

Assignment - 1

1

(i) dec \rightarrow bin

$$\begin{array}{r}
 2 \overline{) 72945} \\
 2 \overline{) 36472} \\
 2 \overline{) 18236} \\
 2 \overline{) 9118} \\
 2 \overline{) 4559} \\
 2 \overline{) 2279} \\
 2 \overline{) 1139} \\
 2 \overline{) 569} \\
 2 \overline{) 284} \\
 2 \overline{) 142} \\
 2 \overline{) 71} \\
 2 \overline{) 35} \\
 2 \overline{) 17} \\
 2 \overline{) 8} \\
 2 \overline{) 4} \\
 2 \overline{) 2} \\
 2 \overline{) 1} \\
 0 \quad 1
 \end{array}$$

$$\therefore \text{bin} = (10001110011110001)_2$$

(ii) dec \rightarrow BCD

$$\begin{aligned}
 & (72945)_{10} \\
 & = (0111 \ 0010 \ 1001 \ 0100 \ 0101)_{\text{BCD}}
 \end{aligned}$$

(iii) dec \rightarrow Ex 5

$$\begin{aligned}
 & (72945)_{10} \\
 & \begin{array}{c} \swarrow \downarrow \downarrow \downarrow \searrow \\ 12 \quad 7 \quad 14 \quad 9 \quad 10 \end{array} \\
 & = (1100 \ 0111 \ 1110 \ 1001 \ 1010)_{\text{Ex-5}}
 \end{aligned}$$

$$\begin{aligned}
 & \text{bin} \neq \text{BCD} \neq \text{Ex-5} \\
 & \text{(Proved)}
 \end{aligned}$$

2

$$\begin{aligned}
 (2F8.BE)_{16} & \rightarrow 2 \times 16^2 + F \times 16^1 + 8 \times 16^0 + B \times 16^{-1} + E \times 16^{-2} \\
 & = (760.74218)_{10}
 \end{aligned}$$

$$\begin{array}{r}
 6 \overline{) 760} \\
 6 \overline{) 126} \quad 4 \leftarrow \text{LSB} \\
 6 \overline{) 21} \quad 0 \\
 6 \overline{) 3} \quad 3 \\
 0 \quad 3 \leftarrow \text{MSB}
 \end{array}$$

$$\begin{aligned}
 0.74128 \times 6 & = 4.44768 & 4 \leftarrow \text{MSB} \\
 0.44768 \times 6 & = 2.68608 & 2 \\
 0.68608 \times 6 & = 4.11648 & 4 \leftarrow \text{LSB}
 \end{aligned}$$

$$\therefore (760.74218)_{10} = (3304.424)_6$$

3

$$(a) \ 23 - (-15) = 23 + 15$$

$$\begin{array}{r} \cancel{15} \quad 23 = 010111 \\ + \quad 15 = 001111 \\ \hline 38 = 100110 \end{array}$$

overflow

$$\begin{array}{r} \cancel{15} \quad 23 = 010111 \\ + \quad 15 = 001111 \\ \hline 38 = 100110 \end{array}$$

overflow

$$\textcircled{b} -89 = -(000001011001) = (111110100110)_{16} \\ = (111110100111)_{25}$$

$$\begin{array}{r} \cancel{15} \quad -89 = 111110100110 \\ + \quad 74 = 000001001010 \\ \hline -15 = 111111100000 \end{array}$$

no overflow

$$\begin{array}{r} \cancel{25} \quad -89 = 111110100111 \\ + \quad 74 = 000001001010 \\ \hline -15 = 111111100001 \end{array}$$

no overflow

$$\underline{4} \mid 620_x) 56214306_y (00064004$$

$$\begin{array}{r} 0 \\ \hline 56 \\ 0 \\ \hline 562 \\ 0 \\ \hline 5621 \\ 5250 \\ \hline 3414 \\ 3410 \\ \hline 43 \\ 0 \\ \hline 430 \\ 0 \\ \hline 4306 \\ 3410 \\ \hline 566 \end{array}$$

$$\therefore \text{Quotient} = 64004 \\ \text{Remainder} = 566$$

$$\underline{5} \mid \text{Cake} = (1101)_2 = 13_{10}$$

$$\text{Ballons} = (24)_8 = 20_{10}$$

$$\text{Decor} = (1A)_{16} = 26_{10}$$

$$\text{Snacks} = (101)_2 = 5_{10} \times 5 = 25_{10}$$

$$\therefore \text{Total cost} = 13 + 20 + 26 + 25 = 84_{10}$$

$$\text{My money} = (100011)_2 = 35_{10}$$

$$\therefore \text{Deficit} = 84 - 35 = 49_{10}$$