Consider a computer system with a 30-bit logical address and 4-KB page size. The system supports up to 512 MB of physical memory and each page table entry is 4 Bytes. How many entries are there in each of the following settings? Please show the details.

a. A conventional single-level page table?

b. An inverted page table?

c. The best two-level hierarchical page table (hint: each second-level page table should be fit into one page)?

30 -bit==>2^30 Bytes –logical memory space

The size of the page is 4KB = 2^12Bytes

Due to the amount of the memory = 512MB

= 2^29bytes

So, number of pages =2^30/2^12

= 2^18 pages

Number of frames = 2^29/2^12

= 2^17

1. A traditional one-level table is the number of entries = 2^18
2. Number of inverted page tables entered =2^17
3. Table of Page Input = 4 Bytes = 2^5 bits

Number of single page entries = 2^12 / 2^5 = 27

Total virtual memory is 2^30 in which half the values store page id, and other store id.

So total entries is 2^15 \* 2^7 = 2^22 entries