Qn. 5

Complete the Series.

താഴെ കൊടുത്തിരിക്കുന്നത് പൂരിപ്പിക്കുക.

(a) 6ADD , 6ADF , 6AE1 , ... , ...

(b) 14A9 , 14AF , 14B5, ... , ...

Ans a) Consider the sequence

6ADD, 6ADF, 6AE1, ---------------------------------

Here the 'numbers' are

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, 10, 11, ---

The difference between 6ADD & 6ADF is 2

ie. 6ADD, 6ADE, 6ADF

   (1)   (2)

Similarly 6ADF & 6AE1 is 2

ie, 6ADF, 6AEO, 6AE1

   (1)   (2)

So Add 2 to 6AE1 we will ge 6AE3 Then add 2 to 6AE3 we will get 6AE5 Therefore the missing terms 6AE3, 6AE5

b) Consider the sequence.

14A9, 14AF, 14B5, ----------------

The difference between 14A9 and 14AF is 6

The normal sequence is

ie 14A9, 14AA, 14AB, 14AC, 14 AD, 14AE, 14AF

   (1)   (2)   (3)   (4)   (5)   (6)

The difference between 14AF and 14B5 is also 6

The normal sequence is

ie 14AF, 14BO, 14B1, 14B2, 14B3, 14B4, 14B5

   (1)   (2)   (3)   (4)   (5)   (6)

Similarly the next 6 terms in the sequence are given below.

14B5, 14B6, 14B7, 14B8, 14B9, 14BA, 14BB

   (1)   (2)   (3)   (4)   (5)   (6)

Similarly the next 6 terms are

14BB, 14BC, 14BD, 14BE, 14BF, 14CO, 14C1

   (1)   (2)   (3)   (4)   (5)   (6)

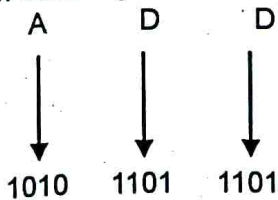So the missing terms are 14BB and 14C1

Qn. 6

Find the octal numbers corresponding to the following numbers using shorthand method.

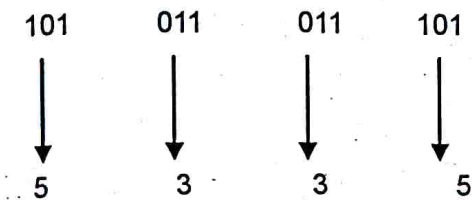Short hand method ഉപയോഗിച്ച് താഴെ കൊടുത്തിരിക്കുന്ന നമ്പറുകളുടെ corresponding octal നമ്പറുകൾ കാണുക.

(a) $(ADD)_{16}$ (b) $(DEAD)_{16}$

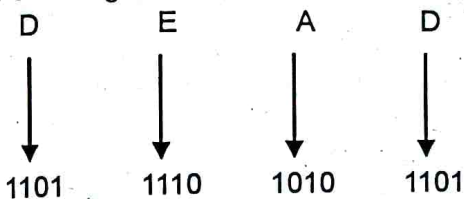a) Step 1 : Write down the 4 bit binary equivalent of each digit.

A → 1010
D → 1101
D → 1101

Step 2 : Divide this number into groups of 3 bits starting from the right and write down the octal equivalent.

101 → 5
011 → 3
011 → 3
101 → 5

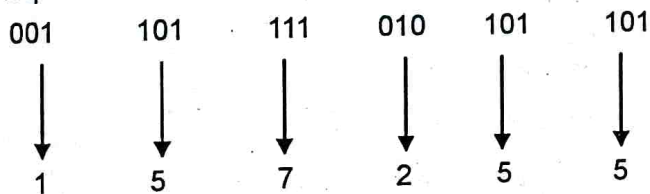$(ADD)_{16} = (5335)_8$

b) Step 1 : Write down the 4 bit binary equivalent of each digit.

D → 1101
E → 1110
A → 1010
D → 1101

Step 2 : Divide this number into groups of 3 bits starting from the right and write down the octal equivalent.

001 → 1
101 → 5
111 → 7
010 → 2
101 → 5
101 → 5

$(DEAD)_{16} = (157255)_8$

Qn. 7

If $(126)x = (56)y$, then find x and y.

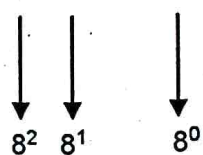(126)x = (56)y എങ്കിൽ X ഉം y ഉം കണ്ടു പിടിക്കുക.

Ans L.H.S contains 2 & 6   So $x \neq 2$
R.H.S contains 5 & 6   So $y \neq 2$
L.H.S > R.H.S   So x < y and $x \neq y$ also
The possible values of x and y are given below.

x	y	Reason
8	10 or 16	x<y & x≠ y
10	16	

Case I
Let x =8 then y = 10
$(1 \quad 2 \quad 6)_8$ it is greater than $(56)10$

$8^2 \quad 8^1 \quad 8^0$

So when x = 8 then y 10

Case II
Let x =8 then y = 16
$1 \quad 2 \quad 6$ $= 1 \times 8^2 + 2 \times 8^1 + 6 \times 8^0$

$8^2 \quad 8^1 \quad 8^0$

$= 64 + 16 + 6$
$= (86)_{10}$
$(5 \quad 6)_{16}$ $= 5 \times 16 + 6 \times 16^0$

$16^1 \quad\quad 16^0 = 80 \times 6 = (86)_{10}$
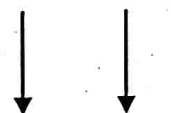
So   x = 8 and y = 16

Qn. 8

If $(102)x = (42)y$ then $(154)x = (......)y$.

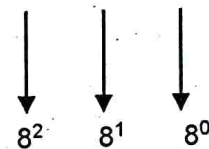(102)x = (42)y എങ്കിൽ (154)x = (-)y എന്തെന്ന് കണ്ടു പിടിക്കുക.

Ans L.H.S contains 2 So So $x \neq 2$
R.H.S contains 5 & 4   So $y \neq 2$
L.H.S > R.H.S   So x < y and $x \neq y$ also
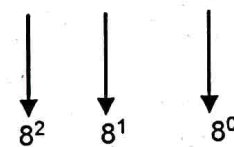The possible values of x and y are given below.

x	y	Reason
8	10 or 16	x<y & x≠ y
10	16	

Case I
Let x = 8 and y = 10
$(1 \quad 0 \quad 2)_8$ $> (42)_{10}$

$8^2 \quad 8^1 \quad 8^0$

So when x = 8 then y $\neq$ 10

Case II
Let x =8 and y = 16
$1 \quad 0 \quad 2$ $= 1 \times 8^2 + 0 \times 8^1 + 2 \times 8^0$

$8^2 \quad 8^1 \quad 8^0$

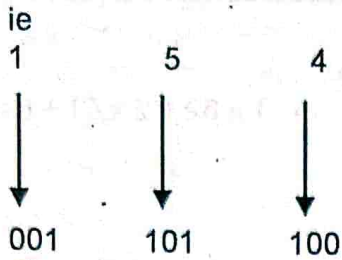$= 64 + 0 + 2$
$= (66)_{10}$
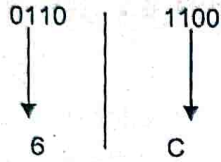$(4 \quad 2)_{16}$ $= 4 \times 16 + 2 \times 16^0$

$16^1 \quad 16^0$

$= 64 \times 2 = (66)_{10}$

So   x = 8 and y = 16
then we have fo find the hexadecimal equivalent of $(154)_8$ For this first convert this into binary thus again convert it into hexadecimal. First write down the 3 bit equivalent of 154.

ie

1	5	4
↓	↓	↓
001	101	100

Then divide this number into groups of 4 bits starting from the right and write down the hexa decimal equivalent.

0110	1100
↓	↓
6	C

So the result is $(154)_8 = (6C)_{16}$

Qn. 9

Fill up the missing digit.   (Score 3)

വിട്ടു പോയത് പൂരിപ്പിക്കുക.

If $(121)_a = (441)_b$ then $(121)b = (\ )_{10}$

Ans L.H.S. contains 2.   So $a \neq 2$

R.H.S. contains 4   so $b \neq 2$

L.H.S. < R.H.S.   So a>b and a b also.

Hence the values of a can be 10 or 16.

The values of b can be 8 or 10.

The possible values of a and b are given below.

a	b	Reason
16	10 or 8	a>b and a≠b
10	8 only	

Case I : Let a=16 and b = 10

$(121)_{16} = (289)_{10}$). So $b \neq 10$

Case II : Let a = 16 and b=8

$(121)_{16} = (289)_{10}$

$(441)_8 = 4 \times 8^2 + 4 \times 8^1 + 1 \times 8^0$

= 256+32+1

= $(289)_{10}$

So a =16 and b=8.

Then $(121)8 = 1 \times 82 + 2 \times 81 + 1 \times 80$

= 64 + 16 + 1 = $(81)_{10}$

Qn. 10

Fill up the missing digit.   (Score 3)

വിട്ടു പോയത് പൂരിപ്പിക്കുക.

If $(128)_a = (450)_b$ then $(16)_a = (\ )_{10}$

Ans L.H.S. contains 2 & 8. So a 2 and $a \neq 8$.

R.H.S. contains 4 and 5. So $b \neq 2$.

L.H.S. < R.H.S. so a>b and $a \neq b$ also.

The possible values of a and b are given below.

a	b	Reason
10	8 only	a>b and a ≠ b
16	8 or 10	a>b and a ≠ b

Case I: a=16 and b=8

$(128)_{16} = (296)_{10}$

$(450)_8 = (296)_{10}$

So a = 16 and b=8.

Then $(16)_{16} = 1 \times 16 + 6 \times 16^0 = (22)_{10}$