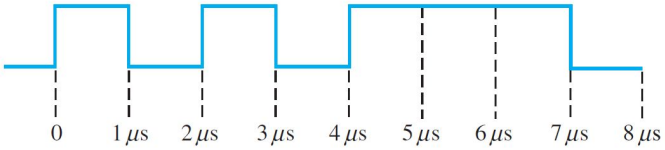
Problem Solving Assignment # 2 Due Date: 21st Feb, 21

a. Identify three different devices from everyday life that work on conversion between analog to digital data. [3]

b. Draw a digital waveform that represents the consecutive high levels of time intervals of 1, 2, 3 and 5 µs with respective low levels of 1µs in between. This waveform repeats at a frequency 62.5kHz. [2]

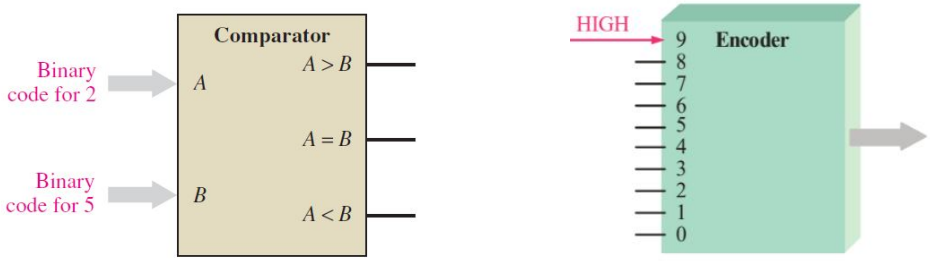
c. Write the bit sequence for the waveform you made in part-b. [1]

d. What is the total serial transfer time for the eight bits in Figure-1? What is the total parallel transfer time? [2]



e. In Figure-2, a waveform has a duty cycle of 70% and frequency 400 kHz. What is the time period for level high and low level parts of the waveform. [1]

f. What will be the output for the logic functions with given inputs. [2]



g. Convert the following decimal or binary numbers into octal, hexadecimal and BCD.[4]
i) 1600_{10} ii) 10000_2 iii) 564_{10} iv) 10000_{10}

h. Convert the following decimal into binary and vice versa. [4]
i) 783_{10} ii) 1220.82_{10} iii) 0110010110_2 iv) 1111.0101_2

i. Convert each pair of decimal numbers to binary and add using the 2's complement form: [3] i) 33 and 15 ii) 56 and -27 iii) 246 and 25

j. Perform multiplication and division between numbers in row A by row B in 2's complement form. [6]

A	00110010	11111010	00010101
B	00001010	00000001	11111011

k. Perform the following conversions. [5]
i) 0010_2 to BCD ii) 1000_8 to BCD iii) 11010_2 to Gray
iv) AA_{16} to BCD v) 1000Gray to binary