



The Global Voice of Quality™

SAMPLE EXAMINATION

The purpose of the following sample examination is to provide an example of what is provided on exam day by ASQ, complete with the same instructions that are provided on exam day.

The test questions that appear in this sample examination are retired from the CQT pool and have appeared in past CQT examinations. Since they are now available to the public, they will NOT appear in future CQT examinations. This sample examination WILL NOT be allowed into the exam room.

Appendix A contains the answers to the sample test questions. ASQ will not provide scoring and analysis for this sample examination. Remember: These test questions will not appear on future examinations so your performance on this sample examination may not reflect how you perform on the formal examination. A self-appraisal of how well you know the content for the specific areas of the body of knowledge (BOK) can be completed by using the worksheet in Appendix B.

On page 2 of the instructions, it states “There are 100 questions on this 4-hour examination.” Please note that this sample exam only contains 50 questions.

If you have any questions regarding this sample examination, please email cert@asq.org

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The Global Voice of Quality™

NAME _____

CERTIFIED QUALITY TECHNICIAN

Please print your name above. Read all the instructions before beginning the examination. If you are unsure about any part of the instructions, consult your proctor.

General Instructions

All answers **must** be recorded on the Scantron Answer Sheet; no exam will be graded with the answers marked in the exam booklet.

1. Using a soft lead pencil (#2 or softer) only, blacken the circle of the correct answer. **Do not use ink.** If you change your answer, be sure to erase the previous answer completely.
2. Each question has **ONE** correct answer only.
3. This is a timed test; do not linger over difficult questions. Instead, skip the questions of which you are unsure; return to them when you reach the end of the test.
4. Do not fold, staple, or tear the answer sheets.
5. Although this is an open book examination and personally generated materials/notes from training or refresher courses **are** allowed, the following conditions apply:
 - Each examinee must make his/her reference materials available to the proctor for review.
 - Absolutely no collections of questions and answers or weekly refresher course quizzes are permitted. Reference sources that contain such copy are not allowed unless the questions and answers are removed or obscured. **Examples of such sources include but are not limited to refresher and preparatory primers.**
 - **Calculator Policy:** With the introduction of palmtop computers and increasing sophistication of scientific calculators, ASQ has become increasingly aware of the need to limit the types of calculators that are permitted for use during the examinations. **Any silent, hand-held, battery-operated calculator WITHOUT an alphabetic keyboard will be permitted; however, all programmable memory must be cleared from the calculator before you enter the exam room.** The examination is written so that a simple calculator will be sufficient to perform calculations.
 - No laptop or palmtop computers are allowed.
 - Reference materials and calculators may not be shared.
6. When you have finished, check your answer sheet to be sure it is properly identified with your name and member number. Return your examination booklet, answer sheet, examinee comment form and scratch paper to your proctor. You must sign the roster sheet to signify the return of your test booklet.
7. It is strictly forbidden to copy or remove examination materials. You will be disqualified from the examination and not certified by ASQ if you breach this trust.
8. **TEST RESULTS** – you can check your test results 7-9 days after the exam date by logging into the www.asq.org website and navigating to the Certification webpage. Otherwise, your exam results will be mailed in approximately three weeks. **Please Be Patient** we do not answer telephone requests for results.

CERTIFIED QUALITY TECHNICIAN Test

Directions: Each of the questions or incomplete statements below is followed by four suggested answers or completions. Select the one that is best in each case and then fill in the corresponding space on the answer sheet.

1. One advantage of 100% inspection over sampling inspection is that 100% inspection
 - (A) provides more information about quality levels
 - (B) gives zero defects to the customer
 - (C) reduces the personal bias of the inspector
 - (D) requires less machine-operator training

2. When the term “R & R” is applied to digital calipers, it refers to
 - (A) removal and replacement
 - (B) relativity and reproducibility
 - (C) repeatability and reliability
 - (D) repeatability and reproducibility

3. The proper method of placing parts on a surface plate and then removing them is
 - (A) rotate on and slide off
 - (B) rotate on and lift off
 - (C) set on and slide off
 - (D) set on and lift off

4. Who is responsible for determining whether a follow-up response is sufficient to close out an internal audit?
 - (A) Executive management
 - (B) The quality manager
 - (C) The audit team leader
 - (D) The internal auditee

5. Which of the following methods is used to develop an exhaustive list of ideas about a subject?
 - (A) Goal-setting
 - (B) Brainstorming
 - (C) Benchmarking
 - (D) Problem-solving

6. A document that asserts that a product conforms to specification is known as a certificate of
 - (A) qualification
 - (B) validation
 - (C) calibration
 - (D) compliance

7. Confidence limits are generated in order to define the
 - (A) limits of random variation around a control value
 - (B) limits that contain all future observations
 - (C) interval within which a population parameter lies
 - (D) amount of variation that the process exhibits

8. The purpose of a calibration schedule is to
 - (A) detect deterioration of accuracy
 - (B) meet ISO audit requirements
 - (C) test inspector performance
 - (D) increase product acceptance

CQT-SAMPLE EXAM

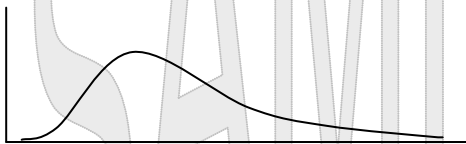
9. What is the percent yield for a normally distributed process in which the item length specification is 5.750 ± 0.004 , \bar{X} is 5.752, and the standard deviation is 0.002 ?
- (A) 15.73%
 - (B) 19.15%
 - (C) 47.72%
 - (D) 83.99%

10. In preparation for construction of a cause and effect diagram, it is important to
- (A) plot separate charts for each source
 - (B) focus only on what makes things go wrong
 - (C) record everything people suggest
 - (D) validate possible root causes

11. A quality technician uses a c chart to monitor the number of defects in a square foot of material. After the initial startup period, the mean number of defects is calculated at 13.5. What should the control limits be for the c chart?

	<u>LCL</u>	<u>UCL</u>
(A)	0.00	54.00
(B)	0.00	27.00
(C)	2.48	24.52
(D)	9.83	17.17

12.



The shape of the distribution above is best described as

- (A) normal
- (B) multi-modal
- (C) positively skewed
- (D) negatively skewed

13. A material review board (MRB) usually has the responsibility for which of the following?
- (A) Analyzing and dispositioning of nonconforming material
 - (B) Defining the statistical specifications of nonconforming material
 - (C) Assuring the availability of materials to meet production schedules
 - (D) Controlling the cost of materials

14. The most common form of specification in manufacturing facilities is the
- (A) control plan
 - (B) operator instruction sheet
 - (C) blueprint
 - (D) in-process check sheet

15. Statistical quality control generally requires inspection to be conducted
- (A) at the warehouse to maintain quality of parts in storage
 - (B) immediately after the production run has been completed
 - (C) close to the point of production of the part
 - (D) when the product is received by the customer

16. A process is running 1.5% defective. The sampling plan used for this process is $n=40$; $\text{accept/reject} = 2/3$. What is the probability of rejecting a lot from this process?
- (A) 0.0221
 - (B) 0.0988
 - (C) 0.1209
 - (D) 0.3328

17. Inspection accuracy increases with
- (A) reductions in defect rates
 - (B) repeated inspections
 - (C) additional product complexity
 - (D) order of sample selection

18. If a distribution is normal, with $\mu = 50$ and $\sigma = 15$, what percentage of data will be less than 30 ?
- (A) 59.18%
 - (B) 40.82%
 - (C) 9.18%
 - (D) 1.33%
19. The primary purpose of a first-article inspection is to
- (A) teach the inspector how to check the part
 - (B) gather information on process capability
 - (C) verify that the sampling plan is appropriate
 - (D) ensure that the part conforms to specifications
20. The reduction or elimination of incoming inspection stations should be considered only when
- (A) evidence of supplier process control techniques is provided for the material used
 - (B) evidence of a high defect rate is present in the manufacturing operation
 - (C) the next process step will mask defects
 - (D) it is cost-prohibitive to the supplier to test the parts
21. A company is receiving an unusually high number of returns from various customers. The first step in investigating the problem would be to
- (A) check the inspection records
 - (B) establish the correlation of the returns to shipments
 - (C) brainstorm the potential causes
 - (D) classify the returns by type and degree of seriousness
22. A long-term corrective action plan is best described as a
- (A) remedial action already taken
 - (B) temporary action on a current condition
 - (C) permanent action on an underlying cause
 - (D) containment action applied immediately
23. Which of the following is the first step for a technician to take when a nonconforming product has been discovered?
- (A) Contact quality management.
 - (B) Determine the product's fitness for use.
 - (C) Quarantine the product.
 - (D) Rework the product.
24. The weakest step in the corrective action process is usually
- (A) finding the problem
 - (B) containing the problem
 - (C) developing an action plan
 - (D) following up on the problem
25. When dial indicators are used, the most common cause of cosine error is the result of the
- (A) operator viewing the dial at an angle
 - (B) operator not counting the number of revolutions the dial has made
 - (C) indicator tip being at an angle to the surface being measured
 - (D) indicator not being referenced to a calibrated surface
26. The accuracy of a profilometer is verified with
- (A) fingernail comparators
 - (B) surface plates
 - (C) calibration patches
 - (D) optical flats
27. In a team meeting, the primary responsibility of the facilitator is to
- (A) record key topics
 - (B) post ideas on a flipchart
 - (C) keep the meeting focused
 - (D) keep track of time

CQT-SAMPLE EXAM

28. Which of the following is the best definition of a flow chart?
- (A) A diagram used to structure ideas into useful categories
 - (B) An illustration used to analyze variation in a process
 - (C) A picture used to separate steps of a process in sequential order
 - (D) An analytical tool used to clarify opposing aspects of a desired change
29. What is the standard deviation of the population below?
- 10, 4, 16, 12, 8
- (A) 4.00
 - (B) 4.47
 - (C) 16.00
 - (D) 20.00
30. The ability of a material to resist mechanical penetration is a test of
- (A) surface finish
 - (B) hardness
 - (C) tensile strength
 - (D) porosity
31. Which of the following elements of an audit program must be aligned with the organization's overall strategy?
- (A) Objectives
 - (B) Schedule
 - (C) Scope
 - (D) Compliance
32. Which of the following types of micrometers is best for detecting external out-of-roundness on a cylindrical part?
- (A) Blade
 - (B) Three-point
 - (C) V-anvil
 - (D) Depth
33. Tolerances are specified for machined parts for which of the following reasons?
- (A) The process used to produce the parts needs improvement.
 - (B) The machines used to produce the parts have inherent variation.
 - (C) The tolerances establish productivity measures.
 - (D) The tolerances identify areas of improvement for the machines.
34. The extent to which an instrument replicates its result when measurements are taken repeatedly on the same unit is called
- (A) real bias
 - (B) precision
 - (C) accuracy
 - (D) true value
35. In a normal distribution, what percentage of data falls within $\pm 3\sigma$ of the mean?
- (A) 95.46%
 - (B) 99.73%
 - (C) 99.96%
 - (D) 100.00%
36. Which of the following tools would be best for measuring projected surface intersections?
- (A) Optical comparator
 - (B) Thread micrometer
 - (C) Profilometer
 - (D) Protractor

37. The check standards used in performing gage calibrations must be

- (A) traceable to national standards
- (B) used in a controlled environment
- (C) labeled to reflect their tolerance
- (D) applied with tamper-proof seals

38. Which of the following groups is responsible for producing parts to specifications?

- (A) The manufacturing engineering department
- (B) The process engineering department
- (C) The manufacturing department
- (D) The quality assurance department

39. When applied to size features such as hole and shaft diameters, MMC refers to

- (A) maximum shaft diameter, maximum hole diameter
- (B) minimum shaft diameter, minimum hole diameter
- (C) maximum shaft diameter, minimum hole diameter
- (D) minimum shaft diameter, maximum hole diameter

40.

	1	2	3	4	5	6	7
SAMPLES	3	2	1	-1	3	2	3
	1	3	3	-1	2	1	2
	-1	0	2	2	-1	1	1
	2	-2	1	1	2	-1	3
	-1	4	1	0	2	0	3

On the basis of the control chart sample above, what is the upper control limit (UCL) for the average?

- (A) 1.23
- (B) 3.21
- (C) 3.43
- (D) 7.25

41. Which of the following measures is a sufficient statistic for the parameter μ ?

- (A) Median
- (B) Mid-range
- (C) Mean
- (D) Mode

42. A process audit is best described as

- (A) a detailed examination of a finished product
- (B) an examination of an activity to verify conformance to established procedures
- (C) an examination of the management methods used in a company
- (D) an independent evaluation of various aspects of part performance

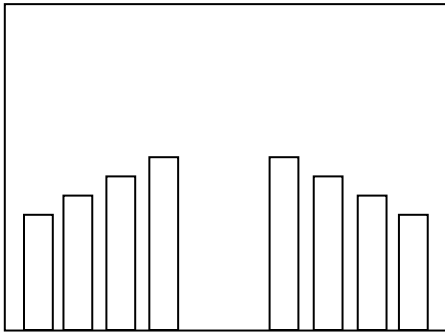
43. If a multi-range instrument is found to be inaccurate on one range, the instrument may be used only if

- (A) it is approved by the customer for all ranges
- (B) it is prominently labeled to indicate its use restrictions
- (C) quality assurance personnel supervise its use
- (D) detailed training is given on its limited use

44. What is the recommended minimum number of subgroups necessary to calculate the limits for a control chart?

- (A) 10
- (B) 15
- (C) 25
- (D) 35

45.



The distribution above most likely implies that the elements measured represent

- (A) the extremes of a single process
- (B) a collection of two processes with normal distributions
- (C) random variations
- (D) the modes of a single process

46. Which of the following describes the Deming method for continuous improvement?

- (A) Cost of quality analysis
- (B) Process map
- (C) Tree diagram
- (D) Plan-do-check-act cycle

47. A population is best described as a

- (A) large group from which a random sample is taken
- (B) small group from which a predetermined sample is taken
- (C) limited number of measurements taken at random from a large source
- (D) limited number of measurements taken from a predetermined small source

48. Which of the following is the formula for calculating the number of permutations of x units taken y at a time?

(A) $\frac{x!}{(x-y)!}$

(B) $\frac{(x-y)!}{x-y}$

(C) $\frac{x!}{y!(x-y)!}$

(D) $\frac{(x-y)!}{(x)y!}$

49. Under which of the following circumstances can the calibration interval of a gage be lengthened?

- (A) No defective parts were produced that were checked with the gage.
- (B) The production rate of the parts checked with the gage increases.
- (C) The inspection department requests the change in writing.
- (D) History indicates satisfactory calibration performance.

50. Which of the following tools can only be used to collect attributes data?

- (A) Dial indicator
- (B) Ring gage
- (C) Micrometer
- (D) Steel scale

STOP.

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY GO BACK AND CHECK YOUR WORK ON THIS TEST.

APPENDIX A: Answer Sheet

For each sample test question, the correct answer is provided below along with the area of the body of knowledge (BOK) that the item is classified to. This sample examination is not intended to represent all areas of the BOK but to provide a sampling from each major topic area. All ASQ examinations are based on the BOK for that particular exam. To view the BOK for CQT, please go to <http://www.asq.org/certification/quality-technician/bok.html>

Question	BOK	Correct Answer
1	IV.D.2	A
2	IV.B.3	D
3	III.A.8	A
4	V.B.1	C
5	I.A.7	B
6	IV.B.9	D
7	II.B.4	C
8	III.C.1	A
9	II.B.4	D
10	I.B.1	C
11	II.C.3	C
12	II.A.2	C
13	IV.E.2	A
14	IV.A.1	C
15	II.A.1	C
16	II.B.5	A
17	IV.B.3	B
18	II.B.5	C
19	IV.B.6	D
20	IV.B.6	A
21	VI.A.	D
22	VI.A.	C
23	IV.E.1	C
24	VI.A.	D
25	IV.B.7	C

Question	BOK	Correct Answer
26	III.A.9	C
27	I.C.2	C
28	I.B.2	C
29	II.B.2	A
30	III.A.7	B
31	V.B.3	A
32	III.A.1	C
33	IV.A.2	B
34	IV.B.3	B
35	II.A.2	B
36	III.A.3	A
37	III.B.1	A
38	I.A.2	C
39	IV.A.2	C
40	II.C.2	B
41	II.B.1	C
42	V.A.3	B
43	III.B.2	B
44	II.C.4	C
45	I.B.7	A
46	I.A.7	D
47	II.A.1	A
48	II.B.5	A
49	III.C.1	D
50	III.A.2	B

APPENDIX B: Analyzing Body of Knowledge (BOK) Content

The following worksheet can be used to help you analyze the results of your answers on this sample examination. It can be used to determine which areas of the body of knowledge (BOK) you may want to study.

After learning which sample test questions you had correct, total the number you had correct and enter that number into the 2nd column of the worksheet. The 3rd column provides the total number of test questions that are in this sample examination for that major area of the BOK. The last column provides the total number of test questions that appear in a formal ASQ examination for that area of the BOK.

BOK Topic Area	Total You Had Correct on Sample Exam	Total in the Sample Exam	Total in Formal ASQ Exam
I. Quality Concepts and Tools		7	20
II. Statistical Techniques		14	21
III. Metrology and Calibration		11	19
IV. Inspection and Test		10	21
V. Quality Audits		3	9
VI. Preventive and Corrective Action		5	10
GRAND TOTAL		50	100