NUMBER SYSTEM – 03

(9) Solve any 5 examples of decimal to hexa decimal.

(1) 540.62

		R
16	540	12
16	33	1
16	2	2
16	0	0

- $0.62 \times 16 = 9 + 0.92$
- $0.92 \times 16 = 14 + 0.72$
- $0.72 \times 16 = 11 + 0.52$
- $0.52 \times 16 = 8 + 0.32$
- $0.32 \times 16 = 5 + 0.12$
- $0.12 \times 16 = 1 + 0.92$
- $0.92 \times 16 = 14 + 0.72$

$(540.62)_{10} = (21C.9EB851E)_{16}$

(2) 60.222

16	60	12
16	3	3

- $0.222 \times 16 = 3 + 0.552$
- $0.552 \times 16 = 8 + 0.832$
- $0.832 \times 16 = 13 + 0.312$
- $0.312 \times 16 = 4 + 0.992$
- $0.992 \times 16 = 15 + 0.872$
- $0.872 \times 16 = 13 + 0.952$
- $0.952 \times 16 = 15 + 0.232$

$(60.222)_{10} = (3C.38D4FDF3)_{16}$

(3) 160.422

16	160	0
16	10	10

- 0.422 x 16 = 6 + 0.752
- 0.752 x 16 = 12 + 0.032
- 0.032 x 16 = 0 + 0.512
- 0.512 x 16 = 8 + 0.192
- 0.192 x 16 = 3 + 0.072
- 0.072 x 16 = 1 + 0.152
- 0.152 x 16 = 2 + 0.432

$(160.422)_{10} = (A0.6C08312)_{16}$

(5) 248.24

16	248	8
16	15	15

- 0.24 x 16 = 3 + 0.84
- 0.84 x 16 = 13 + 0.44
- 0.44 x 16 = 7 + 0.04
- 0.04 x 16 = 0 + 0.64
- 0.64 x 16 = 10 + 0.24
- 0.24 x 16 = 3 + 0.84
- 0.84 x 16 = 13 + 0.44

$(248.24)_{10} = (F8.3D70A3D)_{16}$

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(b) Hexadecimal to decimal conversion 5 examples.

(a) A2.433

$(A2.433)_{16} = 2\times16^{0} + 10\times16^{1} + 4\times16^{-1} + 3\times16^{-2} + 3\times16^{-3}$
$= (162.262451171875)_{10}$

(b) E1.A5E

$(E1.A5E)_{16} = 1\times16^{0} + 14\times16^{1} + 10\times16^{-1} + 5\times16^{-2} + 14\times16^{-3}$
$= (225.647949218375)_{10}$

(c) A1.0A2

$(A1.0A2)_{16} = 1\times16^{0} + 10\times16^{1} + 0\times16^{-1} + 10\times16^{-2} + 2\times16^{-3}$
$= (161.039550781250)_{10}$

(d) 87.1FD

$(87.1FD)_{16} = 7\times16^{0} + 8\times16^{1} + 1\times16^{-1} + 15\times16^{-2} + 13\times16^{-3}$
$= (135.1243)_{10}$

(e) 1B8.1FD8A

$(1B8.1FD8A)_{16} = 8\times16^{0} + 12\times16^{-1} + 1\times16^{2} + 1\times16^{-1}$
$+ 15\times16^{-2} + 8\times16^{-3} + 10\times16^{-4}$

$= (440.1244)_{10}$

(d) 5 examples of hexadecimal to octal.

(a) 1AF.66

(1) $(1AF.66)_{16} = 15 \times 16^0 + 10 \times 16^1 + 1 \times 16^2 + 6 \times 16^{-1} + 6 \times 16^{-2}$

$= (431.3984)_{10}$

(2) $(431.3984)_{10}$

8	431	7
8	53	5
8	6	6

- $0.3984 \times 8 = 3 + 0.1872$
- $0.1872 \times 8 = 1 + 0.4976$
- $0.4976 \times 8 = 3 + 0.9808$
- $0.9808 \times 8 = 7 + 0.8464$

$(1AF.66)_{16} = (657.3137)_8$

(b) B2.A2

(1) $(B2.A2)_{16} = 2 \times 16^0 + 11 \times 16^1 + 10 \times 16^{-1} + 2 \times 16^{-2}$

$= (178.63281)_{10}$

(2)

8	178	2
8	22	6
8	2	2

- $0.6328 \times 8 = 5 + 0.0624$
- $0.0624 \times 8 = 0 + 0.4992$
- $0.4992 \times 8 = 3 + 0.9936$

$(B2.A2)_{16} = (262.5032)_8$

(c) A3.2B

(1) $(A3.2B)_{16} = 3\times16^{0} + 10\times16^{1} + 2\times16^{-1} + 11\times16^{-2}$

$= (163.1679)_{10}$

(2)

8	163	3
8	20	4
8	2	2

- $0.1679\times8 = 1 + 0.3432$
- $0.3432\times8 = 2 + 0.7456$
- $0.7456\times8 = 5 + 0.9648$

$(A3.2B)_{16} = (243.126)_{8}$

(d) 1B2.1F

(1) $(1B2.1F)_{16} = 2\times16^{0} + 11\times16^{1} + 1\times16^{2} + 1\times16^{-1} + 15\times16^{-2}$

$= (434.1210)_{10}$

(2)

8	434	2
8	54	6
8	6	6

- $0.1210\times8 = 0 + 0.968$
- $0.968\times8 = 7 + 0.744$
- $0.744\times8 = 5 + 0.952$

$(1B2.1F)_{16} = (662.075)_{8}$.

(e) C1.AA2

(1) $(C1.AA2)_{16} = 1\times16^{0} + 12\times16^{1} + 10\times16^{-1} + 10\times16^{-1} + 2\times16^{2}$

$= (193.664)_{10}$

(2)

8	193	1
8	24	0
8	3	3

- $0.664\times8 = 5 + 0.312$
- $0.312\times8 = 2 + 0.496$

$(C1.AA2)_{16} = (301.5242)_{8}$.

(c) Octal to Hexadecimal

(1) $(321.3)_8$

$(321.3)_8 = (011\ 010\ 001 . 011)_2$

$= (0001\ 1010\ 0001 . 0110)_2$

$= (D1.6)_{16}$

(2) $(67.123)_8$

$= (110\ 111 . 001\ 010\ 011)$

$= (0011\ 0111 . 0001\ 0010\ 1000)_2$

$= (37.128)_{16}$

(3) $(251.35)_8$

$= (010\ 101\ 001 . 011\ 101)$

$= (1010\ 1001 . 0111\ 0100)$

$= (A9.74)_{16}$

(4) $(555.47)_8 \rightarrow ?$

$= (101\ 101\ 101 . 100\ 111)_2$

$= (16D.9C)_{16}$

(5) $(54.12)_8$

$= (101\ 100 . 001\ 010)_2$

$= (2C.28)_{16}$

(e) 5 examples of binary to hexadecimal.

(1) $(1101\,00.11)_2 = 0011\,0100.1100$
$= (34.C)_{16}$

(2) $(0100110.10110110)_2 = 00100110.10110110$
$= (26.36)_2$

(3) $(00110101\,11.11)_2 = 01101011.1100$
$= (6B.C)_{16}$

(4) $(1101011.1010)_2 = 0110\,1011.1010$
$= (6B.A)_{16}$

(5) $(101111011.1110) = 000101111011.1110$
$= (17B.E)_{16}$

(f) 5 examples of hexadecimal to binary.

(1) $(6C.12)_{16} = 01101100.00010010$
$= (01101100.00010010)_2$

(2) $(5BA.56)_{16} = (010110111010.01010110)_2$

(3) $(50A.51)_{16} = (101000101010.010100001)_2$

(4) $(67.1E)_{16} = (01100111.00011111)_2$

(5) $(10A.AB) = (0010000010010.10101011)_2$