Design of Distributed Systems

Quiz-3 and Solution
BESE-14 (A&B)

1. **What type of Invocation Semantics is involved in Local Procedure Call? (1)**
   Exact Once

2. **Name the three invocation semantics involved in Remote Procedure Call (1.5)**
   May Be
   At Least Once
   At Most Once

3. **Describe the At-least once invocation semantics scenario. What types of failures can occur in this case.** (3)

   In this scenario, request messages are retransmitted, which masks the omission failures of the invocation or result message. This semantics can suffer from the following type of errors

   - Crash failures when the server containing the remote object fails
   - Arbitrary failures. In cases when the invocation message is retransmitted, the remote object may receive it & execute the method more than once, possibly causing wrong values to be stored & returned

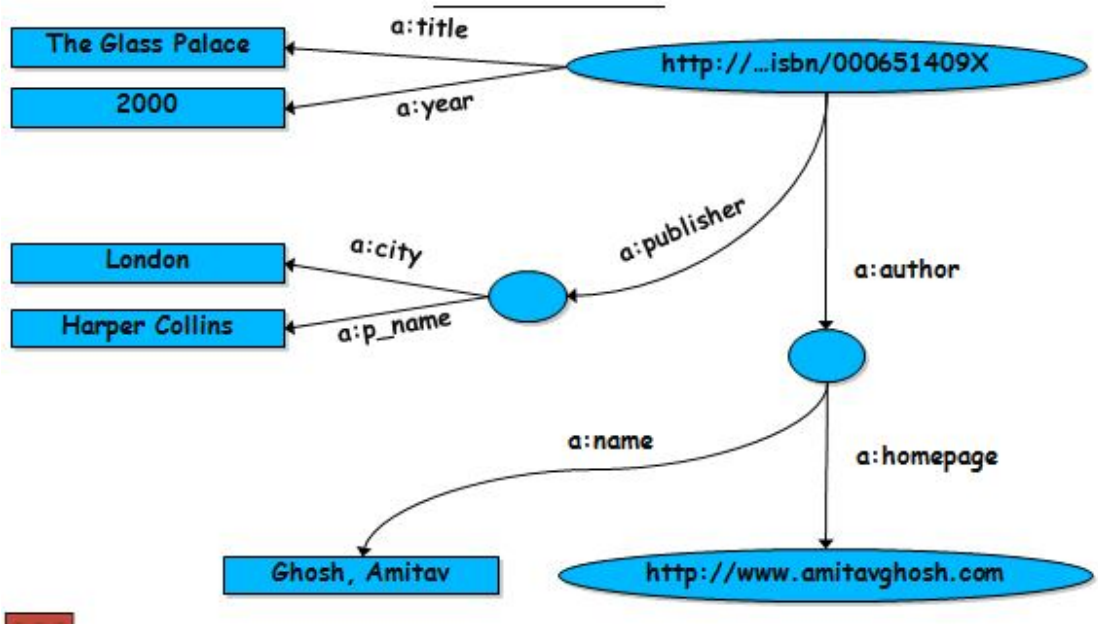
4. **Can Arbitrary Process Failures occur in case of At-Most Once Scenario? Justify your answer using brief description. (2)**

   At-Most Once scenario can be achieved by using all of the fault tolerance measures (retransmission of request, duplicate filtering, and retransmit reply). All three fault tolerance measures make sure that the arbitrary failures will be masked by making sure that an object should execute the method once only (avoiding executing non-idempotent operations)

5. **RMI are more vulnerable to failures as compared to LMI due to involvement of networks, another computers and processes; therefore it is not a wise idea to make RMI completely transparent. What mechanism (technique) is usually employed by designers of RMI to handle this?** (1)

   Objects that are to be implemented for Remote Invocation implement Remote interfaces and throw Remote Exceptions.

6. **Given the following Scenario**



What is name of the publisher of "The Glass Palace" **1.5**

Harper Collins