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PPS - Assignment Sec-A

1. Convert the following no. with the indicated bases to decimal

(a) $(12121)_3 = (152)_{10}$

$1\times3^4 + 2\times3^3 + 1\times3^2 + 2\times3^1 + 1\times3^0 \Rightarrow 152$

(b) $(4310)_5 = (580)_{10}$

$4\times5^3 + 3\times5^2 + 1\times5 + 0\times5^0 \Rightarrow 580$

c. $(50)_7 = (35)_{10}$

$5\times7 + 0\times7^0 \Rightarrow 35$

d. $(AG)_{12} = (126)_{10}$

$10\times12 + 6\times12^0 \Rightarrow 126$

2. Solve following

(i) $(9ADF\cdot BC)_{16} = (39647.734)_{10}$

$(9\times16^3 + 10\times16^2 + 13\times16^1 + 15\times16^0)\cdot(11\times(16)^{-1} + 12\times(16)^{-2})$

(ii) $(9ADF\cdot BC)_{16} = (115337.274)_8$

~~$(39647.734)_{10} \Rightarrow$ in $(\quad)_8$~~

$(1001\ 1010\ 1101\ 1111\cdot 1011\ 1100)$

(making group of 3 bits)

3. Convert $(125.125)_{10}$ into binary, octal, hexadecimal numbers.

Binary $\Rightarrow$ $(125.125)_{10} = (1111101.001)_2$

2	125	
2	62	1
2	31	0
2	15	1
2	7	1
2	3	1
2	1	1
	0	1

$.125 \times 2 = .250$ — 0

$.250 \times 2 = .500$ — 0

$.500 \times 2 = 1.000$ — 1

Octal $\Rightarrow$ $(125.125)_{10} = (175.1)_8$

8	125	
8	15	5
8	1	7
	0	1

$.125 \times 8 = 1.000$ — 1

Hexadecimal $\Rightarrow$ $(125.125)_{10} = (\cancel{713.2}\ 7D.2)_{16}$

16	125	
16	7	13
	0	7

$.125 \times 16 = 2.000$

4. find decimal eq^n of following

(i) $(111.01)_2 \Rightarrow (7.25)_{10}$

$(1\times2^2 + 1\times2 + 1\times1) \cdot (0\times2^{-1} + 1\times2^{-2})$

(ii) $(247.65)_8 \Rightarrow (167.828)_{10}$

$(2\times8^2 + 4\times8 + 7\times1) \cdot \left(\frac{6}{8} + \frac{5}{64}\right)$

(iii) $(1101.001)_2 \Rightarrow (13.125)_{10}$

$(1\times2^3 + 1\times2^2 + 0 + 1) \cdot \left(0 + 0 + \frac{1}{8}\right)$

(iv) $(A2A.D4)_{16} = (2602.828)_{10}$

$(10\times256 + 2\times16 + 10) \cdot \left(\frac{13}{16} + \frac{4}{256}\right)$

$\Rightarrow (2602.828)_{10}$

5. Find $(10110110)_2 - (01101110)_2$ using 2's complement

~~##~~ 10110110 — (1)

01101110 — (2)

take 2's complement of (2) (revert all bits)

10010001 (add 1)

+1

10010010

(1) + (2) $\Rightarrow$ 10110110

+10010010

carry ← (1) 01001000

drop

Ans (01001000)

6. $(0101111)_2 + (1101100)_2 \Rightarrow$

$$\begin{array}{r} {\scriptstyle 1\ \ 1\ \ \ \ \ \ } \\ 0\,1\,0\,1\,1\,1\,1 \\ +\ 1\,1\,0\,1\,1\,0\,0 \\ \hline 1\,0\,0\,1\,1\,0\,1\,1 \end{array}$$

Ans (1001011)