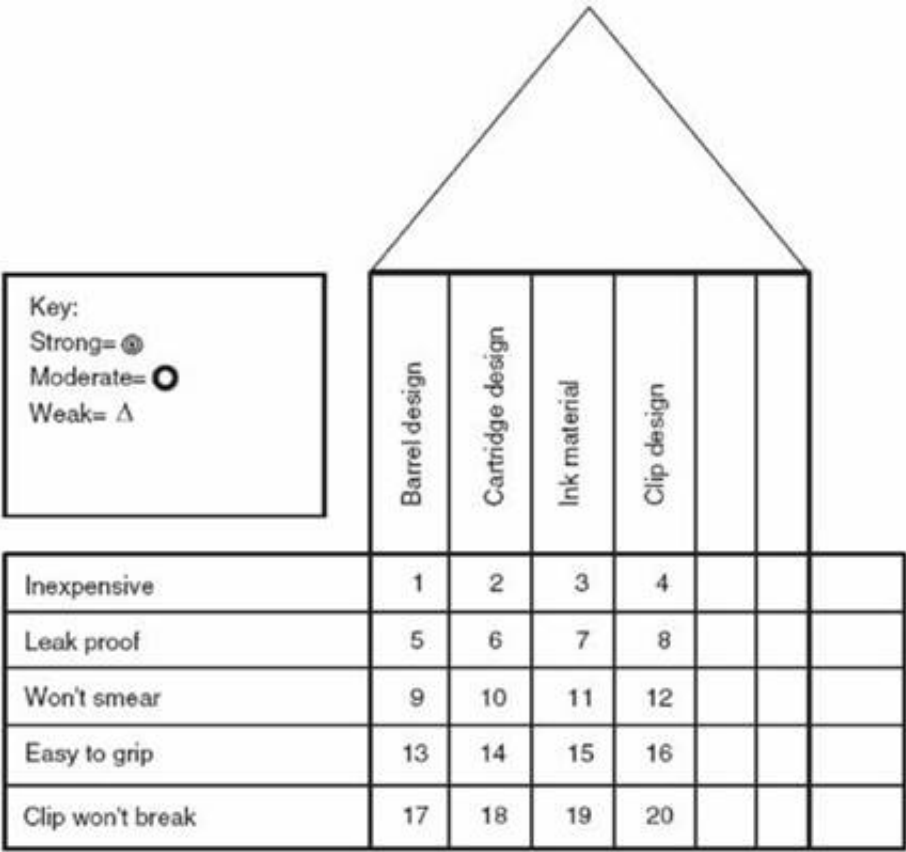
- A. 144,648
- B. 252
- C. 1764
- D. 63
- E. none of the above

**Answer:** B

**NEW QUESTION 85**

- (Topic 2)

This QFD matrix was used in the design process for a ball point pen. What symbol is appropriate for the square labeled 7?



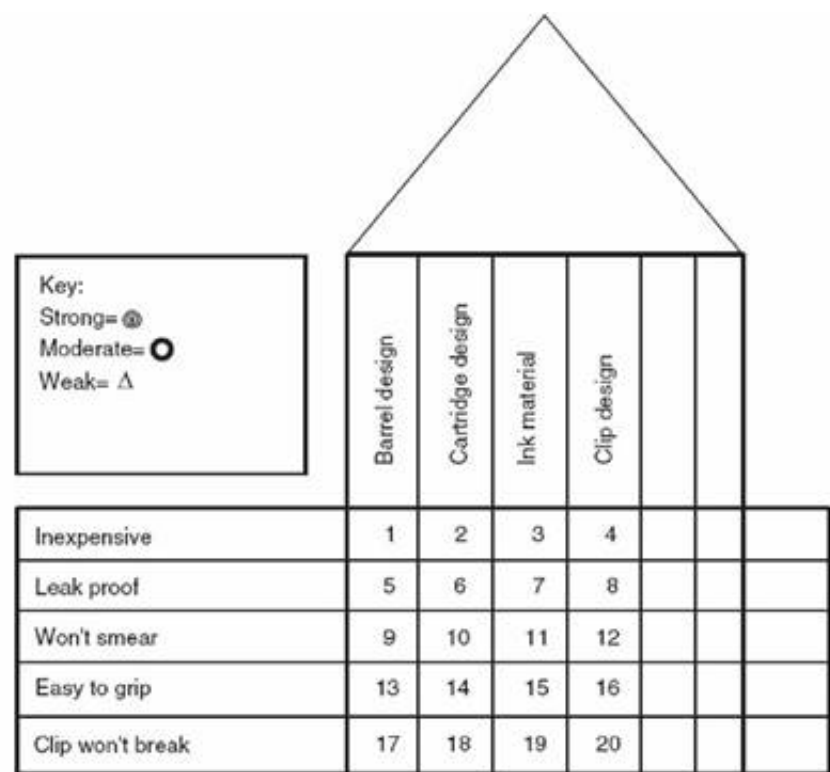
- A.
- B.
- C.
- A. none of the above

**Answer:** B

**NEW QUESTION 87**

- (Topic 2)

This QFD matrix was used in the design process for a ball point pen. What symbol is appropriate for the square labeled 5?



- A.
- B.
- C.

A. none of the above

Answer: A

NEW QUESTION 89

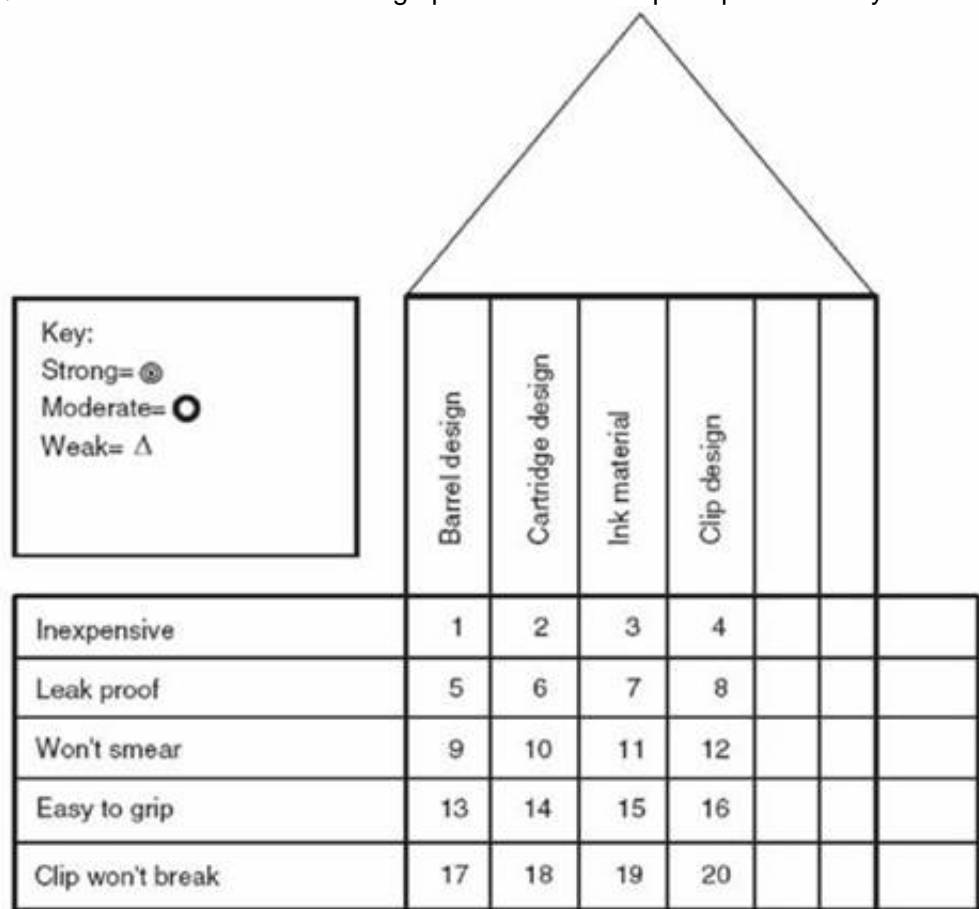
- (Topic 2)  
Dr. W. Edwards Deming:

- A. lectured in Japan after World War II
- B. was an author of several books in the US
- C. lectured widely in the US
- D. is considered an expert in the quality field
- E. all of the above
- F. none of the above

Answer: E

NEW QUESTION 94

- (Topic 2)  
This QFD matrix was used in the design process for a ball point pen. What symbol is appropriate for the square labeled 8?



- A.
- B.
- C.

A. none of the above

Answer: D

**NEW QUESTION 97**

- (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 100**

- (Topic 2)

Dr. Joseph M. Juran:

- A. lectured in Japan after World War II
- B. was an author of several books in the US
- C. lectured widely in the US
- D. is considered an expert in the quality field
- E. all of the above
- F. none of the above

**Answer:** E

**NEW QUESTION 102**

- (Topic 2)

A project whose definition does not include performance metrics:

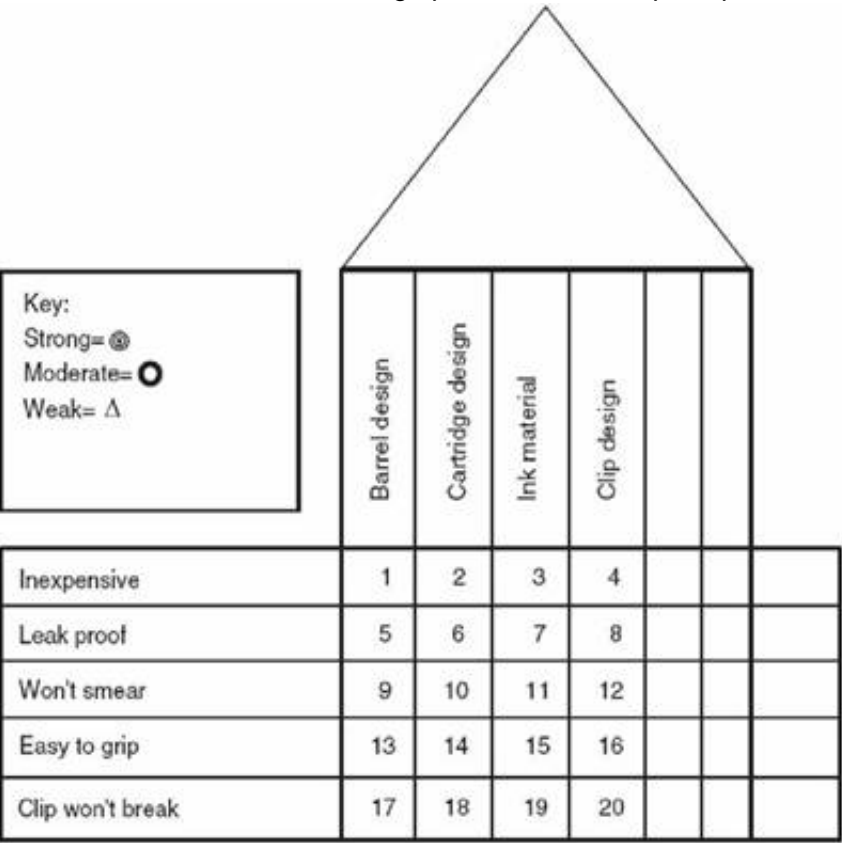
- A. will typically be short term
- B. use statistical inference
- C. have a high risk of failure
- D. should not be approved
- E. none of the above

**Answer:** D

**NEW QUESTION 103**

- (Topic 2)

This QFD matrix was used in the design process for a ball point pen. What symbol is appropriate for the square labeled 3?



- A.
- B.
- C.
- A. none of the above

**Answer:** B

**NEW QUESTION 105**

- (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 108**

- (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 112**

- (Topic 2)

A principle advantage of fractional factorial experimental designs is:

- A. reduced cost
- B. improved accuracy
- C. increased confounding
- D. higher confidence level
- E. reduced probability of type II errors

**Answer:** A

**NEW QUESTION 113**

- (Topic 2)

Data are collected in xy pairs and a scatter diagram shows the points are grouped very close to a straight line that tips down on its right hand end. A reasonable value for the coefficient of correlation is:

- A. .8
- B. −.9
- C. 1
- D. 1.3
- E. −1.8

**Answer:** C

**NEW QUESTION 117**

- (Topic 2)

A principle disadvantage of fractional factorial experimental designs is:

- A. reduced cost
- B. improved accuracy
- C. confounding of effects
- D. higher confidence level
- E. reduced probability of type II errors

**Answer:** C

**NEW QUESTION 120**

- (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 123**

- (Topic 2)

Approximately what percent of the data values are smaller than the mean?

- A. 25%
- B. 50%
- C. 75%
- D. it varies from 0% and 99+% inclusive

**Answer:** D

**NEW QUESTION 126**

- (Topic 2)

Find the value of m or b1:

- A. 0.25
- B. 0.63
- C. 0.75
- D. 1.22

**Answer: C**

**NEW QUESTION 129**

- (Topic 2)

A team has completed a brainstorming session that has generated a large number of ideas. The team needs to organize these ideas in natural groupings. 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: D**

**NEW QUESTION 130**

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