1. Assume that you have a page-referencestring for a process with ***m*** frames(initially all empty). The page-reference string has length ***p***; and ***n*** distinctpage numbers occur in it. Answer these questions for any page-replacement algorithms:
   a. What is a lower bound on the number of page faults?
   b. What is an upper bound on the number of page faults?
   Answer:
   a. _____
   b. _____

填空题 (10 分)　10 分　(请按题目中的空缺顺序依次填写答案)

(1) n

(2) p

正确答案:

(1) n

(2) p

2. Considerthe page table for a system with 12-bit virtual and physical addresses and256-byte pages.

Page	Page Frame
0	–
1	0x2
2	0xC
3	0xA
4	–
5	0x4
6	0x3
7	–
8	0xB
9	0x0

   The list of free pageframes is 0x0*D*, 0x0*E*, 0x0*F* (that is, 0x0*D* is at the head of the list, 0x0*E* is second, and 0x0*F* is last). A dash for apage frame indicates that the page is not in memory.
   Convert the followingvirtual addresses to their equivalent physical addresses in hexadecimal. Allnumbers are given in hexadecimal.
   a. 0x9EF
   b. 0x111
   c. 0x700
   d. 0x0FF
   Answer(不需要再输入0x,填写三位十六进制数):
   a. 0x_____
   b. 0x_____
   c. 0x_____
   d. 0x_____

填空题 (10 分)　10 分　(请按题目中的空缺顺序依次填写答案)

(1) 0EF

(2) 211

(3) D00

(4) EFF

正确答案:

(1) 0EF

(2) 211

(3) D00

(4) EFF

3. Consider the followingpage reference string:

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3,6.

How many page faults would occur for the followingreplacement algorithms, assuming three, four frames?

Remember all framesare initially empty, so your first unique pages will all cost one fault each.

1) LRU replacement
2) FIFO replacement
3) Optimal replacement

Answer:

Number of frames	LRU	FIFO	Optimal
3	_____	_____	_____
4	_____	_____	_____

注：前面三个空格填写three frames 缺页次数, 后面三个空格填four frames 缺页次数

填空题 (10 分) 10 分 (请按题目中的空缺顺序依次填写答案)

(1) 15

(2) 16

(3) 11

(4) 10

(5) 14

(6) 8

正确答案:

(1) 15

(2) 16

(3) 11

(4) 10

(5) 14

(6) 8

4. Consider the two-dimensional array A:
int A[][] = new int[100][100];
where A[0][0] is at location 200 in apaged memory system with pages of size 200. A small process that manipulates the matrix resides in page 0 (locations 0 to 199). Thus, every instruction fetch will be from page 0. For three page frames, howmany page faults are generated by the following array-initialization loops,using LRU replacement and assuming that page frame 1 contains the process and the other two are initially empty?
a.
for (int j = 0;j < 100; j++)
for (int i = 0; i < 100; i++)
A[i][j] = 0;
b.
for (int i = 0; i < 100; i++)
for (int j = 0; j < 100; j++)
A[i][j] = 0;
Answer:
a. _____ page faults
b. _____ page faults

填空题 (10 分) 0 分 (请按题目中的空缺顺序依次填写答案)

(1) 50000 回答错误

(2) 500 回答错误

正确答案:

(1) 5000

(2) 50

5. _____ memory allocation scheme may produce external fragmentation.

单选题 (3 分) 3分

A. Demand

B. system halts

C. Multiple-partition

D. None of above

正确答案: C

6. A demand paging system adopts the LRU page replacement algorithm. Consider a reference string 1 8 1 7 8 2 7 2 1 8 3 8 2 13 1 7 1 3 7. The total number of page faults given 4 initially empty page frames is _____.

单选题 (3 分) 3分

A. 4

B. 5

C. 6

D. 7

正确答案: C

7. After a page fault handled, _____should be executed.

单选题 (3 分) 3分

A. the instruction just before interruption

B. the instruction caused interruption

C. the instruction just after interruption

D. The first instruction of this process

正确答案: B

8. Assume that the probability of page faultis 0.1%, memory access time is 100ns, and the average page fault service timeis 25 ms, then the effective access time is _____.

单选题 (3 分) 3分

A. 125μs

B. 115ms

C. 25μs

D. 25ms

正确答案: C

9. Considering a system, which uses virtual memory. At what point can address binding be done?

单选题 (3 分) 3分

A. compile time

B. loadtime

C. execution time

D. canbe any of the above

正确答案: C

10. Consider a paging system that mappes logical address space of 8 pages with 1024 bytes each page to a physical memoryof 32 frames, the logical address is of ___ and the physical address is of ___.

单选题 (3 分) 3分

A. 10bits, 5 bits

B. 3bits, 15 bits

C. 13bits ,5 bits

D. 13bits, 15 bits

正确答案: D

11. Dynamic relocation relies on ____.

单选题 (3 分)　3分

A. arelocation register

B. object code

C. dynamic link libraries

D. relocation program

正确答案: A

12. In a paging memory management system, thereis a page table as following:
If the page size is 4KB, then paging address hardware will convert logical address 10 into physical address _____。

Page No.	Frame No.
0	2
1	1
2	6
3	3
4	7

单选题 (3 分)　3分

A. 8202

B. 4106

C. 2058

D. 1034

正确答案: A

13. assume that a task is divided into 4equal-sized segments, and that the system builds an 8-entry page table for each segment. Therefore, the system has a combination of segmentation and paging.Assume also that the page size is 2Kbytes.
What is the maximum size of each segment?

单选题 (3 分)　3分

A. 2Kbytes

B. 4Kbytes

C. 8Kbytes

D. 16Kbytes

正确答案: D

14. assume that a task is divided into 4equal-sized segments, and that the system builds an 8-entry page table for eachsegment. Therefore, the system has a combination of segmentation and paging.Assume also that the page size is 2Kbytes.
What is the maximum logical address spacefor the task?

单选题 (3 分) 3分

A. 8Kbytes

B. 16Kbytes

C. 32Kbytes

D. 64Kbytes

正确答案: D

15. 为使虚存系统有效地发挥其预期的作用，所运行的程序应具有的特性是__。

单选题 (3 分) 3分

A. 该程序不应含有过多的I/O操作

B. 该程序的大小不应超过实际的内存容量

C. 该程序应具有较好的局部性（Locality）

D. 该程序的指令相关不应过多

正确答案: C

16. 总体上说，请求分页(demand-paging)是个很好的虚拟内存管理策略。但是，有些程序设计技术并不适合于这种环境。例如，_____。

单选题 (3 分) 3分

A. 堆栈

B. 线性搜索

C. 矢量运算

D. 二分法搜索

正确答案: D

17. 考虑页面置换算法，系统有m个页帧供调度，初始时全空；引用串长度为p，包含了n个不同的页面，无论用什么缺页算法，缺页次数不会少于_____。

单选题 (3 分) 3分

A. m

B. p

C. n

D. min(m,n)

正确答案: C

18. 首次适应算法的空闲区是_____。

单选题 (3 分)　3分

A. 按地址递增顺序连在一起

B. 始端指针表指向最大空闲区

C. 按大小递增顺序连在一起

D. 寻找从最大空闲区开始

正确答案: A

19. 下述_____页淘汰算法会产生Belady现象。

单选题 (3 分)　3分

A. 先进先出

B. 最近最少使用

C. 最不经常使用

D. 最佳页面置换

正确答案: A

20. 在虚拟分页存储管理系统中，若进程访问的页面不在主存，且主存中没有可用的空闲帧时，系统正确的处理顺序为_____。

单选题 (3 分)　3分

A. 决定淘汰页→页面调出→缺页中断→页面调入

B. 决定淘汰页→页面调入→缺页中断→页面调出

C. 缺页中断→决定淘汰页→页面调出→页面调入

D. 缺页中断→决定淘汰页→页面调入→页面调出

正确答案: C

21. Implementing LRU precisely in an OS is expensive, so practical implementations often use an approximation called .

单选题 (3 分)　3分

A. MRU

B. MFU

C. LFU

D. NRU

正确答案: D

22. The second-chance (clock) algorithm is anefficient approximation technique for _____.

单选题 (3 分)　3分

A. LRU page replacement

B. LFU page replacement

C. benchmarking file system performance

D. benchmarking raw disk I/O performance

正确答案: A

23. Which of the following memory management is not suitable for a multi-programming environment?

单选题 (3 分)　3分

A. single contiguous memory allocation

B. fix-sized partitions allocation

C. variable-sized partitions allocation

D. segmentation with paging

正确答案: A

24. Suppose that the TLB has a 90% hit ratio,if the times for TLB searching is 20 nanoseconds, access memory is 100 nanoseconds, what is the effective emory-access time?

单选题 (3 分)　3分

A. 120nanoseconds

B. 130nanoseconds

C. 140nanoseconds

D. 220nanoseconds

正确答案: B