Homework #1

Homework is due by the closing date of the submission box. In order to avoid problems, please submit the homework by the day before the due date. The homework must be submitted as a WORD file. Handwritten parts and screenshots may be included in the file as jpeg images.

Questions about the content framework learned in practice:

1. Identify the IP address of your computer.
   1. IP ADDRESS \_\_\_\_\_\_\_\_\_\_\_\_.
   2. Explain how you obtained the address, (what is the command, and in what environment), an explanation accompanied by a screenshot.
2. Identify the MAC address of your computer.
   1. MAC ADDRESS \_\_\_\_\_\_\_\_\_\_,
   2. Explain how you obtained the address (what the command is, and in what environment), an explanation accompanied by screenshots.
3. Launch the Wireshark application, launch a recording of the Wireshark application, launch a browser and browse the web, stop the Wireshark operation and analyze the results:
   1. Filter messages to TCP messages only.  
       Select two TCP messages in the fourth layer that are related to each other (same source and destination IP addresses and Ports.
      1. . Specify the number of messages,
      2. . Calculate the length of time between messages,
      3. . Identify the content of ASCII in the messages, and explain the relationship between ASCII and Hexadecimal, and if Hexadecimal exists for what ASCII is required.

The whole answer requires an explanation of how you came to the results, and all this should be accompanied by screenshots.

* 1. Make visual changes to the content you recorded in the previous section
     1. . Filter the view based on the source address,
     2. . Filter the view based on the source address and destination address.
     3. . Filter the view based on a specific message type, for example ARP.

View all results with an explanation, how you came to all the results, and screenshots.

1. . General questions:
   1. Explain what a Faraday cage is and why it is important to communications.
   2. Explain what a half duplex is, and give 3 examples of using this communication method.
   3. Describe the Morse coding method and the advantages of the method.
   4. Describe and explain the methods of multiplexing (how it works, advantages and disadvantages)  
      Each answer is 4 sentences minimum.
2. Indicate the two requirements for communications to take place. What are the technical reasons for the following limitations: transmission rate, speed of propagation, reliability of traffic, information security, minimum RTT time, malicious blockers.  
   (at least one sentence per point)
3. . Describe the electric telegraph in detail, sketching, explaining the electrical, mechanical operation, human-machine interface, defects, advantages (0.5 page answer).
4. About 10 students for the introduction to communication send their name and residential address (5 letters - representing a name + 8 letters - representing a residential address) Separation between the name and the address, and separate every two students make with the help of three digits "1,2,3".  
   The first time the content is sent in digital (8-bit ASCII)) configuration, while the second time in compression based on Morse code. What is the ratio in the amount of content between the first time broadcast and the second time broadcast.

• The answer includes a table that contains all the information including details of names and addresses.

Compare the results for each student individually, and compare the whole group.

1. Explain what a network is, describe the components that make up the network, characterize a network according to its size, number of customers, goals, speeds, complexity management, price and more (the answer is 1/3 - 1/2 page).
2. Give examples of using unicast, Broadcast, Multicast

• In which cases will we use Anycast, (the answer is 1/3 - 1/2 page).

1. Briefly describe the connectivity methods Packet Switching and Circuit Switching, the differences between them, the advantages / disadvantages of each connectivity method and practical examples of the implementation of the different methods. (The answer is 1/3 - 1/2 page).
2. Different frequencies are shown in the table, complete the table with the wavelength and period for each of the frequencies.

|  |  |  |  |
| --- | --- | --- | --- |
| frequency | | Period τ | Wavelength λ |
| Hz | 2.0 | 1/2 |  |
| KHz | 2.0 | 1/2000 |  |
| MHz | 2.0 |  |  |
| GHz | 2.0 | 1/2,000,000,000 |  |
| THz | 2.0 |  |  |

1. Write a summary ( 2 or more sentences), on the 8 standard houses: ITU, IEEE, ANSI, ETSI, ISO, IETF, EIA, Internet Assigned Numbers Authority (IANA)

(Who owns each standard house, what it focuses on, its area of responsibility, the financial side and more).

Use the Tannenbaum book, Internet, and slides. It should be taken into account that there is a high probability that at least one question will appear as a section in the final test