

Students Name	Digital Logic Design 25/10/2023	Student ID
	Quiz 1 11-points	

Q1 2-points) What is the binary representation for the BCD number 01000100?

$$\begin{array}{c}
 \underbrace{0100}_4 \underbrace{0100}_4 = (44)_{10} \\
 \downarrow \\
 32 + 8 + 4 \\
 \boxed{101100} \\
 (101100)_2
 \end{array}$$

Q2 6-points) Perform the following numbering system conversion:

$(15.625)_{10} \rightarrow$  Binary

$$\begin{array}{c}
 \underline{15} \\
 1111. \\
 \boxed{1111.101}
 \end{array}
 \quad
 \begin{array}{c}
 0.625 = 0.5 + 0.125 \\
 \frac{1}{2} \quad \frac{1}{8}
 \end{array}$$

$(15.625)_{16} \rightarrow$  Binary

$$\begin{array}{c}
 \underbrace{0001}_1 \underbrace{0101}_5 \cdot \underbrace{0110}_6 \underbrace{0010}_2 \underbrace{0101}_5
 \end{array}$$

$(15.625)_{16} \rightarrow$  Octal

$$\begin{array}{c}
 \underbrace{0001}_x \underbrace{0101}_2 \cdot \underbrace{0110}_3 \underbrace{0010}_4 \underbrace{0101}_5 \\
 (25.3045)_8
 \end{array}$$

Q3 3-points) Perform the subtraction below in Binary, assuming 8-bit and 2's complement representation.

$$(20)_{10} - (25)_{10}$$

$$20 = 16 + 4 = \boxed{\begin{array}{c} \text{8-bits} \\ 00010100 \end{array}}$$

$$25 = 16 + 8 + 1 = \boxed{00011001}$$

$$-25 \longrightarrow \boxed{11100111}$$

$$20 - 25 \qquad 00010100$$

$$= 20 + (-25) = 11100111 \quad 4$$

$$\boxed{11111011}$$

answer is negative

2's complement

$$\textcircled{-5}$$

$$\boxed{00001011}$$

$$5$$