32 16 8 4 2 1

Q:2- marks:5

Consider a system with a 6 bit virtual address space, and 16 byte pages/frames. The mapping from virtual page numbers to physical frame numbers of a process is (0,8), (1,11), (2,7), and (3,1). Translate the following virtual addresses to physical addresses by indicating frame number and offset number. Note that all addresses are in decimal. You have to write your answer in decimal and binary.

(a) 23

(b) 42

f#	p#
8	0
11	1
7	2
1	3

23 binary conversion

a) $(23)_{10} = (1\ 0\ 1\ 1\ 1)_2$

6 bits

P = 2	d = 4

Virtual address

page/frame size = 16 bytes = 2^4

6	5	4	3	2	1
0	1	0	1	1	1

d = 0 1 1 1 => 7 in decimal

P = 0 1 => 1 page number.

Now logical to physical conversion by looking at page Table:-

P = 01 , f = $(11)_{10}$ => $(1\ 0\ 1\ 1)_2$ in binary

after translation to physical address

d = 0 1 1 1

1011	0111
11 8 6 4	8 4 2 1

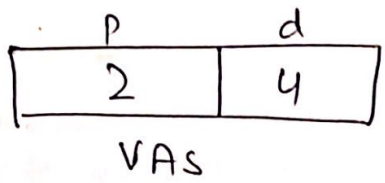
physical address.

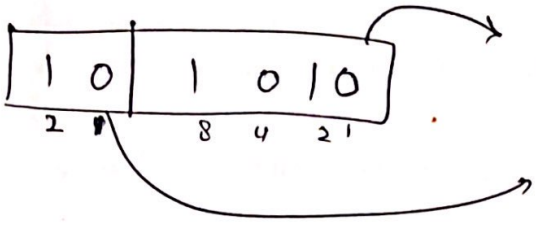
converting these bits to decimal:-

128 + 32 + 16 + 4 + 2 + 1 = 183 in decimal

and 1011 0111 in binary.

(b) $(42)_{10}$ = $(1\ 0\ 1\ 0\ 1\ 0)_2$ (32 16 8 4 2 1)



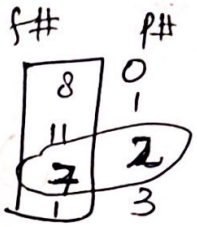


displacement #

d = 1010 = (10)

P = 10 = Page# = 2

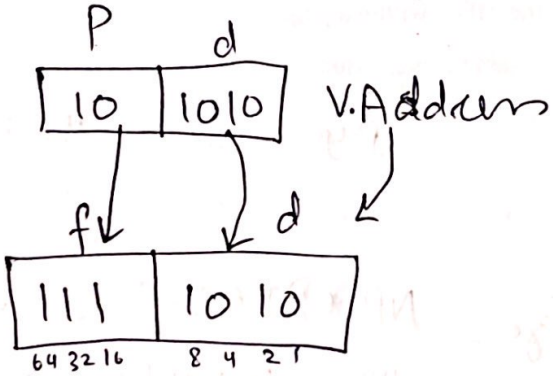
Converting P# to f# lets look at page Table.



Page Table

page # 2 → frame # $(7)_{10}$

$(111)_2$



64 + 32 + 16 + 8 + 2 = $(122)_{10}$ decimal value for (42). logical addrss.