Which of the following statements about transactions and concurrency control are correct? Select correct statement(s).



In order to recover from an aborting transaction, a transaction must not commit if it has done a dirty read from a transaction that subsequently aborted.

- In optimistic concurrent control, backward validation checks a write set of the transaction undergoing validation with read sets of other later transactions, which are still active.
- To prevent cascading aborts, a transaction must suspend its commit operation if it has performed a dirty read.



In concurrent control based on timestamp ordering, a read operation of a current transaction T_c does conflict with previous write operations done by other transactions, T_i , whose timestamps indicate that they should be later than T_c , i.e., $T_i > T_c$

Selected Answer - Incorrect



✓ In concurrent control based on timestamp ordering, a write operation of a current transaction T_c conflicts with previous read and write operations done by other transactions, T_i , whose timestamps indicate that they should be later than T_c , i.e., $T_i > T_c$



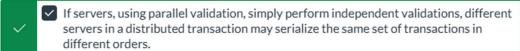
A serially equivalent interleaving is an interleaving of the operations of transactions in which the combined effect is the same as if the transactions had been performed one at a time in some order.

With the strict two-phase locking, a transaction acquires all locks it needs in the first phase (a "growing phase"), and releases the locks in the second phase (a '"shrinking phase") before the transaction commits or aborts.

8/8 points

Which of the following statements about distributed transactions are correct? Select correct statement(s).





When a coordinator has failed, the participants can decide to commit or abort the transaction cooperatively instead of contacting the coordinator. However, if all the participants are in the uncertain state, they will be unable to decide until the coordinator or a participant with the necessary knowledge is available.

In the first phase of the two-phase commit protocol, when a participant receives a "canCommit?" request from the coordinator, the participant first prepares to commit by saving objects in permanent storage and then sends its vote ("Yes" or "No") to the coordinator.

In distributed optimistic transactions, each server applies a parallel validation protocol, an extension of either backward or forward validation to disallow multiple transactions to be in the validation phase on different servers simultaneously.



✓ If transaction *T* is before transaction *U* in their conflicting access to objects at one of the servers, they must be in that order at all of the servers whose objects are accessed in a conflicting manner by both *T* and *U*.

7 2/2 points

We sometimes want to include the behavior of faulty nodes in our requirements and talk about *uniform agreement* for multicast. What do we mean by uniform agreement?

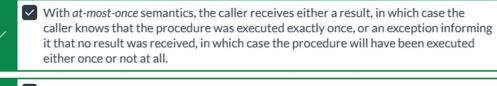
If a node, including faulty, sends a message then it also delivers the message.

If any node, including faulty, deliver a message then all nodes, including faulty, deliver the message.

A node, including faulty, delivers a message at most once and only messages that have been sent



 If any node, including faulty, deliver a message then all correct nodes deliver the message. Which of the following statements about remote invocation techniques for communication in distributed systems are correct? Select correct statement(s)



~	~	On receiving an object reference as an input/output parameter or a return result in a remote method invocation, a process can then access this object using remote method invocation instead of transmitting the object value across the network.

Even if a	a failure ha	s been re	eporte	d, the d	aller kn	ows tha	t the rer	note pro	ocedure	with a	t-least-	
once RP	C semantic	s has be	en exe	cuted	at least o	once.						

Unlike a regular procedure call, a call to a void remote procedure returns as soon as the call
request is sent to the destination computer where the procedure is to be executed.

A non-idempotent operation is an operation that can be performed repeatedly with the same
effect as if it had been performed exactly once.



Each remote procedure call is executed in a separate process (thread) on the server side.

31 2/2 points

In an active replicated server, how do we know that the replicas are in a consistent state?

- a coordinator uses two-phase commit for each request
- the primary replica sends update messages to all other
- they do not change state and are thus by definition consistent



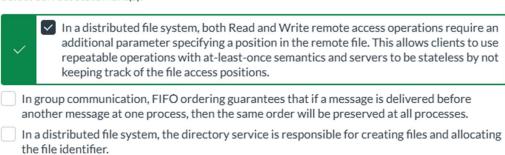
they reliably receive all requests in a total order

Feedback

General Feedback

Section 18.3.2

Select correct statement(s).





Publish-Subscribe is a form of indirect communication that is both time- and spaceuncoupled