1.

Hard link 為檔案的真實連結，紀錄著該檔案的 inode 資訊，沒有 hard link 就無法存取該檔案，但 hard link 無法跨磁碟分割。

Symbolic link 可跨分割、可指向資料夾，但他僅只是一個文字字串所構成的檔案，紀錄目標的檔案的相對或絕對路徑，當目標檔案被移動時，連結仍存在但是會指向一個不存在的檔案。

2.

Without optimization:

Cost time = transfer time + seek time + rotational latency

=100*20 + 100*5 + 100*10 = 2000 + 500 + 1000 = 3500(msec)

With optimization:

Cost time = transfer time + seek time + rotational latency

=100*20 + 100 +100*10 = 2000 + 100 + 1000 = 3100(msec)

3.

Frames	LRU	Optimal
1	20	20
2	18	15
3	15	11
4	10	8
5	8	7
6	7	7
7	7	7

4.

	Contiguous	Linked	Indexed
a	201	1	1
b	101	52	1
c	1	3	1
d	198	1	0
e	98	52	0

5.

The virtual address in binary form is 0001 0001 0001 0010 0011 0100 0101 0110 Since the page size is 2^12, the page table size is 2^20. Therefore the low order 12 bits 0100 0101 0110 are used as the displacement into the page, while the remaining

20 bits 0001 0001 0001 0010 0011 are used as the displacement in the page table. The offset bits are then concatenated to the resulting physical page number (from the page table), to form the final address.