

Computer Network and Distributed Systems (CoDS) Question 1

Computer Network – An overview

You have to give an overview of computer network.

You have to explain the layered model, protocols, headers and addresses.

You have to describe horizontal and vertical communication.

You *can* describe one or more of the following issues:

Connection oriented vs. Connection less,
reliable vs. unreliable,

Computer Network and Distributed Systems (CoDS) Question 2

Application layer – HTTP

You have to give a short overview of the application layer.

You have to explain the HTTP its purpose, the HTTP-protocol, HTTP request headers, HTTP response headers and the address.

You can describe one or more of the following issues:

Persistent vs. non Persistent,

HTTP content.

Computer Network and Distributed Systems (CoDS) Question 3

Application layer – Domain Name System (DNS)

You have to give a short overview of application layer.

You have to explain the purpose of DNS, the information structure for the logical names including the three levels.

Describe the reason for having multiple name servers instead of only one centralized server.

You *can* describe one or more of the following issues:

Start of Authoritative (SoA)

Recursive or Iterative handling of a request

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Application layer – Peer to Peer (P2P)

You have to give a short overview of the client – server architecture and the webservice (SOA) architecture and give examples of the drawbacks of using client-server architecture for file sharing.

You have to explain the idea of Peer-to-peer architecture and describe the benefits of using P2P for file sharing.

You have to explain the challenge in Peer-to-peer when it is used for file sharing and describe in general some of the solutions for this problem.

Computer Network and Distributed Systems (CoDS) Question 5

Network programming – socket

You have to explain how to make a simple network program.

You must explain how you can make a server program as well as a client program.

You should focus on the important C# classes to make a server and to make a client.

How you are going to use these.

Computer Network and Distributed Systems (CoDS) Question 6

Transport layer – an overview and UDP

You have to give an overview of the transport layer.

You have to explain the purpose of the transport layer and the two transport protocols.

You have to explain the difference between TCP and UDP.

You have to explain the concepts of multiplexing and the header of the UDP.

Computer Network and Distributed Systems (CoDS) Question 7

Transport layer – TCP

You have to give a short overview of the transport layer, its purpose and protocols.
You have to shortly describe the difference between TCP and UDP.

You must explain the TCP and the header, including 3 way handshake, sequence- and acknowledge numbers and congestion control.

Computer Network and Distributed Systems (CoDS) Question 8

Network layer – an overview

You have to give an overview of the network layer.

You have to explain for the network layer the purpose, the protocol and the addresses.

You have to explain the forwarding tables.

You *can* describe the following issues:

Subnet,

Dynamic Host Control Protocol (DHCP),

Network Address Translation (NAT),

routing

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Network layer – Subnets

You have to give a short overview of the network layer and the addresses.

You have to explain what a subnet is and how to do it including how to use subnetmask.

Besides you *can* describe the following issues:

Dynamic Host Control Protocol (DHCP),

Network Address Translation (NAT),

Security.

Computer Network and Distributed Systems (CoDS) Question 10

Security – an overview

You have to give an overview of security in communications.

You have to explain the 4 properties and some of the possible attacks.

You have to explain the basic of cryptography

i.e. Symmetric and asymmetric keys and how they works.

You have to explain following concepts:

- Digital signature,
- Messages Digest,
- Certificate.

Computer Network and Distributed Systems (CoDS) Question 11

Security – secure connections - SSL

You have to **shortly** explain the 4 properties mentioned for secure connections.

You have to describe **very shortly** the first 2 types of secure connections, which are mentioned in “Computer network” chap. 8.5 – 8.6.

You have to describe in detail how SSL is secure how it works and which properties it normally ensure.

Computer Network and Distributed Systems (CoDS) Question 12

Network programming – secure socket

You have to explain **shortly** the need of secure socket and where we have it in the protocol stack (layers).

You have to explain how to make a simple secure network program i.e. how do you make a secure server respective a secure client.