Aleeza
Choudry
Dr. Lehr
CSC-17A-44285

Lab 2 Conversions Base 2, 8, 10, 16

1.) 0.25_{10} → Base 2, 8, 16

① 0.25_{10} → Base 2 → $\boxed{.01_2}$

$0.25 \times 2 = 0.50$

$0.50 \times 2 = 1.0$

② 0.25_{10} → Base 8 → $\boxed{.2_8}$

$0.25 \times 8 = 2.0$ ↳ $= 2 \times 8^{-1} = {}^{2}/_{8} = 0.25_{10}$ ✓

~~$0.0 \times 8 = 0$~~

③ 0.25_{10} → Base 16 → $\boxed{.4_{16}}$

$.010000_2 = 0.4_{16} = 4 \times 16^{-1} = {}^{4}/_{16} = {}^{1}/_{4} = 0.25_{10}$ ✓

or $0.25_{10} \times 16 = 4.0 = 0.4_{16}$

2.) 0.25_8 → Base 2, 10, 16

① 0.25_8 → Base 10

$0.25_8 = 2 \times 8^{-1} + 5 \times 8^{-2}$

$= {}^{2}/_{8} + {}^{5}/_{64} =$

$= {}^{128}/_{512} + {}^{40}/_{512} = \boxed{{}^{168}/_{512}{}_{10}}$ or $.328125_{10}$

② 0.25_8 → Base 2 → $\boxed{.010101_2}$ ③ 0.25_8 → Base 16 → $\boxed{.54_{16}}$

0.	2	5			
	↓	↓		.0101	0100
	010	101	→ 0.010101_2	5	4 → 0.54_{16}

3.) 0.25_{16} → Base 2, 8, 10

① 0.25_{16} → Base 2 → $\boxed{.00100101_2}$

0.	2	5
	0010	0101 → $.00100101_2$

② 0.25_{16} → Base 8 → $\boxed{.112_8}$

.001	001	010
1	1	2 → $.112_8$

③ 0.25_{16} → Base 10 →

$0.112_8 = 1\times8^{-1} + 1\times8^{-2} + 2\times8^{-3}$

$= 1/8 + 1/64 + 2/512$

$= 64/512 + 8/512 + 2/512 = \boxed{74/512_{10}}$ or $.14453125_{10}$

4.) 0.1101_2 → Base 8, 10, 16

① 0.1101_2 → Base 8 → $\boxed{.64_8}$

.110	100
6	4 → $.64_8$

③ 0.1101_2 → Base 16

.1101
D (15) → $\boxed{.D_{16}}$

② 0.1101_2 → Base 10

$0.1101_2 = 1\times2^{-1} + 1\times2^{-2} + 0\times2^{-3} + 1\times2^{-4}$

$= 1/2 + 1/4 + 0 + 1/16$

$= \frac{8}{16} + \frac{4}{16} + \frac{0}{16} + \frac{1}{16} = \boxed{13/16_{10}}$ or $.8125_{10}$