

# ASQ

## Exam Questions CSSBB

Certified Six Sigma Black Belt



#### NEW QUESTION 1

- (Topic 1)

Deming called the technique of studying a sample to gain understanding of the distribution of a population an “enumerative study.” His main objection to these studies was:

- A. they are too difficult to perform correctly
- B. they require extensive use of computers
- C. they assume a stable distribution
- D. random samples are expensive to obtain
- E. these studies have a high probability of Type II error

**Answer: C**

#### NEW QUESTION 2

- (Topic 1)

(Refer to the previous problem) To estimate the within treatment variance the experimenters would calculate the variances of:

- A. all 80 readings
- B. the five replications for each run
- C. the runs for which a factor is at its lowest level

**Answer: B**

#### NEW QUESTION 3

- (Topic 1)

The median is a better choice than the mean for a measure of central tendency if the data:

- A. is bimodal
- B. often has outliers
- C. is normally distributed
- D. is exponentially distributed

**Answer: B**

#### NEW QUESTION 4

- (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.  $1,000,000 \div 2500 \times 3$
- B.  $2500 \div 1,000,000 \times 3$
- C.  $3 \div 2500 \times 1,000,000$
- D.  $3 \times 2500 \div 1,000,000$

**Answer: C**

#### NEW QUESTION 5

- (Topic 1)

A team is investigating ways to reduce power outages. They determine that an outage can occur in only three ways: grid failure, local transformer failure or local overload. They then investigate each of these three events for possible causes, etc. They draw a diagram that “fans out” using the power outage as the handle of the fan. These improvements are 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: C**

#### NEW QUESTION 6

- (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 7

- (Topic 1)

This table displays the inventory of fasteners in a storage cabinet. An item is selected at random from the fastener cabinet. Find the approximate probability it is a bolt.

	size			
	.500	.625	.750	.875
Nut	146	300	74	41
Washer	280	276	29	32
Bolt	160	214	85	55

- A. 160
- B. .160
- C. .09
- D. .30
- E. none of the above

Answer: D

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

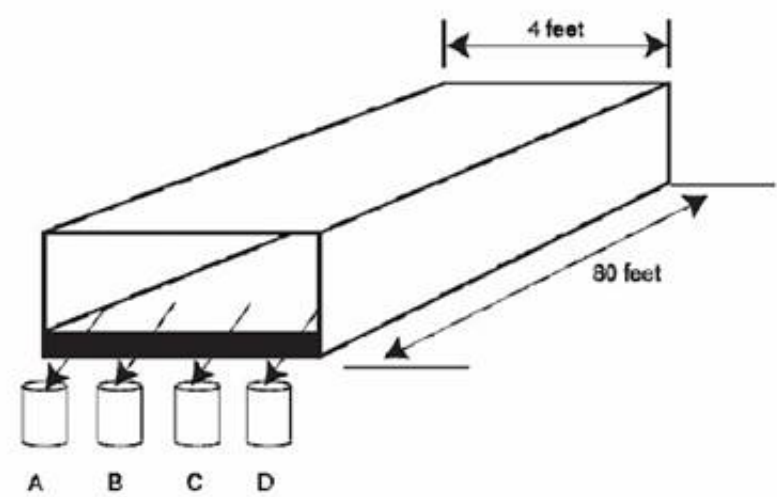
- A. I and II A stable, normally distributed process with specification 3.50 .03 has = = .016. What percent of the production violates specification?
- B. I only
- C. II only
- D. I and IV
- E. III and IV

Answer: E

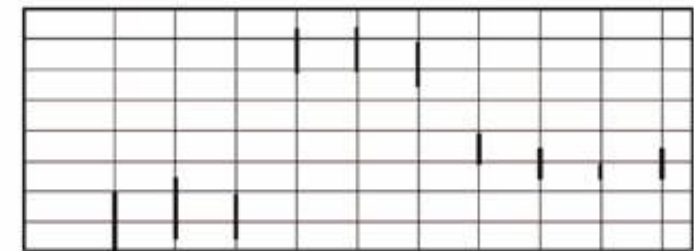
NEW QUESTION 9

- (Topic 1)

SCENARIO A Six Sigma team is measuring the moisture content of corn starch as it leaves the conveyer belt of a dryer. They collect one sample four cups of starch at times indicated in the chart at fixed locations labeled A, B, C, and D across the end of the belt. See the diagram below.



After some more work on the dryer, additional data are collected which when plotted looks like this:



Which type of variation dominates?

- A. within sample
- B. sample to sample within the hour
- C. hour to hour
- D. none of the above

Answer: C

NEW QUESTION 10

- (Topic 1)

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 10

- (Topic 1)

= 0.05 A machine tool vender wants to sell an injection molding machine. The current machine produces 3.2% defectives. A sample of 1100 from the vender 's machine has 2.9% defective. Do these numbers indicate that the proposed machine has a lower rate of defectives?

- A. yes
- B. no

**Answer:** A

#### NEW QUESTION 12

- (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 17

- (Topic 1)

If the probability that event A occurs is 0.51, the probability that event B occurs is 0.64 and that probability that both A and B occur is 0.23 then:

- A. events A and B are complementary
- B. events A and B are mutually exclusive
- C. events A and B are supplementary
- D. events A and B are not mutually exclusive
- E. events A and B are statistically independent

**Answer:** D

#### NEW QUESTION 18

- (Topic 1)

If the probability that an event will occur is 0.83, then the probability that the event will not occur is:

- A. 0.17
- B. 0.07
- C. 0.6889
- D. 1.20
- E. 83%

**Answer:** A

#### NEW QUESTION 22

- (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 mean of approximately:

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

**Answer:** A

#### NEW QUESTION 23

- (Topic 1)

According to the Central Limit Theorem:

- A. the median and the mean have the same value in a symmetric distribution
- B. the mode of a normal distribution is also the mean
- C. the mean of an exponential distribution is smaller than the median
- D. the mean, median and mode of a normal distribution all have the same value

E. none of the above

**Answer:** E

**NEW QUESTION 24**

- (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 28**

- (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 29**

- (Topic 1)

The leader in the quality movement who recommended that organizations "eliminate numerical quotas for the work force and numerical goals for management." :

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

**Answer:** F

**NEW QUESTION 33**

- (Topic 1)

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

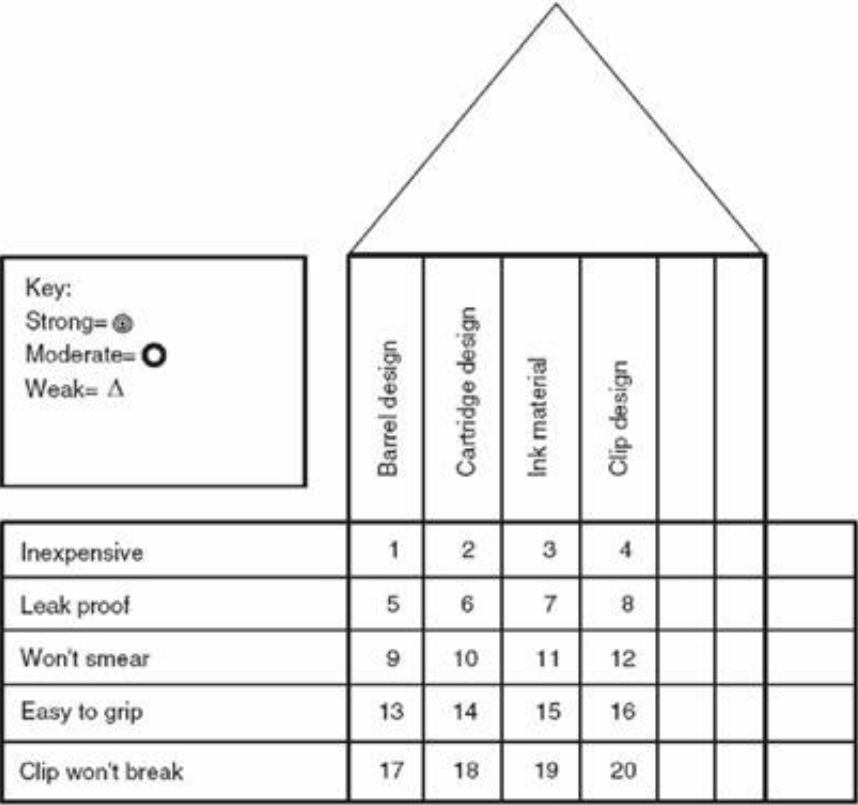
- A. 16.43%
- B. 12.62%
- C. 18.58%
- D. 11.18%

**Answer:** D

**NEW QUESTION 36**

- (Topic 2)

This QFD matrix was used in the design process for a ball point pen. What symbol is appropriate for the square labeled 11?



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

**Answer:** B

**NEW QUESTION 37**

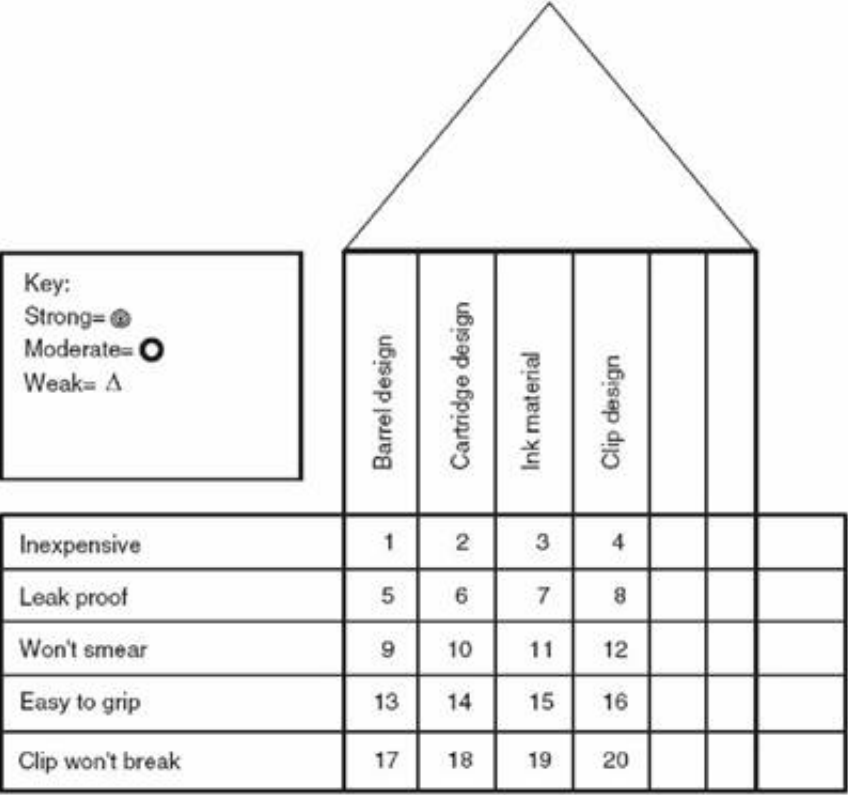
- (Topic 2)  
 An example of a project metric would be:

- 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 39**

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



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

**Answer:** B

**NEW QUESTION 43**

- (Topic 2)  
 At a particular time, three components are in parallel and each has a reliability of 0.98. What is the reliability of the system?

- A. 0.98
- B. 0.94
- C. 0.37
- D. 0.26
- E. none of the above

**Answer:** E

#### NEW QUESTION 45

- (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 47

- (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 51

- (Topic 2)

If item A is more likely to be detected than item B which will have the highest Detection value?

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

**Answer:** B

#### NEW QUESTION 55

- (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 60

- (Topic 2)

Find the value of (13) 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: G

NEW QUESTION 62

- (Topic 2)

The team development stage characterized by expression of individual opinions and ideas often without regard for team objectives is known as:

- A. performing
- B. norming
- C. conflicting
- D. storming
- E. brainstorming

Answer: D

NEW QUESTION 65

- (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 69

- (Topic 2)

Find the value of (11) 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. Choices Not available (but this Question Answer E)

Answer: A

NEW QUESTION 73

- (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

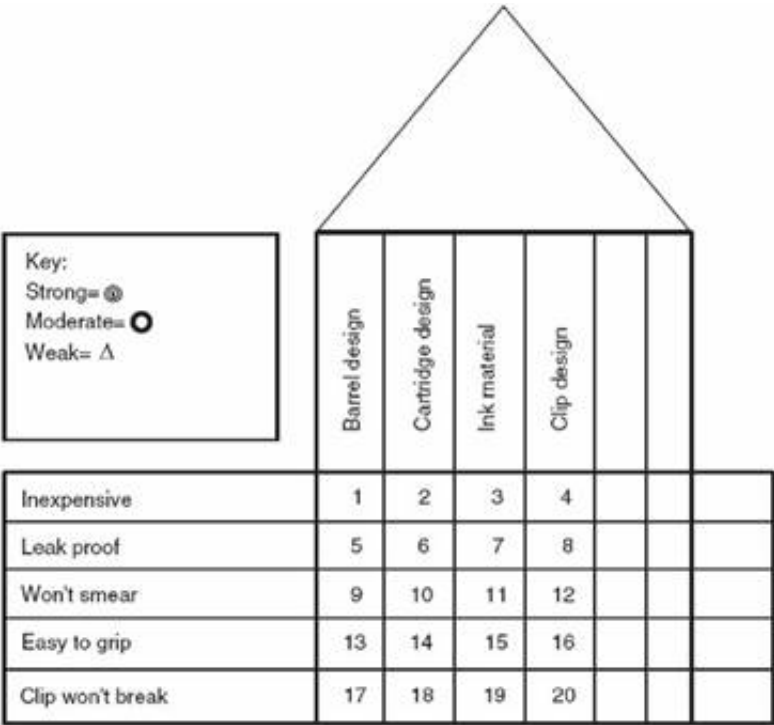
Answer: A

NEW QUESTION 78

- (Topic 2)

This QFD matrix was used in the design process for a ball point pen. What symbol is appropriate for the square labeled 9?





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

Answer: D

NEW QUESTION 80

- (Topic 2)  
The temperature in a storage location is logged once every 30 minutes. The control chart that is appropriate for displaying these values is:

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

Answer: C

NEW QUESTION 81

- (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 84

- (Topic 2)  
An advantage of using standard deviation rather than range for measuring dispersion of a large sample is that:

- A. standard deviation has a simpler formula
- B. calculators have a standard deviation key but not a range key
- C. standard deviation uses information from each measurement
- D. range calculations are not normally distributed

Answer: C

NEW QUESTION 86

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

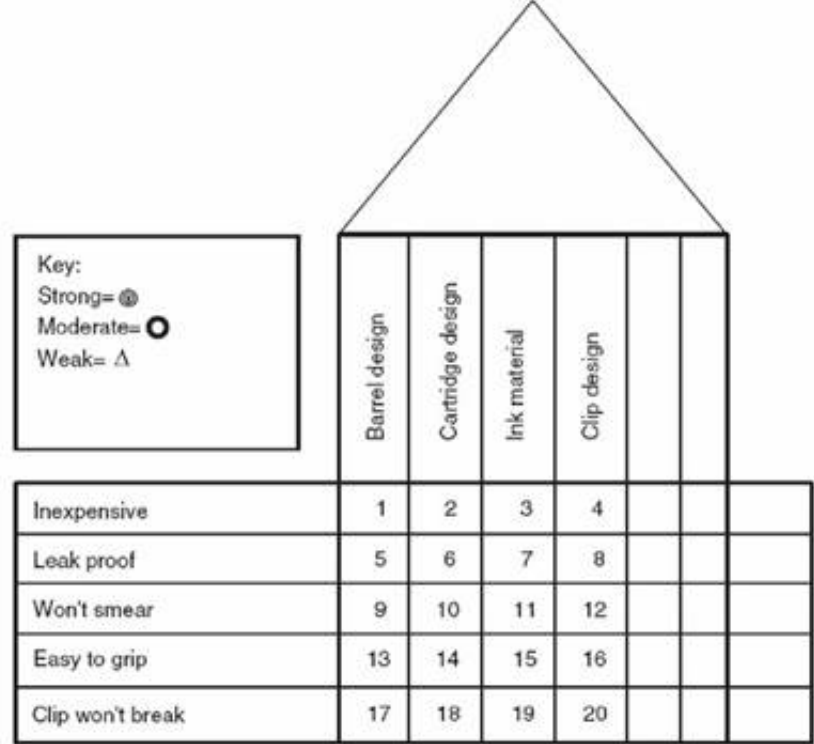
- A. no
- B. left-tail
- C. right-tail
- D. two-tail

Answer: C

**NEW QUESTION 90**

- (Topic 2)

This QFD matrix was used in the design process for a ball point pen. What symbol is appropriate for the square labeled 6?



- A.
- B.
- C.

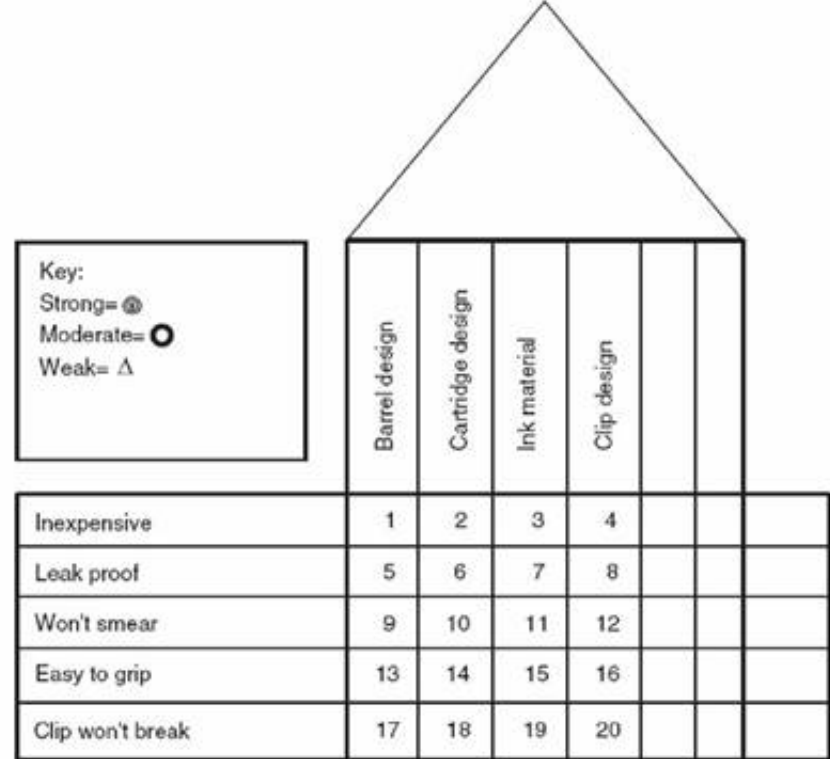
A. none of the above

Answer: B

**NEW QUESTION 95**

- (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 99**

- (Topic 2)

Work performed by the payroll department is considered value added activity.

- A. true
- B. false

Answer: B

**NEW QUESTION 102**

- (Topic 2)

The mean, median and mode of a distribution have the same value. What can be said about the distribution:

- A. it is exponential
- B. it is normal
- C. it is uniform
- D. none of the above

**Answer:** D

#### NEW QUESTION 103

- (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 105

- (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 108

- (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 110

- (Topic 2)

The test statistic is approximately:

- A. 4.79
- B. 6.71
- C. 2.08
- D. 5.44

**Answer:** A

#### NEW QUESTION 113

- (Topic 2)

number of scratches	6	5	7	5	6
sample size	120	110	111	128	110

A control chart will be used to monitor the number of scratches on a product. The following data have been collected: 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:** F

**NEW QUESTION 116**

- (Topic 2)

There have been some instances in which 1.5 inch sheet metal screws are used where 1.25 inch should have been used. This produces a critical defect. The decision is made to have all 1.25 inch screws have a square reduced head and all 1.5 inch screws be Phillips. This is an example of:

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

**Answer: C**

**NEW QUESTION 117**

- (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 121**

- (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 123**

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