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**Estado** Teste enviado

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**Tempo gasto** 31 minutos 31 segundos

## Pergunta 1

Incorreto

Pontuação 0,666

Destacar pergunta

In Distributed Systems, a Closure Mechanism:

Selecione uma opção de resposta:

- ☐ a. Allows one to obtain a context for a name resolution.
- ☒ b. No answer. ✖
- ☐ c. Orderly closes the used resources without leaking.
- ☐ d. Binds the scope variables to a local function.
- ☐ e. All other answers are right.

A resposta correta é: Allows one to obtain a context for a name resolution.

## Pergunta 2

Correto

Pontuação 0,666

Destacar pergunta

Which of the following **do not** apply? In a distributed system:

Selecione uma opção de resposta:

- ☐ a. Correctness must be ensured even in the presence of faults.
- ☐ b. There is no single physical clock.
- ☒ c. System's global state is well known. ✔
- ☐ d. No answer.
- ☐ e. The system can use only information locally available.

A resposta correta é: System's global state is well known.

## Pergunta 3

Incorreto

Pontuação 0,666

Destacar pergunta

Which of the following **does not** apply? In Event-based Concurrency:

Selecione uma opção de resposta:

- ☐ a. The structure of the code is very similar from that of the iterative server.
- ☐ b. The programmer needs to break processing according to potentially blocking calls.
- ☐ c. The programmer needs to manage the state explicitly, rather than relying on the stack.
- ☐ d. No answer.
- ☒ e. No nasty errors like race conditions, which may be elusive. ❌

A resposta correta é: The structure of the code is very similar from that of the iterative server.

## Pergunta 4

Correto

Pontuação 0,666

🚩 Destacar pergunta

Consider a system with a 0.9 probability of working correctly, and a MTTF of 100h:

Selecione uma opção de resposta:

- ☐ a. There is not enough information to determine MTTR.
- ☒ b. MTTR = 11.(1)h ✅
- ☐ c. MTTR = 0.1
- ☐ d. MTTR = 900h
- ☐ e. Not answering.

A resposta correta é: MTTR = 11.(1)h

## Pergunta 5

Incorreto

Pontuação 0,666

🚩 Destacar pergunta

Which of the following **does not** apply? The desired properties of an hashing function ( $h$ ) are:

Selecione uma opção de resposta:

- ☐ a. No answer.
- ☐ b. Compression, which maps an arbitrary length input into a fixed-size hashing value.
- ☐ c. All other answers are right (and this answer is not a paradox).
- ☒ d. High collision tolerance, where it is computationally inviable to find two value  $x$  and  $x'$ , such that  $x \neq x'$  and  $h(x) = h(x')$ . ❌
- ☐ e. One-way, where given an hashing value, it is computationally simple to solve for  $x$ , such that  $y = h(x)$ .

A resposta correta é: One-way, where given an hashing value, it is computationally simple to solve for  $x$ , such that  $y = h(x)$ .

Seguinte ►

## NAVEGAÇÃO NO TESTE



Pedro Miguel Vieira da Silva

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Nome de utilizador: Pedro Miguel Vieira da Silva (Sair)

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## Pergunta 6

Correto

Pontuação 0,666

Destacar pergunta

Which RPC Fault semantics becomes non-trivial to implement if the underlying transport protocol is not reliable.

Selecione uma opção de resposta:

- ☐ a. Exactly-once.
- ☐ b. May-be.
- ☒ c. At-most-once. ✓
- ☐ d. Not answering.
- ☐ e. At-least-once.

A resposta correta é: At-most-once.

## Pergunta 7

Correto

Pontuação 0,666

Destacar pergunta

RSA's security power is directly related to:

Selecione uma opção de resposta:

- ☐ a. Its level of compression.
- ☐ b. Not answering.
- ☒ c. Determining the factors of large numbers. ✓
- ☐ d. Different keys for encryption/decryption.
- ☐ e. The base numbers being prime.

A resposta correta é: Determining the factors of large numbers.

## Pergunta 8

Correto

Pontuação 0,666

Destacar pergunta

One of the main reasons to choose UDP over TCP is:

Selecione uma opção de resposta:

- ☐ a. UDP provides higher reliability, due to its maximum packet size limit.
- ☐ b. UDP Messages are better than TCP streams.

- ☐ c. Being connectionless, UDP is easier to implement.
- ☐ d. Not answering.
- ☒ e. It is preferable to have loss of packets instead of delay of packets. ✓

A resposta correta é: It is preferable to have loss of packets instead of delay of packets.

## Pergunta 9

Correto

Pontuação 0,666

🚩 Destacar pergunta

Regarding UDP, which of the following sentence is INCORRECT?

Selecione uma opção de resposta:

- ☐ a. A receiver may be flooded with requests and run out of resources to receive other messages.
- ☐ b. Not answering.
- ☒ c. UDP packets may be lost, but never duplicated. ✓
- ☐ d. A process can start transmitting data immediately.
- ☐ e. Datagrams have a maximum size of 65535 bytes.

A resposta correta é: UDP packets may be lost, but never duplicated.

## Pergunta 10

Incorreto

Pontuação 0,666

🚩 Destacar pergunta

Which of the following is **wrong**? According to RPC Semantics:

Selecione uma opção de resposta:

- ☐ a. No answer.
- ☐ b. Exactly-once: The receiver should ensure it doesn't process the same request two times or more, but it can't choose not to process it.
- ☐ c. At-least-once: The client stub must keep retransmitting until it obtains a response.
- ☒ d. At-most-once: The receiver should ensure it doesn't process the same request two times or more. ✗
- ☐ e. May-be: The request may be executed once (or more times).

A resposta correta é: May-be: The request may be executed once (or more times).

Seguinte ►

## Pergunta 11

Correto

Pontuação 0,666

Destacar pergunta

Which of the following is **wrong**? In the Synod Algorithm:

Selecione uma opção de resposta:

- ☐ a. A Proposal is a pair  $(n, v)$ , where  $n$  is a unique number (a proposal identifier) and  $v$  is some value from  $V$ .
- ☐ b. A value is chosen if a majority of acceptors accept a proposal with a given value.
- ☐ c. In the first phase, it selects a proposal number  $n$  and sends a  $PREPARE(n)$  request to a majority of acceptors.
- ☐ d. No answer.
- ☒ e. In the second phase, if an acceptor receives an  $ACCEPT$  request for a proposal numbered  $n$ , it accepts the proposal regardless. ✓

A resposta correta é: In the second phase, if an acceptor receives an  $ACCEPT$  request for a proposal numbered  $n$ , it accepts the proposal regardless.

## Pergunta 12

Correto

Pontuação 0,666

Destacar pergunta

In Leader Election, one of the following assumptions is **INCORRECT**. Which?

Selecione uma opção de resposta:

- ☒ a. A leader dictates who is his successor, only within its group. ✓
- ☐ b. All nodes need to learn who is the leader.
- ☐ c. Not answering.
- ☐ d. Leader failure must be properly dealt with.
- ☐ e. Fairness is not important.

A resposta correta é: A leader dictates who is his successor, only within its group.

## Pergunta 13

Incorreto

Pontuação 0,666

Destacar pergunta

Three-Phase Commit is different from Two-Phase Commit, because...

Selecione uma opção de resposta:

- ☐ a. Not answering.
- ☐ b. No process can commit while another is in an uncertain state.
- ☒ c. It ensures the non-blocking condition, even if there is no majority. ✖
- ☐ d. There is no need for timeout/recovery actions.
- ☐ e. No process will ever be on an uncertain state.

A resposta correta é: No process can commit while another is in an uncertain state.

## Pergunta 14

Incorreto

Pontuação 0,666

🚩 Destacar pergunta

In a DHT Chord, when a successor fails, a specific node can:

Selecione uma opção de resposta:

- ☐ a. Trigger an election algorithm to appoint a new successor.
- ☐ b. Assign its predecessor, as its new successor.
- ☐ c. Replace it with another, from a list of successors.
- ☐ d. Not answering.
- ☒ e. Send a message to the next node in the ring to ask for a new successor. ✖

A resposta correta é: Replace it with another, from a list of successors.

## Pergunta 15

Correto

Pontuação 0,666

🚩 Destacar pergunta

In the context of fault-tolerance, if a system A is more reliable than a system B, then:

Selecione uma opção de resposta:

- ☐ a. A system A must be more available than system B.
- ☐ b. Not answering.
- ☐ c. A system A must be less available than system B.
- ☒ d. A system A can be less available than system B. ✔

A resposta correta é: A system A can be less available than system B.

Seguinte ►

## Pergunta 16

Incorreto

Pontuação 0,666

Destacar pergunta

When one wants to disseminate information by the nodes (replicas) of a distributed system:

Selecione uma opção de resposta:

- ☐ a. All other answers are right.
- ☐ b. No answer.
- ☒ c. One can use an Anti-Entropy strategy, where each replica periodically chooses at random another replica to exchange updates. ✖
- ☐ d. It is assumed there are no conflicts between nodes.
- ☐ e. One can use a Gossiping strategy, where a replica that was updated passes it on to other replicas.

A resposta correta é: All other answers are right.

## Pergunta 17

Incorreto

Pontuação 0,666

Destacar pergunta

In a Banana Tree Protocol (BTP), if a node fails...

Selecione uma opção de resposta:

- ☐ a. The tree waits for a timeout and, if the node doesn't recover, all its children become children of the node's root.
- ☐ b. If the node is the root, then a random child is appointed the new root and holds the remaining children.
- ☐ c. The tree of which it is root, partitions, and its children become children of the root.
- ☐ d. Not answering.
- ☒ e. Its children request permission to become children of the node's root. ✖

A resposta correta é: The tree of which it is root, partitions, and its children become children of the root.

## Pergunta 18

Incorreto

Pontuação 0,666

Destacar pergunta

Consider protocols such as 2PC. What should happen if, upon reading a block from a stable storage, disk 1 gives a bad checksum?



Selecione uma opção de resposta:

- ☒ a. Halt as a catastrophic failure, since there is no reconciliation possible with disk 2. ✖
- ☐ b. Request that block from another peer, and compare it with disk 2.
- ☐ c. Read from disk 2. If the checksum is good, copy the block over to disk 1, and only then proceed.
- ☐ d. Not answering.
- ☐ e. Read from disk 2. If the checksum is good, one may proceed.

A resposta correta é: Read from disk 2. If the checksum is good, copy the block over to disk 1, and only then proceed.

## Pergunta 19

Correto

Pontuação 0,666

🚩 Destacar pergunta

In the Two-Phase Commit protocol, failure of communication is a concern that is, in practice, detected using:

Selecione uma opção de resposta:

- ☐ a. Not answering.
- ☒ b. timeouts. ✔
- ☐ c. non-blocking.
- ☐ d. redundancy.
- ☐ e. stable storage.

A resposta correta é: timeouts.

## Pergunta 20

Incorreto

Pontuação 0,666

🚩 Destacar pergunta

In a Distributed HashTable (DHT), which of the following sentences **is wrong**:

Selecione uma opção de resposta:

- ☐ a. Node identifiers and key values are drawn from the same domain.
- ☐ b. In a Chord, if each node  $n$  keeps information about all nodes in the ring, the name resolution time becomes quadratic.
- ☒ c. Depending on the definition of distance, we get different DHTs. ✖
- ☐ d. In a Chord, the node responsible for key  $k$  is the successor of key  $k$ .
- ☐ e. Not answering.

A resposta correta é: In a Chord, if each node  $n$  keeps information about all nodes in the ring, the name resolution time becomes quadratic.

Seguinte ►

## NAVEGAÇÃO NO TESTE



Pedro Miguel Vieira da Silva

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## Pergunta 21

Incorreto

Pontuação 0,666

Destacar pergunta

Which of the following **do not** apply? When using replication and caches:

Selecione uma opção de resposta:

- ☒ a. All other answers are right (and this answer is not a paradox). ✖
- ☐ b. No answer.
- ☐ c. Distributed processing is achievable.
- ☐ d. Communication latency is reduced.
- ☐ e. Consistency problems are a non-issue.

A resposta correta é: Consistency problems are a non-issue.

## Pergunta 22

Correto

Pontuação 0,666

Destacar pergunta

In the Synod Algorithm, once a value has been chosen, if a proposer gets a response to its PREPARE message, from a majority, then the chosen value will be...

Selecione uma opção de resposta:

- ☐ a. on any response after that, because they will all have the chosen value.
- ☒ b. on the highest numbered proposal response it receives. ✔
- ☐ c. on the next response with the highest value.
- ☐ d. on the first proposal it receives after the PREPARE message.
- ☐ e. Not answering.

A resposta correta é: on the highest numbered proposal response it receives.

## Pergunta 23

Correto

Pontuação 0,666

Destacar pergunta

Whenever we use HTTP-Cookies, we are in a presence of:

Selecione uma opção de resposta:

- ☐ a. Not answering.
- ☐ b. Both protocol and server are stateless.

- ☐ c. Both protocol and server are stateful.
- ☒ d. A stateless protocol and a stateful server. ✓
- ☐ e. A stateful protocol and a stateless server.

A resposta correta é: A stateless protocol and a stateful server.

## Pergunta 24

Correto

Pontuação 0,666

🚩 Destacar pergunta

You should choose to implement an Event-based Server when:

Selecione uma opção de resposta:

- ☐ a. Not answering.
- ☐ b. You want better performance than Thread-based servers.
- ☐ c. You must handle concurrency explicitly.
- ☐ d. You need to virtualize your resources.
- ☒ e. Parallelism is paramount. ✓

A resposta correta é: Parallelism is paramount.

## Pergunta 25

Incorreto

Pontuação 0,666

🚩 Destacar pergunta

Regarding SSL/TLS communication channels, which of the following statement is **FALSE**?

Selecione uma opção de resposta:

- ☒ a. Not answering. ✗
- ☐ b. It is implemented on an application layer, protecting its objects.
- ☐ c. Forged TCP messages are a threat.
- ☐ d. Acts on the transport layer, requiring socket-based modification on applications.
- ☐ e. It is vulnerable to DoS attacks.

A resposta correta é: It is implemented on an application layer, protecting its objects.

Seguinte ►



## Pergunta 26

Correto

Pontuação 0,666



Destacar pergunta

The definition of “Security” tries to uphold and ensure the following aspects, in terms of “data”:

Selecione uma opção de resposta:

- ☐ a. Authenticity, Authorization and Trust.
- ☐ b. Availability, Trust and Authentication.
- ☐ c. Not answering.
- ☐ d. Assurance, Integrity and Confidentiality.
- ☒ e. Integrity, Confidentiality and Availability. ✓

A resposta correta é: Integrity, Confidentiality and Availability.

## Pergunta 27

Correto

Pontuação 0,666



Destacar pergunta

Which of the following **do not** apply? When using flow control mechanisms:

Selecione uma opção de resposta:

- ☐ a. Messages should not be lost, but paced.
- ☐ b. No answer.
- ☐ c. A slow receiver should not be flooded by messages sent by a fast sender.
- ☒ d. Computing power of a fast sender is greater than that of the receiver. ✓
- ☐ e. All other answers are right (and this answer is not a paradox).

A resposta correta é: Computing power of a fast sender is greater than that of the receiver.

## Pergunta 28

Incorreto

Pontuação 0,666



Destacar pergunta

Consider a Garcia-Molina’s Algorithm. Which of the following sentences **does not stand** as a premise:

Selecione uma opção de resposta:

- ☒ a. There are no transmission errors. ✗
- ☐ b. No message may be lost.

- ☐ c. When a node fails, it immediately halts all processing.
- ☐ d. Messages are delivered in the order in which they are sent.
- ☐ e. Not answering.

A resposta correta é: No message may be lost.

## Pergunta 29

Incorreto

Pontuação 0,666

🚩 Destacar pergunta

In the context of a Distributed HashTable (DHT), consider the strategy where in addition to a pointer to the next node in the ring, each node keeps a pointer that allows it to reduce at least in half the distance to the key. Which of the following sentences **is not a property** of this scheme:

Selecione uma opção de resposta:

- ☐ a. Each node knows more about nodes closer to it than nodes further away.
- ☒ b. The table in a node may not have information on the  $succ(k)$ , for some  $k$ , which means that a node may be unable to resolve a key by itself. ✖
- ☐ c. Not answering.
- ☐ d. Key resolution requires  $O(n)$  steps.
- ☐ e. Each node keeps information on only  $m$  nodes, not all.

A resposta correta é: Key resolution requires  $O(n)$  steps.

## Pergunta 30

Incorreto

Pontuação 0,666

🚩 Destacar pergunta

Which of the following is **wrong**? In a 3PC:

Selecione uma opção de resposta:

- ☐ a. It can be shown that the PRECOMMIT states are necessary and sufficient to prevent blocking regardless of the situation.
- ☐ b. No answer.
- ☐ c. The PRECOMMIT states ensure the non-blocking condition.
- ☐ d. No process can commit while another process is in an uncertain state (INIT, WAIT, READY), i.e. can decide either way.
- ☒ e. A new phase between the 2 phases of the 2PC protocol is added, in which the coordinator reveals its intention to COMMIT. ✖

A resposta correta é: It can be shown that the PRECOMMIT states are necessary and sufficient to prevent blocking regardless of the situation.

Terminar revisão

## NAVEGAÇÃO NO TESTE



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