8.6 a. Split binary address into virtual page number and offset; use VPN as index into page table; extract page frame number; concatenate offset to get physical memory address

b. (i) 1052 = 1024 + 28 maps to
VPN 1 in PFN 7, ($7 \times 1024+28 = 7196$)

(ii) 2221 = 2×1024 + 173 maps to VPN 2, page fault

(iii) 5499 = 5×1024 + 379 maps to
VPN 5 in PFN 0, ($0 \times 1024+379 = 379$)

8.8 In both the cases, there are 8 page transfers. This implies that increasing the number of page frames does not always reduce the number of page transfers.

8.9 A total of fifteen pages are referenced, the hit ratios are:

N	1	2	3	4	5	6
Ratio	0/15	1/15	2/15	7/15	9/15	9/15

8.11 The machine language version of this program, loaded in main memory starting at address 4000, might appear as:

```
4000       (R1) ← ONE            Establish index register for i
4001       (R1) ← n              Establish n in R2
4002       compare R1, R2        Test i > n
4003       branch greater 4009
4004       (R3) ← B(R1)          Access B[i] using index register R1
4005       (R3) ← (R3) + C(R1)   Add C[i] using index register R1
4006       A(R1) ← (R3)          Store sum in A[i] using index register R1
4007       (R1) ← (R1) + ONE     Increment i
4008       branch 4002
6000-6999  storage for A
7000-7999  storage for B
8000-8999  storage for C
9000       storage for ONE
9001       storage for n
```

The reference string generated by this loop is

$$494944(47484649444)^{1000}$$

consisting of over 11,000 references, but involving only five distinct pages.