Digital Electronic H.W

DR. INTEHAA ALJUBOURY

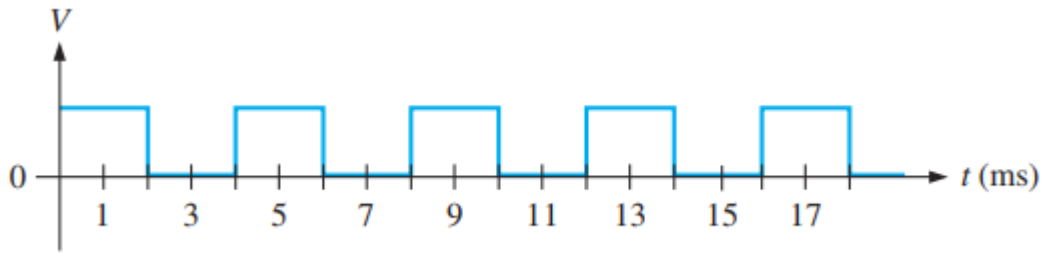
2ND ACADEMIC SEMESTER 2024 - 2025

CHAPTER 1
INTRODUCTORY

Q1- A periodic digital waveform has a pulse width of 25 μs and a period of 150 μs. Determine the frequency and the duty cycle.

Q2- If binary data are transferred on a USB at the rate of 480 million bits per second (480 Mbps), how long will it take to serially transfer 16 bits?

Q3- Determine the duty cycle of the waveform in Figure below?



Q4- Answer the following:

1. Define *binary*.
2. What does *bit* mean?
3. What are the bits in a binary system?
4. How are the rise time and fall time of a pulse measured?
5. Knowing the period of a waveform, how do you find the frequency?
6. Explain what a clock waveform is.
7. What is the purpose of a timing diagram?
8. What is the main advantage of parallel transfer over serial transfer of binary data?

Chapter 2

Number Systems, Operations, and Codes

Q1- Convert the binary numbers to decimal.

(a) 10010001 **(b)** 0.10111 **(c)** 10111101.011

Q2- Convert the following decimal numbers to binary:

(a) 12 **(b)** 25 **(c)** 58

Q3- Add the following binary numbers:

(a) 100 + 10 **(b)** 110 + 100 **(c)** 1111 + 1100

Q4- Perform the following binary subtractions:

(a) 11 – 01 **(b)** 11 – 10 **(c)** 100 – 111

Q5- Perform the indicated binary operations:

(a) 110 × 111 **(b)** 1100 ÷ 011

Q6- Determine the 2's complement of 11001011, 11000000.

Q7- The BCD number for decimal 473 is

(a) 111011010 **(b)** 110001110011 **(c)** 010001110011 **(d)** 010011110011

Q8- Determine the 2's complement of each binary number :

(a) 11 **(b)** 110 **(c)** 1010 **(d)** 1001
(e) 101010 **(f)** 11001 **(g)** 11001100 **(h)** 11000111

Q9- Convert each of the following decimal numbers to 8421 BCD:

(a) 10 **(b)** 13 **(c)** 18 **(d)** 21 **(e)** 25 **(f)** 36
(g) 44 **(h)** 57 **(i)** 69 **(j)** 98 **(k)** 125 **(l)** 156

Q10- Convert each of the BCD numbers to decimal:

(a) 10000000
(b) 001000110111
(c) 001101000110
(d) 010000100001
(e) 011101010100
(f) 100000000000
(g) 100101111000
(h) 0001011010000011
(i) 1001000000011000
(j) 0110011001100111

Q11- Determine which of the following even parity codes are in error:

(a) 100110010 **(b)** 011101010 **(c)** 10111111010001010

Q12- Determine which of the following odd parity codes are in error:

(a) 11110110 **(b)** 00110001 **(c)** 01010101010101010

Q13- Apply CRC to the data bits 10110010 using the generator code 1010 to produce the transmitted CRC code.

Q14- A 7-bit hamming code is received as 1011011. Find the error position and correct the code.

Q15- If the data transmitted along with checksum is 10101001, 00111001, 00011101. But the data received at destination is **0**0101001, **1**0111001, 00011101. Find an error in data received and correct them.