

# Quiz 4

Only one answer is correct. 7 correct answers to pass.

\* Required

1. ID \*

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2. What is a repairable system? \*

Mark only one oval.

- A system that has a perfect repair
- A system that has only one random continuous variable T
- Only a hardware system
- A system that has a reparation process
- A system that has only one failure

3. What is the goal of reliability?

\* Mark only one oval.

- $E[X_{\{i+1\}}] = E[X_{\{i\}}]$
- $E[X_{\{i+1\}}] \geq E[X_{\{i\}}]$
- $E[X_{\{i+1\}}] \leq E[X_{\{i\}}]$
- $E[X_{\{i+1\}}] = 0$

4. What is a Markov process? \*

Mark only one oval.

- A stochastic process for which the probability of the future is conditioned by the whole history
- A stochastic process for which the probability of the future is the probability of the present
- A stochastic process for which the probability of the future is the sum of the probabilities of the history
- A stochastic process for which the probability of the future is conditioned by the present only
- A stochastic process for which the probability of the future is not conditioned

5. **The probability of two working components to become failing the next step is \***

*Mark only one oval.*

- Probability of 2 successes in 2 trials
- Probability of 0 successes in 2 trials
- Probability of 1 success in 2 trials
- Probability of 2 successes in 1 trial
- Probability of 1 successes in 1 trial

6. **Which of the following statements is true? \***

*Mark only one oval.*

- $P_{\{0,3\}} = P\{X(0)=3\}$
- $P_{\{0,3\}} = P\{X(3)=0\}$
- $P_{\{0,3\}} = P\{X(1)=3 \mid X(0)=0\}$
- $P_{\{0,3\}} = P\{X(0)=3\} / P\{X(3)=0\}$
- $P_{\{0,3\}} = P\{X(0)=3\} + P\{X(3)=0\}$

7. **Can a software system have i.i.d. pdfs? \***

*Mark only one oval.*

- No, in general, as a software system is non-repairable
- No, not in general, as there might be multiple failures at the same instant of time
- Yes, in general, as the reparation process resets the system as good as new
- Yes, in general, as the reparation process resets the system as bad as old
- No, not in general, as developers may inject faults between the occurrence of two failures

8. **If the hazard rate is constant =  $\lambda$  what is the expected mean of Time of Failure ? \***

*Mark only one oval.*

- exp
- $\exp(-\lambda t)$
- $\lambda t$
- $1/\lambda$
- $\log(-\lambda t)$

9. **Why a uniform (constant) pdf  $f(t)$  cannot model the time of failure of a non-repairable software system? \***

*Mark only one oval.*

- Because there is at least one failure that occurs outside the given time window
- Because it does not include the time of fixing the failure in the given time window
- Because it is not i.i.d.
- Because there is at least one instant of time at which the reliability function is infinite
- Because the Expected Time of Failure is constant in the domain of definition

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