Ans1. Total order reliable multicast can be reduced to consensus in presence of faulty processes, a problem known to be impossible to solve in an asynchronous system.

Ans2. Accuracy = No correct process is suspected. Eventual accuracy = no correct process is suspected after a certain time (it is ok to suspect a correct process before that)

Ans3. Due to overlap, the second transaction produces wrong results. No serializable.

Ans4. Alice sends M, d_A(m). Bob retrieves m using e_A(d_A(m)), and checks if m = H(M).

Ans5. Six fingers pointing to: 18, 19, 21, 25, 33, 49. Routing path: 17 → 33 → 41 → 42.

Ans6. (b) Fail-stop will not cause this type of faulty behavior.

Ans7. (d) 100-2 = 98 processes may undergo byzantine failure.

Ans8. (d) 2-phase commit is used to implement atomic transactions.

Ans9. (a) Birthday attack is used to obtain signatures on a fraudulent document.

Ans10. (c) Application is blocked when in phase 2 if a participant does not receive COMMIT/ABORT

Ans11. (c) Satisfies causal but not sequential consistency.

Ans12. (d) The global state rolls back to (p1, q2, r1)

Ans13. (b) It makes cryptanalysis difficult.

Ans14. (d) Distributed snapshot

Ans15. (a) No guarantee that members will receive Bob’s messages in FIFO order. Let a1, a2, a3 be the messages to group A and b1, b2, b3 be the messages to group B. Then for members belonging to A ∩ B, some may receive messages as a1, a2, b1, b2, a3, b3, and some other may receive them as a1, b1, b2, b3, a2, a3. Incidentally (c) will also be correct if messages have unique sequence numbers, since receivers will be able to receive them in the ascending order of sequence numbers. The wording of the question needed some improvement, so no one has been penalized on this.

Distribution of overall grades

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