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Lab 2 : Part 2.

Q: 1

(a) 02C1 : 074F

Physical = (segment x 16) + offset.

$= (02C1_{16} \times 16) + 1871_{10}$

$= (02C10 + 074F)$

$= 02C10$
$\quad\; 074F$
$\overline{\quad\quad\quad}$
Physical address = 0335F

Ans : 0335F

(b) 15C5 : 4CCF

Physical = (segment x 16) + offset.

$= (15C5_{16} \times 16) + 4CCF$

$= 15C50 + 4CCF$

$= 15C50$
$\quad\; 4CCF$
$\overline{\quad\quad\quad}$
Physical address = 1A91F

Ans - 1A91F

Q-2

(a) Physical address C4ADB, offset 8ABB

$$\text{Segment} = \frac{\text{Physical address} - \text{offset}}{16}$$

$$= \frac{C4ADB - 8ABB}{16}$$

$$= \begin{array}{r} {}^{B}\not{C}^{14}4ADB \\ -\ 08ABB \\ \hline BC020 \end{array}$$

$$= \frac{BC020}{16}$$

Segment Value = BC02

(b) Physical address 1B0DC, offset 007C

$$\text{Segment} = \frac{\text{Physical address} - \text{offset}}{16}$$

$$= \frac{1B0DC - 007C}{16}$$

$$= \begin{array}{r} 1B0DC \\ -\ 007C \\ \hline 1B060 \end{array}$$

$$= \frac{1B060}{16}$$

Segment Value = 1B06

Q-3

(a) Physical address AACDF, Segment 6328

offset = Physical − (Segment × 16)

= AACDF − (6328 × 16)

= AACDF − 9E480

= 0E55F

(b) Physical address 32820, Segment 13A7

offset = 32820 − (13A7 × 16)

= 32820 − 1D4B0

= 15370

use inverse formula to check

Physical = (segment × 16) + offset

= (6328 × 16) + 0E55F

= 9E480 + 0E55F

verify: = AACDF

Q-4

(a) -9.8

Sign = 1

9/2 = 4 R1

4/2 = 2 R0

2/2 = 1 R0

1/2 = 0 R1

= 1001

where R = reminder

0.8 x 2 = 1.6

0.6 x 2 = 1.2

0.2 x 2 = 0.4

0.4 x 2 = 0.8

0.8 x 2 = 1.6

= 1001.1101 1001 1001 1001 .... ∞

Normalize = 1001.1101 1001 1001 1001 ... ∞ x 2^3

Biased exponent = 127 + 3 = 130

= 10000010

sign	exponent	significant
1	10000010	00111001 1001 1001 1001 100

Ans : 1 10000010 00111001 1001 1001 1001 100

(b) 12.32

Sign = 0

12/2 = 6 R0

6/2 = 3 R0

3/2 = 1 R1

1/2 = 0 R1

= 1100

0.32 X 2 = 0.64

0.64 X 2 = 1.28

0.28 X 2 = 0.56

0.56 X 2 = 1.12

0.12 X 2 = 0.24

0.24 X 2 = 0.48

0.48 X 2 = 0.96

0.96 X 2 = 1.92

0.92 X 2 = 1.84

0.84 X 2 = 1.68

0.68 X 2 = 1.36

0.36 X 2 = 0.72

0.72 X 2 = 1.44

0.44 X 2 = 0.88

0.88 X 2 = 1.76

0.76 X 2 = 1.52

0.52 X 2 = 1.04

0.04 X 2 = 0.08

0.08 X 2 = 0.16

0.16 X 2 = 0.32

0.32 X 2 = 0.64

0.64 X 2 = 1.28

0.28 X 2 = 0.56

1100.0101 0001 1110 1011 1000 0101...

Normalize = 1100 0101 0001 1110 1011

10000101... X 2^3

Biased exponent = 127 + 3 = 130

= 1000 0010

Sign exponent significant

0 10000010 1000 1010 0011 1101 0111 000

Ans 0 10000010 1000 1010 0011 1101 0111 000

Q-5

(a) 1 01111100 1000 0001 1000 1011 1011 100

sign = -ve (negative)

exponent = 0111 1100

= 124 - 127

= -3

Normalize = 1.10000001 1000 1011 1011 100 $\times 2^{-3}$

= 0.0011 0000000 11 000100 11 1011 100

$= 2^{-3} + 2^{-4} + 2^{-11} + 2^{-12} + 2^{-16} + 2^{-18} + 2^{-19} + 2^{-20} + 2^{-22} + 2^{-23} + 2^{-24}$

= 0.18825

Ans = -0.18825

(b) 0 10001100 0000 1011 1011 1011 1011 102

sign = +ve (positive)

exponent = 1000 1100 = 140

= 140 - 127

= 13

Un-Normalize = -1.0 0001011 1011 1011 1011 101

normalize = 10000101111 10111.0111011101 $\times 2^{13}$

= 10001 10111 10111

$= 2^{14} + 2^{10} + 2^{9} + 2^{7} + 2^{6} + 2^{5} + 2^{4} + 2^{2} + 2^{1}$

= 18167

.0111011101

$= 2^{-2} + 2^{-3} + 2^{-4} + 2^{-6} + 2^{-7} + 2^{-8} + 2^{-10}$

= 0.466820312 5

Ans = +18167.46582