1. Consider a paging system with the page table stored in memory.

   a. If a memory reference takes 50 nanoseconds, how long does a paged memory reference take?

   b. If we add TLBs, and if 75 percent of allpage-table references are found in the TLBs, what is the effective memory reference time? (Assume that finding a page-table entry in the TLBs takes 2 nanoseconds, if the entryis present.)

   Answer:

   a. ① ns

   b. ② ns

   填空题 (14 分)　　0 分　　(请按题目中的空缺顺序依次填写答案)

   ① 50　　　　　　　　　　　　　　　　　　回答错误

   ② 14　　　　　　　　　　　　　　　　　　回答错误

   正确答案:

   ① 100

   ② 64.5

2. Given six memory partitions of 100 MB, 170 MB,40 MB, 205 MB, 300 MB, and 185 MB (in order), how would the **first-fit, best-fit, and worst-fit** algorithms place processes of size 200 MB, 15 MB, 185 MB, 75 MB, 175 MB, and 80 MB (in order)?

   请在下面空中依次填写答案。如果某进程能放入到空闲分区中，填写该分区的数字，如：100；如果某进程无法放入到空闲分区中，则填写：must wait

   First-fit:

   a. 200M process put in ① M partition

   b. 15M process put in ② M partition

   c. 185M process put in ③ M partition

   d. 75M process put in ④ M partition

   e. 175M process must ⑤ M partition

   f. 80M process put in ⑥ M partition

   Best-fit

   a. 200M process put in ⑦ M partition

   b. 15M process put in ⑧ M partition

   c. 185M process put in ⑨ M partition

   d. 75M process put in ⑩ M partition

   e. 175M process put in ⑪ M partition

   f. 80M process put in ⑫ M partition

   Worst-fit:

   a. 200M process put in ⑬ M partition

   b. 15M process put in ⑭ M partition

   c. 185M process put in ⑮ M partition

   d. 75M process put in ⑯ M partition

   e. 175M process ⑰ M partition

   f. 80M process put in ⑱ M partition

   填空题 (18 分)　　14 分　　(请按题目中的空缺顺序依次填写答案)

① 205

② 100

③ 300

④ 100

⑤ 185

⑥ 170

⑦ 205

⑧ 40

⑨ 185

⑩ 100

⑪ 300

⑫ 170　回答错误

⑬ 300

⑭ 205

⑮ 185　回答错误

⑯ 170　回答错误

⑰ must wait

⑱ 100　回答错误

正确答案:
① 205
② 100
③ 300
④ 100
⑤ 185
⑥ 170
⑦ 205
⑧ 40
⑨ 185
⑩ 100
⑪ 300
⑫ 300
⑬ 300
⑭ 205
⑮ 205

3. Assuming a 1-KB page size, what are the page numbers and offsets for the following address references (provided as decimal numbers):

请在下面空中依次填写十进制数值答案

a. 3085   page numbers: ___①___ , offsets: ___②___

b. 42095   page numbers: ___③___ , offsets: ___④___

c. 215201   page numbers: ___⑤___ , offsets: ___⑥___

填空题 (18 分)   18 分   (请按题目中的空缺顺序依次填写答案)

①   3

②   13

③   41

④   111

⑤   210

⑥   161

正确答案:
① 3
② 13
③ 41
④ 111
⑤ 210
⑥ 161

4. The BTV operating system has a 21-bit virtual address, yet on certain embedded devices, it has only a 16-bit physical address. It also has a 2-KB page size. How many entries are there in each of the following?

a. A conventional, single-level page table . Answer: ___①___ (填写10进制数)

b. An inverted page table.   Answer: ___②___ (填写10进制数)

填空题 (16 分)   16 分   (请按题目中的空缺顺序依次填写答案)

①   1024

②   32

正确答案:
① 1024
② 32

5. Consider a logical address space of 256pages with a 4-KB page size, mapped onto a physical memory of 64 frames.
   a. How many bits are required in the logical address?
   b. How many bits are required in the physical address?
   Answer:
   a. Logical address: ①   bits
   b. Physical address: ②   bits

填空题 (14 分)   7 分   (请按题目中的空缺顺序依次填写答案)

① 20

② 14   回答错误

正确答案:
① 20
② 18

6. Considering thesegment table, what are the physical addresses for the following logicaladdresses?

   Segment Base Length
   0   219   600
   1   2300 14
   2   90   100
   3   1327 580
   4   1952 96

   What are the physical addresses for the following logical addresses?（Physical addresses = Segment Base Address + Offset）
   请在下面空中依次填写十进制数值答案，如果是无效地址，请填写：**invalid。**
   a. 0,430   Answer: ①
   b. 1,10   Answer: ②
   c. 2,500   Answer: ③
   d. 3,400   Answer: ④
   e. 4,112   Answer: ⑤

填空题 (20 分)   20 分   (请按题目中的空缺顺序依次填写答案)

① 649

② 2310

③ invalid

④ 1727

⑤ invalid

正确答案:
① 649
② 2310
③ invalid
④ 1727
⑤ invalid