

Exercise 2 (Chap 2)**Name:** 任皓天

每个题目有10分，最多可以尝试3次，以最后一次回答为准，客观题答完后会自动批改，并且给出标准答案。题目类型为Essay的不会自动批改，分数由老师阅后再给

#1 Points possible: 10

Q. Television channels are 20 MHz wide. How many bits/sec can be sent if 8-level digital signals are used? Assume a noiseless channel.

A. _____ Mbps

#2 Points possible: 10

Q. If a binary signal is sent over a 6-kHz channel whose signal-to-noise ratio is 29 dB, what is the maximum achievable data rate?

A. _____ kbps

#3 Points possible: 10

Q. 19 signals, each requiring 2000 Hz, are multiplexed on to a single channel using FDM. How much minimum bandwidth is required for the multiplexed channel? Assume that the guard bands are 400 Hz wide.

A: _____ Hz

#4 Points possible: 10

Q. Suppose that A, B, and C are simultaneously transmitting 0 bits, using a CDMA system with the chip sequence of figure following:

A: 00011011	A: (-1 -1 -1 +1 +1 -1 +1 +1)
B: 00101110	B: (-1 -1 +1 -1 +1 +1 +1 -1)
C: 01011100	C: (-1 +1 -1 +1 +1 +1 -1 -1)
D: 01000010	D: (-1 +1 -1 -1 -1 -1 +1 -1)
(a)	(b)

What is the resulting chip sequence? give your answer as (+x,-x,-x, ...)

#5 Points possible: 8

Q. A CDMA receiver gets the following chips: (-1 +1 -3 +1 -1 -3 +1 +1). Assuming the chip sequences defined in figure following,

A: 00011011	A: (-1 -1 -1 +1 +1 -1 +1 +1)
B: 00101110	B: (-1 -1 +1 -1 +1 +1 +1 -1)
C: 01011100	C: (-1 +1 -1 +1 +1 +1 -1 -1)
D: 01000010	D: (-1 +1 -1 -1 -1 -1 +1 -1)
(a)	(b)

which stations transmitted, and which bits did each one send?

A. Choose the best answer

- Station A send ☐ sent bit 1 ☐ sent bit 0 ☐ silence
- Station B send ☐ sent bit 1 ☐ sent bit 0 ☐ silence
- Station C send ☐ sent bit 1 ☐ sent bit 0 ☐ silence
- Station D send ☐ sent bit 1 ☐ sent bit 0 ☐ silence

#6 Points possible: 6

Q. A signal is transmitted digitally over a 4-kHz noiseless channel with one sample every 125 μ sec. How many bits per second are actually sent for each of these encoding methods?

- A. 1) CCITT 2.048 Mbps standard: _____ kbps
A. 2) DPCM with a 4-bit relative signal value: _____ kbps
A. 3) Delta modulationard: _____ kbps
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#7 Points possible: 6

Q. What is the percent overhead on a T1 carrier; that is, what percent of the 1.544 Mbps are not delivered to the end user? How about the E1 carrier ?

A. For the T1 carrier: _____ % (give your answer as an integer)

A. For the E1 carrier: _____ % (give your answer as an integer)

#8 Points possible: 10

Q. A simple telephone system consists of two end offices and a single toll office to which each end office is connected by a 1-MHz full-duplex trunk. The average telephone is used to make four calls per 8-hour workday. The mean call duration is 6 min. Ten percent of the calls are long-distance (i.e., pass through the toll office). What is the maximum number of telephones an end office can support? (Assume 4 kHz per circuit.)

A. _____

#9 Points possible: 5

What is the transmission unit for the physical layer?

- ☐ segment
 - ☐ bit
 - ☐ frame
 - ☐ packet
-

#10 Points possible: 5

A noiseless 2-k Hz channel is sampled every 1 msec. What is the maximum data rate?

- ☐ 2000 bps
 - ☐ Can be infinite
 - ☐ 1000 bps
 - ☐ 4000 bps
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#11 Points possible: 5

The cable between toll office and the end office of telephone company are known as the

- ☐ microwave line
 - ☐ trunk
 - ☐ local loop
 - ☐ coaxial cable
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#12 Points possible: 5

An T1 channel contains 24 PCM signals, its data rate is

- ☐ 1.544 Mbps
 - ☐ 2.048 Mbps
 - ☐ 64 kbps
 - ☐ 100 Mbps
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#13 Points possible: 5

An E1 channel contains 32 PCM signals, its data rate is

- ☐ 64 kbps
 - ☐ 10 Mbps
 - ☐ 2.048 Mbps
 - ☐ 1.544 Mbps
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#14 Points possible: 5

An E1 channel contains 32 PCM time slots, the data rate of each time slot channel is

- ☐ 64 kbps
 - ☐ 10 Mbps
 - ☐ 2.048 Mbps
 - ☐ 1.544 Mbps
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