

$$M_2 = 1000101$$

$$N_{16} = 45$$

Q₁ Answer: ① $M_2 = 1000101$ $N_{16} = 45$

1. Student ID ends with 6P

Hence $A_{10} = 6P \Rightarrow$

$$M_2 = 1000101$$

$$\begin{array}{r} 6P \div 2 = 34 \dots 1 \\ 34 \div 2 = 17 \dots 0 \\ 17 \div 2 = 8 \dots 1 \\ 8 \div 2 = 4 \dots 0 \\ 4 \div 2 = 2 \dots 0 \\ 2 \div 2 = 1 \dots 0 \\ 1 \div 2 = 0 \dots 1 \end{array} \uparrow$$

2. $A_{10} = 6P \Rightarrow$

$$N_{16} = 45$$

$$\begin{array}{r} 6P \div 16 = 4 \dots 5 \uparrow \\ 4 \div 16 = 0 \dots 4 \end{array}$$

Q₂ Answer: ① 100010010 ② DE

1) $M_2 + 11001101$

$$\begin{array}{r} 1000101 \\ + 11001101 \\ \hline 100010010 \end{array}$$

2) $N_{16} + 99_{16}$

$$\begin{array}{r} 45 \\ + 99 \rightarrow 15 \\ \hline DE \end{array}$$

Q3

Answer: ① 10111011

$$\textcircled{1} B_{10} = -6P$$

$$M_2 = 1000101$$

$$+b_{10} = M_2 = 01000101$$

$$-b_{10} = \text{inverse}(01000101) + 1$$

$$= 10111010 + 1$$

$$C_2 = 10111011$$

$$N_{16} = 45$$

$$C_2 = 10111011$$

Q4

Answer: Overflow occurs in both operations.

①

$$M_2: 01000101$$

$$C_2: + 10111011$$

$$\hline 100000000$$

↑
overflow

②

$$C_2: 10111011$$

$$+ 01001101$$

$$\hline 100001000$$

↑
overflow

Q5

a): Tommer Hu

Answer: ① 546F6D6D6572204875

② 72 bits

b) Answer: Each Hex digit obtain

4 bits. My name comes with 18

digits in Hex, hence it's $4 \times 18 = 72$ bits