



Vendor: ASQ

Exam Code: CRE

Exam Name: Reliability Engineer Certification (CRE)

Version: DEMO

QUESTION 1

Probability ratio sequential tests are used for products designed to operate for a long period of time.

This test is primarily based on:

- A. The ratio of an acceptable MTBF to an unacceptable MTBF.
- B. Accept regions versus reject regions.
- C. Type I versus type II errors.
- D. Truncation of test results.

Answer: A

QUESTION 2

The reliability of a device comprised of various parts functioning in series is the:

- A. Product of the reliability.
- B. Sum of the probabilities of the unreliability.
- C. Product of the unreliability
- D. Sum of the reliability.

Answer: A

QUESTION 3

The maintenance action rate (MAR) may be mandated by contract. If an extruder is run continuously and experiences 24 maintenance actions (downtown) in one year, what is the MAR?

- A. 0.0054 actions/hr.
- B. 0.0417 actions/hr
- C. 0.0027 acions/hr.
- D. 0.00135 actions/hr.

Answer: C

QUESTION 4

Which of the following is the key component in continuously providing a reliable product?

- A. Improve supplier acceptance testing.
- B. Adequately train the work force.
- C. Reduce product variability.
- D. Scheduled equipment maintenance actions.

Answer: C

QUESTION 5

When requesting "worst case" design analysis, you expect the reliability group to:

- A. Analyze the worst rejects.
- B. Analyze only those products failing to meet specification requirements.
- C. Determine whether product requirements can be met with subassemblies assumed at

their worst combination of tolerances.

D. Assume all subassembly tolerances are at their maximum limit.

Answer: C

QUESTION 6

An employee is injured on the job. The employer has proven to have a good safety and health program. Generally the employee has which of the following options available to him/her?

- A. Contributory negligence.
- B. Caveat emptor.
- C. Workman's compensation.
- D. Caveat venditor.

Answer: C

QUESTION 7

The two principal measures of failure during risk assessment are which of the following?

- A. Failure severity and failure probability.
- B. Failure analysis and failure effects.
- C. Failure method and failure mode.
- D. Failure mode and failure mechanism.

Answer: A

QUESTION 8

What is the minimum number of failure free trips that one must make in their car to be at least 95% confident it is 95% reliable?

- A. 22
- B. 45
- C. 58
- D. 102

Answer: C

QUESTION 9

Of the following, which is the MOST important reliability principle?

- A. Use only proven designs.
- B. Specify only high reliability components.
- C. Consider reliability early in the design phase.
- D. Use redundancy throughout the design.

Answer: C

QUESTION 10

To which of the following types of systems is the concept mean-time-between-failures LEAST applicable?

- A. Power generator.
- B. Rocket motor.
- C. Radar set.
- D. Automobile.

Answer: B

QUESTION 11

Using complete field-based data, a reliability engineer has analyzed the reliability growth of a repairable system over the last 24 months. The analysis suggests a "no growth" condition, and that finding is reported to management.

Due to a pending multimillion dollar order, management requests that a line be drawn to show growth where none actually exists. The engineer's department manager directs the engineer to comply with management request.

According to the ASQ Code of Ethics, which of the following is an appropriate action for the engineer to take next?

- A. Initiate new product reliability growth tests.
- B. Request a meeting with a representative from Occupational Safety and Hazard Administration (OSHA)
- C. Advise management of the consequences to expect if the engineer's professional judgement is overruled.
- D. Ask the department manager for support in presenting the original data to upper management in a more convincing way.

Answer: C

QUESTION 12

A satellite has two redundant control systems, each has a failure rate (λ) = 1×10^{-6} failures/hour. If one of the systems fails, the failure rate for the remaining system increases to 2×10^{-5} failures/hour. What is the reliability of the redundant control systems at 175,000 hours?

- A. 0.8609
- B. 0.7796
- C. 0.690
- D. 0.2507

Answer: B

QUESTION 13

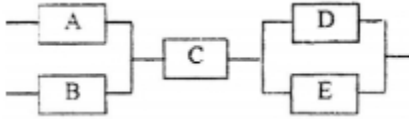
The variations which the normal distribution curve describes are due to:

- A. Non assignable causes.
- B. Catastrophic failure
- C. Assignable causes
- D. Degradation failure.

Answer: A

QUESTION 14

The following reliability block diagram shows components A, B, C, D and E with reliability R_a , R_b , R_c , R_d and R_e , respectively. A or B are system entry points.



On the basis of this information, what is the reliability of the system?

- A. $[1 - (1 - R_a R_b)] R_c [1 - (1 - R_d R_e)]$
- B. $R_a R_c [1 - (1 - R_d R_e)] + (1 - R_a) R_b R_c [1 - (1 - R_d) (1 - R_e)]$
- C. $R_a R_b [1 - (1 - R_d) (1 - R_e)] R_c (1 - R_a) R_b [1 - (1 - R_d) (1 - R_e)]$
- D. $R_a R_c [1 - (1 - R_d) (1 - R_e)] + (1 - R_a) R_b R_c [1 - (1 - R_d) (1 - R_e)]$

Answer: D

QUESTION 15

For complex electronics systems, the major contributor to repair time is generally:

- A. Final checkout.
- B. Disassembly/reassembly.
- C. Remove/replace.
- D. Diagnosis.

Answer: D

QUESTION 16

Which of the following techniques is MOST beneficial in tracking a process to determine whether corrective action should be taken?

- A. Pareto analysis.
- B. Control charting.
- C. Trend analysis.
- D. Time series plotting.

Answer: B

QUESTION 17

An engineer must design a product with a probability of success 99%. Assume that both the strength and stress are normally distributed and that the standard deviations are the same. If the stress is known to be 3000 lbs with a standard deviation of 100 lbs, what must be the approximate designed strength?

- A. 4020 lbs.
- B. 3730 lbs.

- C. 3330 lbs.
- D. 3100 lbs.

Answer: C

QUESTION 18

An off road trip is contemplated using a utility vehicle equipped with five tires. The probability of failure for each tire on this trip follows the binomial distribution and is estimated to be 0.5. What is the probability that the trip can be completed successfully with the five available tires?

- A. 0.0625
- B. 0.5000
- C. 0.3125
- D. 0.1875

Answer: D

QUESTION 19

An aggregate preventive maintenance program can greatly increase the overall availability of a system because of the

- A. Ability to improve observed reliability.
- B. Ability to improve product safety.
- C. Improved control of inventory levels.
- D. Emphasis on budgeting operational expenses.

Answer: A

QUESTION 20

Concurrent engineering means

- A. Alternate designs being generated in parallel.
- B. Engineers working in tandem shifts to speed the process.
- C. An electrical engineering term.
- D. Use of inputs from all technical disciplines early and simultaneously.

Answer: D

QUESTION 21

For single-failure modes, the probability plotting methods used to derive time-to-failure distribution parameters are applicable only when the data are

- A. Gathered for repairable systems.
- B. Independently and normally distributed.
- C. Independently and identically distributed.
- D. Exponentially distributed.

Answer: C

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