

Worksheet 10 Solution

March 19, 2020

Question 1

a.

$$(165)_8 = 5 \times 8^0 + 6 \times 8^1 + 1 \times 8^2 \quad (1)$$

$$= 5 + 48 + 64 \quad (2)$$

$$= 117 \quad (3)$$

b. **Reference Table**

Number	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Value	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

$$(B4)_{16} = 4 \times 16^0 + 11 \times 16^1 \quad (1)$$

$$= 4 + 176 \quad (2)$$

$$= 180 \quad (3)$$

Question 2

a.

$$\begin{aligned}357 \div 2 &= 178, \text{ remainder } \mathbf{1} \\178 \div 2 &= 89, \text{ remainder } \mathbf{0} \\89 \div 2 &= 44, \text{ remainder } \mathbf{1} \\44 \div 2 &= 22, \text{ remainder } \mathbf{0} \\22 \div 2 &= 11, \text{ remainder } \mathbf{0} \\11 \div 2 &= 5, \text{ remainder } \mathbf{1} \\5 \div 2 &= 2, \text{ remainder } \mathbf{1} \\2 \div 2 &= 1, \text{ remainder } \mathbf{0} \\1 \div 2 &= 0, \text{ remainder } \mathbf{1}\end{aligned}$$

Hence, the binary representation of 357 is $(101100101)_2$.

b.

$$\begin{aligned}357 \div 8 &= 44, \text{ remainder } \mathbf{5} \\44 \div 8 &= 5, \text{ remainder } \mathbf{4} \\5 \div 8 &= 0, \text{ remainder } \mathbf{5}\end{aligned}$$

Hence, the octal representation of 357 is $(545)_8$.

c.

$$\begin{aligned}357 \div 16 &= 22, \text{ remainder } \mathbf{5} \\22 \div 16 &= 1, \text{ remainder } \mathbf{6} \\1 \div 16 &= 0, \text{ remainder } \mathbf{1}\end{aligned}$$

Hence, the hexadecimal representation of 357 is $(165)_{16}$.

Question 3