date . . No.

1. 64 MB physical memory , 32 bits logical address space

page size 4KB , entry 4 bytes

(a) $2^{32} / 4KB = 2^{32} / 2^{12} = 2^{20}$

$2^{20} \times 4$ bytes = 4 MB #

(b) 256 entries = 2^8 entries

p	d
20	12

20 - 8 = 12

$2^8 \times 4$ bytes = 1 KB (first level)

$2^{12} \times 4$ bytes = 16 KB (second level) # 1KB + 16KB = 17 KB #

(c) 28×4 bytes = 112 bytes #

(d) $64MB = 64 \times 2^{10} KB$

$64 \times 2^{10} / 4 = 16 \times 2^{10}$

$16 \times 2^{10} \times 4 = 64 \times 2^{10}$ bytes = 64KB #

2. (a) $(100-86) + (117-86) + (117-91) + (150-91) + (150-102)$

$= 14 + 31 + 26 + 59 + 48 = 178$ #

(b) $(100-102) + (102-91) + (91-86) + (117-86) + (150-117)$

$= 2 + 11 + 5 + 31 + 33 = 82$ #

(c) $(100-91) + (91-86) + (86-0) + (102-0) + (117-102) + (150-102)$

$= 100 + 150 = 250$ #

(d) $100 + (199-102) + (199-0)$

$= 100 + 97 + 199 = 396$ #

(e) $(100-86) + (150-86) = 14 + 64 = 78$ #

Ïhý uú

date . . No.

3. (a) 4 (b) 2 (c) 1 (d) 3 (e) 5

4. 0C42 = 0000 1100 0100 0010

1KB = 2^{10} bytes

000011 = 3 ⇒ 0110 0111 0111
+ 0000 0100 0010
0110 1011 1001

(a) index number
= 3 #

(b) linear address
= 0110 1011 1001 #

256 bytes = 2^8 bytes 0110 1011 1001

0110 = 6 ⇒ 7 = 0111

(c) index number
= 6 #

(d) physical address
= 0111 1011 1001 #

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