

Exercises:

1. In a communication system, we want to transmit 2-character symbolic words using the characters A, B, C, D, and E with each word having equal probability, using a binary fixed-length code.

- a) How many such symbolic code words can be formed? (3 pts)
- b) What is the minimum number of bits needed for coding? (3 pts)
- c) What is the average amount of information content for the words transmitted? (4 pts)

2. In a communication system, we want to transmit numbers from 50 to 1999 using a **fixed-length BCD code with parity checking**. Each decimal digit is encoded with 4 bits.

- a) What will be the length of the encoded messages? (3 pts)
- b) Create a possible structure of the code table that assigns the binary representation of digits to the numbers. What will be the code for the numbers 51, 75, 102, and 1492 in the system? (7 pts)
- d) How many bits would the messages be if we used pure binary coding with parity checking? (5 pts)

3. Encode the message “**ABBCDBCCDAABBEEEEBEAB**” using Huffman coding! (15 pts)

4. Create an HTML page:

- a) Display an unordered list containing three school subjects. (4 pts)

Write CSS that:

- b) sets the list's left margin to 20px, (3 pts)
- c) makes all list item texts blue. (3 pts)

Don't forget to fill out the additional pages!

Quick Picks: Choose the correct answer!

(1pt / correct answer)

1. HTML is a(n)
 - a. image format.
 - b. imperative programming language.
 - c. XML-based language.
 - d. code editor application.

2. ``
 - a. This tag is used to display a table.
 - b. This tag contains an absolute URL.
 - c. This tag contains an FTP URL.
 - d. This tag contains a relative URL.

3. The CSS property **align-content: center** in a flexbox layout is used to:
 - a. center the items vertically.
 - b. space out the items evenly.
 - c. center the items horizontally.
 - d. align the items to the left.

4. What tool is used to create 2D drafts in OnShape?
 - a. Loft
 - b. Revolve
 - c. Fillet
 - d. Sketch

5. Entropy measures the:
 - a. average amount of information in a set of messages
 - b. frequency of a specific symbol in a dataset
 - c. probability of data being lost
 - d. distance between two messages

SAMPLE TEST

Short Writes: Answer the questions in a few words!

(1pt / correct answer)

1. Write an ordered list with 2 items in HTML!
2. Name 4 CSS properties that can be used to size elements.
3. Write comments in HTML and in CSS languages.
4. Provide the formula for redundancy, given the entropy (H) and maximum of the entropy ($H_{\max}$)!
5. Is the message 1011011 valid for even parity?

SAMPLE TEST