

Communication Networks 2

Exercise 1 - Basics



TECHNISCHE
UNIVERSITÄT
DARMSTADT

Multimedia Communications Lab
TU Darmstadt

Problem 1 Telephone Networks

Which of the following statements are true for telephone networks?

I: Connectionless service

II: Circuit switching is used

III: A dedicated line between caller and callee is maintained

IV: Communication not always follows same path

V: Packets are forwarded from sender to receiver via relay stations

- ☐ (A) I, IV, V
- ☐ (B) I, II, IV
- ☐ (C) II and III
- ☐ (D) II, III, IV
- ☐ (E) III and V

Problem 2 IETF

What does "IETF" stand for?

- ☐ (A) International Engineers Task Force
- ☐ (B) Internet Evil Telephone Formation
- ☐ (C) International Engineering Task Force
- ☐ (D) Internet Engineering Task Force
- ☐ (E) Institute of Electrical Telecommunication Formation

Problem 3 TCP/IP Layer

Which Layer does not belong to the TCP/IP Layer model ?

- ☐ (A) Transport Layer
- ☐ (B) Network Layer
- ☐ (C) Application Layer
- ☐ (D) Session Layer
- ☐ (E) Link Layer

Problem 4 Network Layer

What are functions of the Network Layer?

I: Reliable data transfer between adjacent stations

II: Connection between end systems

III: Connection between applications

IV: Flow control
V: Congestion control
VI: Addressing of stations

- ☐ (A) II, IV, V
☐ (B) III, IV, V
☐ (C) I, II, III
☐ (D) II, V, VI
☐ (E) I, II, VI

Problem 5 Basics of Communication Networks-Morse code

Encode the text Communication Networks using Morse code. How many bits are required for the code?

Problem 6 Basics of Communication Networks-Baudot Code

Encode the text Communication Networks using Baudot code. How many bits are required for the code?

Problem 7 Morse Code vs Baudot Code

What is the fundamental difference between Morse code and Baudot code and how is it related to time multiplexing?

Problem 8 Basics of Communication Networks-Cont.1

Assume that phones are sold pairwise and hard-wired. Assume a scenario with 100 households in which an arbitrarily chosen pair of households shall be able to communicate via telephone. How many phones are required per household? How many lines are required to connect the phones? What is the complexity?

Problem 9 Basics of Communication Networks-Cont.2

Now assume that phones are connected to a central switchboard by which an arbitrarily chosen pair of phones can be connected. How do the numbers change?

Problem 10 Telegraph Networks

What type of switching was used in telegraph networks? What is the difference to switching in today's Internet?

Problem 11 Telegraph Networks-Cont.

What type of switching was used in telegraph networks? What is the difference to switching in today's Internet?

Problem 12 Telephone Networks

Explain how switching in telephone networks changed from the beginning until today.

Problem 13 Television

What kind of medium is television? What is the difference to telephony and telegraphy?

Problem 14 ISO/OSI Model vs TCP/IP Model

What are the fundamental differences between the ISO/OSI model, the TCP/IP model, and the 5-layer model for describing communication networks?

Problem 15 Layer Model Procedure Subjects

What happens with user data as it is transmitted from a sending application to a receiving application? Sketch the procedure subject to the layer models?

Problem 16 Connectionless vs Connection Oriented Services

What is the difference between a connectionless and a connection-oriented service? Which phases are typically distinguished when using a connection-oriented service?