Multiple Choice (5 points each)

1. Increasing the RAM of a computer typically improves performance because _____.
   - A. virtual memory increases
   - B. larger RAMs are faster
   - C. fewer page faults occur
   - D. fewer segmentation faults occur

2. On media that uses constant linear velocity, the _____.
   - A. disk's rotation speed increases as the head moves towards the middle of the disk from either side
   - B. disk's rotation speed remains constant
   - C. density of bits decreases from the inner tracks to the outer tracks
   - D. density of bits per track is uniform

3. With segmentation, a logical address consists of _____.
   - A. segment number and offset
   - B. segment name and offset
   - C. segment number and page number
   - D. segment table and segment number

4. Which of the following data structures is appropriate for placing into its own segment?
   - A. heap
   - B. kernel code and data
   - C. user code and data
   - D. all of the above

5. Assume the value of the base and limit registers are 1200 and 350 respectively. Which of the following addresses is legal?
   - A. 355
   - B. 1200

C. 1551

D. all of the above

6. Which of the following statements are true with respect to hashed page tables?

    A. They only work for sparse address spaces.

    B. The virtual address is used to hash into the hash table.

    C. A common approach for handling address spaces larger than 32 bits.

    D. Hash table collisions do not occur because of the importance of paging.

7. Which of the following is a benefit of allowing a program that is only partially in memory to execute?

    A. Programs can be written to use more memory than is available in physical memory.

    B. CPU utilization and throughput is increased.

    C. Less I/O is needed to load or swap each user program into memory.

    D. All of the above

8. Suppose we have the following page accesses: 1 2 3 4 2 3 4 1 2 1 1 3 1 4 and that there are three frames within our system. Using the LRU replacement algorithm, what is the number of page faults for the given reference string?

    A. 14

    B. 8

    C. 13

    D. 10

9. What size segment will be allocated for a 39 KB request on a system using the Buddy system for kernel memory allocation?

    A. 39 KB

    B. 42 KB

    C. 64 KB

    D. None of the above

10. Which of the following is the simplest method for implementing a directory?

    A. tree data structure

    B. linear list

    C. hash table

    D. nonlinear list

Which of the following statements is false?

Please go on to the next page.

A. Virtual memory implements the translation of a program's address space into physical memory address space.

B. Virtual memory allows each program to exceed the size of the primary memory.

C. Virtual memory increases the degree of multiprogramming

D. Virtual memory reduces the context switching overhead.

12. DMA controllers _____.

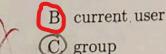   A. do not utilize an additional, special purpose, processor

    B. are a nonstandard component in PCs of today

    C. can steal memory access cycles from the main CPU

    D. can access main memory at the same time as the main CPU

13. Consider a disk queue holding requests to the following cylinders in the listed order: 116, 22, 3, 11, 75, 185, 100, 87. Using the SCAN scheduling algorithm, what is the order that the requests are serviced, assuming the disk head is at cylinder 88 and moving upward through the cylinders?

    A. 116 - 22 - 3 - 11 - 75 - 185 - 100 - 87

    B. 100 - 116 - 185 - 87 - 75 - 22 - 11 - 3

    C. 87 - 75 - 100 - 116 - 185 - 22 - 11 - 3

    D. 100 - 116 - 185 - 3 - 11 - 22 - 75 - 87

14. Which of the following disk head scheduling algorithms does not take into account the current position of the disk head?

    A. FCFS

    B. SSTF

    C. SCAN

    D. LOOK

15. Which of the following is not considered a classification of users in connection with each file?

    A. owner

    B. current user

    C. group

    D. world

16. Which of the following allocation m   ns   or   s needed to get a disk block using direct access?

    A. linked allocation

B. indexed allocation

C. hashed allocation

D. contiguous allocation

17. A disk with free blocks 0,1,5,9,15 would be represented with what bit map?

  A. 0011101110111110

  B. 1100010001000001

  C. 0100010001000001

  D. 1100010001000000

18. Which algorithm is considered reasonable for managing a buffer cache?

  A. least-recently-used (LRU)

  B. first-in-first-out (FIFO)

  C. most-recently-used

  D. least-frequently-used (LFU)

True or False (2 points each)

19. True/False __I__ In general, LOOK disk head scheduling will involve less movement of the disk heads than SCAN disk head scheduling.

20. True/False __T/F__ A relative path name begins at the root.

21. True/False __F__ Inverted page tables require each process to have its own page table.

22. True/False __F__ Linked allocation suffers from external fragmentation.

23. True/False __T/F__ Indexed allocation may require substantial overhead for its index block.

1.c - fewer page faults
2.d - density of bits per track is uniform
3.a - segment number and offset
4.d - all of the above
5.b - 1200
6.c - a common approach for handling addres
larger than 32 bits
7.d - all of the above
8.c - 8
9.c - 64kb
10.c - hashtable
11.d - virtual memory reduces the context sv
overhead
12.a - do not utilize an additional, specia.
purpose, processor
13.b - 100- 116- 185-87-75-22-11-3
14.a - FCFS
15.b - current user
16.d - contigous allocation
17.b - 1100010001000001 (1 means free 0 mear
allocated)
18.d - Least-frequently-used (LFU)

19.t
20.f
21.f
22.f
23.f