지능형통신시스템 HW #1 (Chap 1 ~ 3) 학번: 이름:

- P1. What are the three most important network criteria?

  performance, reliability, security

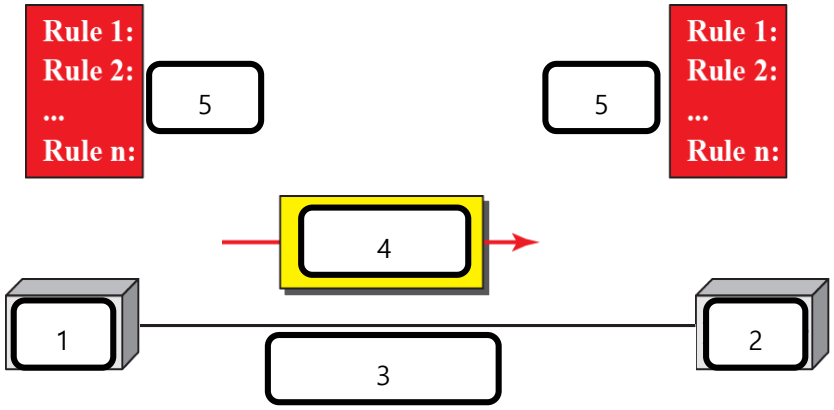
- P2. Given the frequencies listed below, calculate the corresponding periods.

  a. 60 Hz b. 2 MHz c. 1 KHz

  a. $\frac{1}{60}$ s b. $\frac{1}{2} \cdot 10^{-6}$ s c. 10^{-3} s

  $= \frac{1}{2}\mu s$ $= 1$ ms

- P3. The following picture shows the five components required for data communication. Look at the picture below and write the appropriate term for each number in the table.



1	sender
2	receiver
3	transmission medium
4	message
5	protocol

- P4. When we say we are doing "Data Communication", what are the essential components that must exist? (If you answer the number, it is considered incorrect)

  message, protocol

- P5. Assume seven devices are arranged in a mesh topology. How many cables are needed? How many ports are needed for each device?

  $(7 \times 6 \div 2 = 21)$ 21 cables

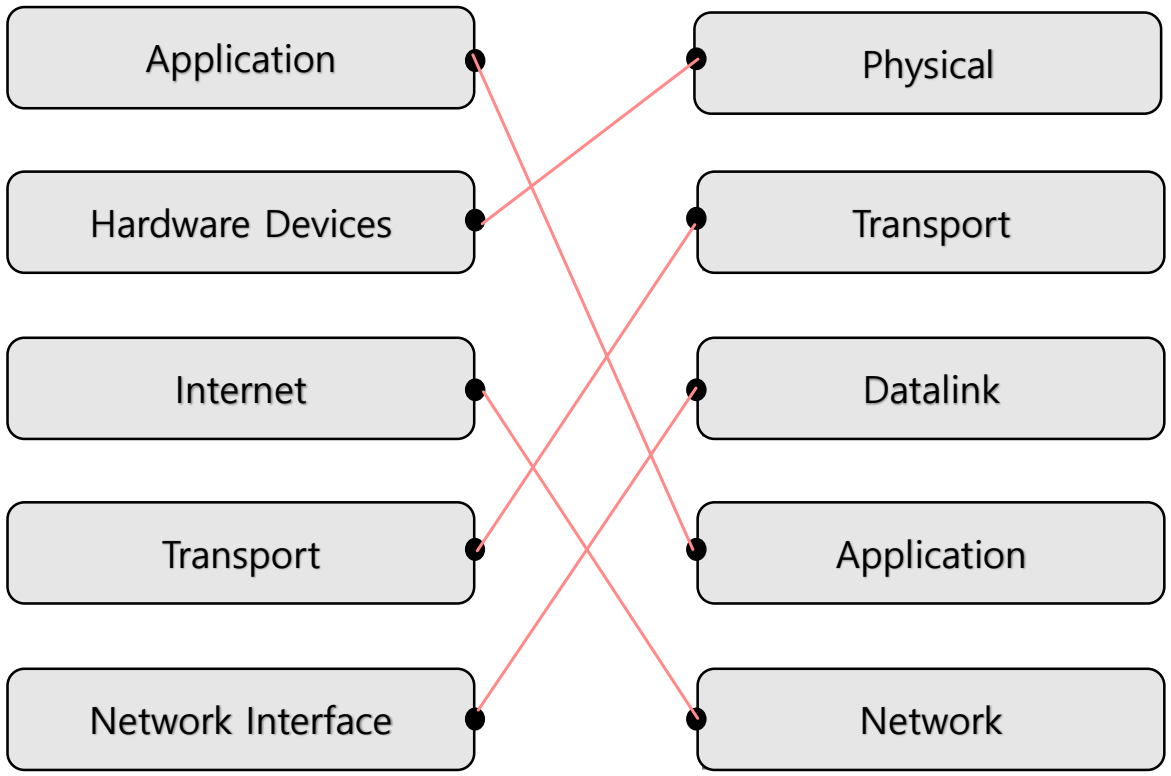
  $(7 - 1 = 6)$ 6 ports

- P6. List the layers responsible for each Switch and Router.

  Switch - Physical, Datalink

  Router - Physical, Datalink, Network

- P7. Look at the picture below and draw a line so that the Original layer and Layers used in this book are connected correctly.



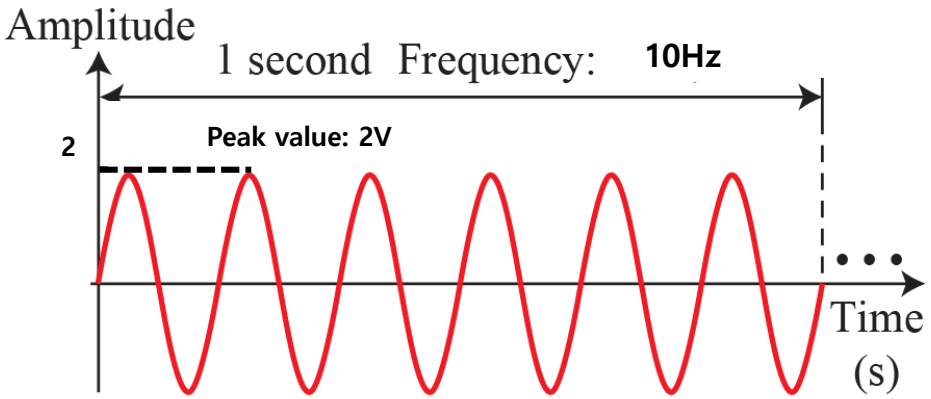
a. Original layers b. Layers used in this book

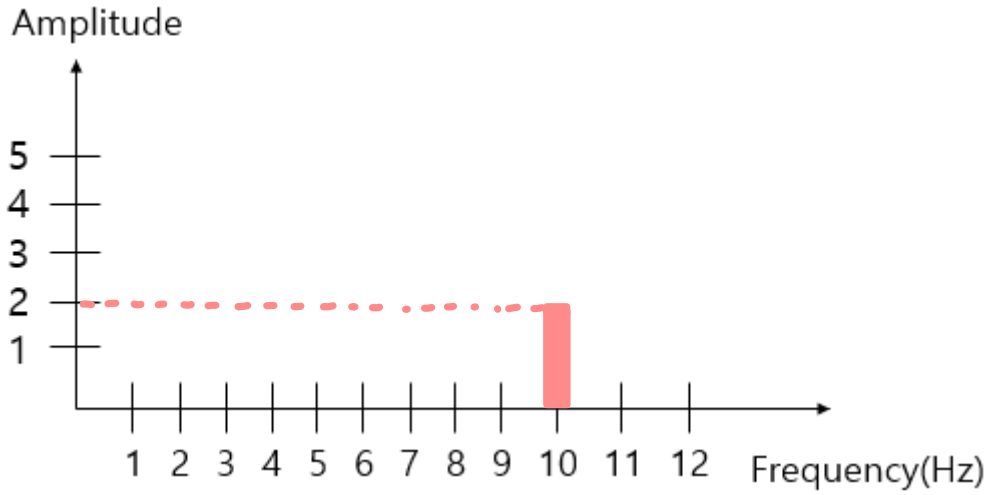
Layers in the TCP/IP protocol suite

- P8. What are the layers in the OSI model that are not in the TCP/IP protocol? (Write it all down)

Presentation and Session

- P9. The graph below expresses the signal in the time domain. Convert the signal below into frequency domain.





- P10. A signal with 400 milliwatts power passes through 8 devices, each with an average noise of 5 microwatts. What is the SNR? What is the SNRdB?

signal power
noise power

$SNR = (400{,}000\,\mu W / 8) / 5\,\mu W = 10{,}000$

$SNR_{dB} = 10 \log_{10} 10^4 = 40$

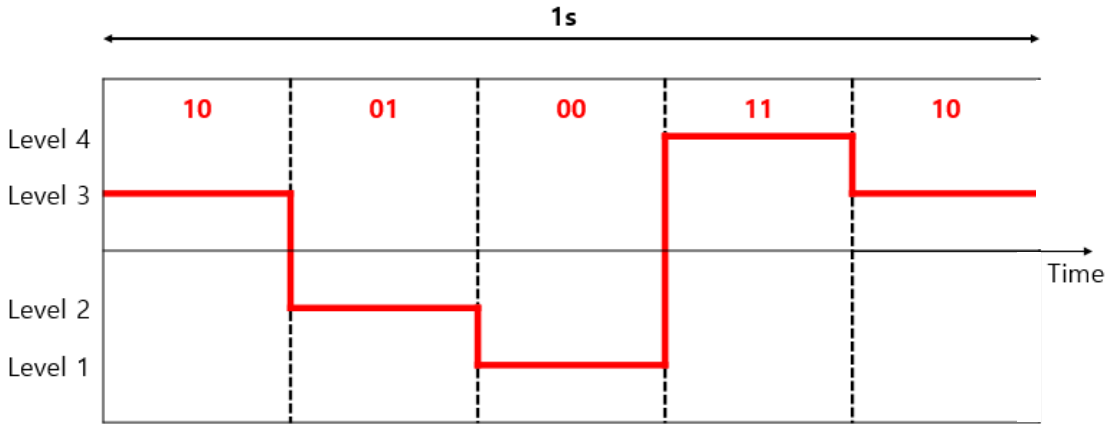
- P11. A digital signal has sixteen levels. How many bits are needed per level?

$\log_2 16 = 4$

4 bits

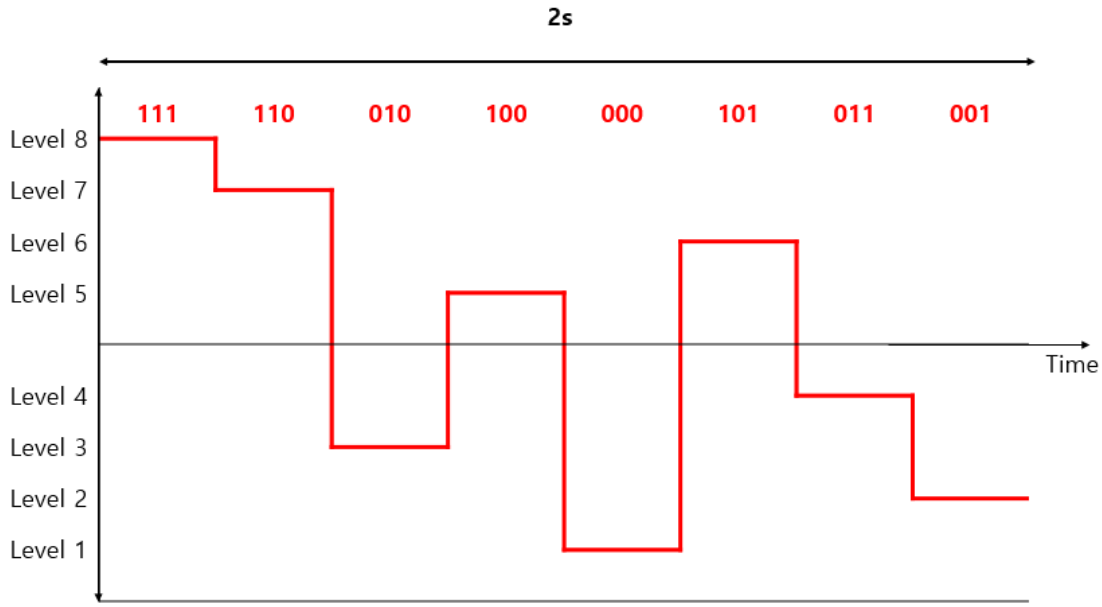
P12 ~13. Look at the following digital signals and answer in bps.

- P12.



10 bps

- P13.



8 x 3 ÷ 2 = 12

12 bps