TP4
Chapter 2: System model

1. Comparison – Centralized, Decentralized and Distributed systems
   - What are they?
   - Characteristics
   - Architecture
   - Advantages and disadvantages
   - Limitation
   - An example and explain

2. What problems do you foresee in the direct coupling between communicating entities that is implicit in remote invocation approaches? Consequently, what advantages do you anticipate from a level of decoupling as offered by space and time uncoupling?

3. Describe and illustrate the client-server architecture of one or more major Internet applications (for example the Web, email or netnews).

4. A search engine is a web server that responds to client requests to search in its stored indexes and (concurrently) runs several web crawler tasks to build and update the indexes. What are the requirements for synchronization between these concurrent activities?

5. The host computers used in peer-to-peer systems are often simply desktop computers in users' offices or homes. What are the implications of this for the availability and security of any shared data objects that they hold and to what extent can any weaknesses be overcome through the use of replication?

6. List the types of local resource that are vulnerable to an attack by an untrusted program that is downloaded from a remote site and run in a local computer.

7. Consider a simple server that carries out client requests without accessing other servers. Explain why it is generally not possible to set a limit on the time taken by such a server to respond to a client request. What would need to be done to make the server able to execute requests within a bounded time? Is this a practical option?

8. The Network Time Protocol service can be used to synchronize computer clocks. Explain why, even with this service, no guaranteed bound is given for the difference between two clocks.

9. Describe possible occurrences of each of the main types of security threat (threats to processes, threats to communication channels, denial of service) that might occur in the Internet.