

3.) $156_8 \rightarrow \text{Base } 2, 10, 16$

① Base 10

$$\begin{aligned} \hookrightarrow 156_8 &= 100_8 + 50_8 + 6_8 \\ &= 1 \times 8^2 + 5 \times 8^1 + 6 \times 8^0 \\ &= 64 + 40 + 6 \end{aligned}$$

$$\boxed{110_{10}}$$

② Base 16 $\rightarrow 16 \overline{) 110}$

$$\begin{array}{r} 6 \\ 16 \overline{) 110} \\ \underline{-96} \end{array}$$

$$14 \rightarrow 14 = E$$

$$\text{Base } 16 = \underline{6} \times 16^1 + \underline{E} \times 16^0 = 110_{10}$$

$$\boxed{6E_{16}}$$

③ Base 2

$$\hookrightarrow \begin{array}{cc} 6 & E \\ \downarrow & \downarrow \end{array}$$

$$0110 \ 1110 \rightarrow \boxed{1101110_2}$$

4.) $10101010_2 \rightarrow 8, 10, 16$

① Base 10

$$\begin{aligned} \hookrightarrow 10101010_2 &= 1 \times 2^7 + 0 \times 2^6 + 1 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 \\ &\quad + 1 \times 2^1 + 0 \times 2^0 = 170 \end{aligned}$$

$$\hookrightarrow \boxed{170_{10}}$$

② Base 16 $\rightarrow 16 \overline{) 170}$

$$\hookrightarrow 1010 \ 1010$$

$$\begin{array}{cc} \downarrow & \downarrow \\ A & A \end{array} \rightarrow \boxed{AA_{16}}$$

$$\begin{array}{ccc} \text{③ Base } 8 \rightarrow 10101010 & \rightarrow & 010 \mid 101 \mid 010 \\ & & \downarrow \quad \downarrow \quad \downarrow \\ & & 2 \quad 5 \quad 2 \end{array} \rightarrow \boxed{252_8}$$