CS6233_Final - Spring 2021

Part 1 Memory Management

1.

When allocating memory using variable partitions, which of the following is TRUE of compaction?

- ◯ It is used to solve the problem of internal fragmentation.
- ◯ It cannot shuffle memory contents.
- ◯ It can be done at compile time.
- ◯ It is possible only if relocation is dynamic and done at execution-time.

2.

For a process running in a multitasking computer system, the number of entries the Translation Lookaside Buffer holds for that process must be equal to the number of entries in its page table.

- ◯ TRUE
- ◯ FALSE

3.

Suppose a program is operating with relocation hardware (i.e. uses a relocation register) and the physical address generated is 450. The relocation register is set to 100. What is the corresponding logical address?

- ◯ 250
- ◯ 100
- ◯ 350
- ◯ 550

4.

Assume the value of the base and limit registers are 10000 and 2000 respectively. Which of the following addresses is ILLEGAL?

- ◯ 11900
- ◯ 12500
- ◯ 10500
- ◯ 11111

5.

2. The “absolute module” is generated during ____.

- ◯ interrupt handling
- ◯ compile time
- ◯ load time
- ◯ execution time

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Assume a process has a virtual address spanning the range 0 – 0x3FF with 256-byte pages. For the page table entries below, what would be the physical address generated when the CPU core attempts to access virtual address 0x222?

0x2
0x7
0xD
0x9

Your answer

7.

Consider a logical address with a page size of 4 KB. How many bits must be used to represent the page offset in the logical address?

- ◯ 10
- ◯ 8
- ◯ 12
- ◯ 13

8.

Consider a memory paging system that uses 128 KB pages and 32-bit addresses. If a process has a logical address space spanning the range 0 – 0x10FFFF. How many entries are there in its page table?

Your answer

9.

The mapping of a logical address to a physical address is implemented in hardware by the _____.

- ◯ dynamic loading register
- ◯ memory-management-unit (MMU)
- ◯ limit register
- ◯ memory address register

Part 2 Memory Management 2

10.

With segmentation, a logical address consists of _____.

- segment number and offset
- segment table and segment number
- segment number and page number

11.

The frame fields within page tables are normally written by _____

- the hardware and the kernel software
- the user-mode software
- the kernel software
- the hardware

12.

Optimal page replacement ____.

- requires that the system keep track of previously used pages
- is used mostly for evaluating the performance of other page-replacement schemes
- is the page-replacement algorithm that is most commonly implemented in modern systems.
- can suffer from Belady's anomaly

13.

The _____ is an approximation of a program's locality.

- working set
- page fault frequency
- page replacement algorithm
- locality model

14.

A(n) _____ allows multiple processes to share the usage of the translation lookaside buffer without flushing it during context switching.

- scheduling priority
- stack
- address-space identifier
- page number

15.

The _____ allocation algorithm allocates available memory to each process according to its size.

- slab
- global
- proportional
- equal

16.

In virtual memory systems with demand paging, a program may be partially loaded into physical memory. Which of the following is NOT an advantage of partial program loading?

- Allows the use of smaller page tables
- Allows higher degree of multi-programming than the physical memory allows
- Faster load time

17.

In a paged memory system, if a process tries to access a page number that is outside the bounds of the page table, this results in _____

- ◯ TLB page miss
- ◯ segmentation miss
- ◯ segmentation fault
- ◯ page fault

18.

Which of the following is NOT a benefit of virtual memory systems with demand paging?

- ◯ CPU utilization and throughput is increased.
- ◯ Programs can be written to use more memory than is available in physical memory.
- ◯ Programs can be compiled faster
- ◯ Less I/O is needed to load or swap each user program into memory.

Part 3

Suppose we have the following page trace: 2 7 1 2 4 3 2 1 6 5 1 5 and that there are only three frames in our paged memory system

19.

Using the LRU page replacement algorithm, which pages reside in memory at the end of the page trace?

- ◯ 1,4 and 5
- ◯ 1, 2 and 5
- ◯ 1,5 and 4
- ◯ 1,5 and 6

20.

Using the LRU page replacement algorithm, what is the number of page faults?

Your answer

21.

In Round-Robin (RR) scheduling, the time quantum should be small with respect to the context-switch time.

- ◯ TRUE
- ◯ FALSE

22.

Which of the following is TRUE of cooperative scheduling?

- ◯ It requires a timer.
- ◯ It incurs a cost associated with access to shared data.
- ◯ A process keeps the CPU and releases it either by terminating or when it invokes the kernel to request I/O operations or a resource.
- ◯ A process switches from the running state to the ready state when an interrupt occurs.

23.

____ is the number of processes that are completed per time unit.

- ◯ Turnaround time
- ◯ CPU utilization
- ◯ Response time
- ◯ Throughput

Part 4

If at time 0, three process were in the system with the CPU burst times shown below, and a round-robin scheduler was used with a time quantum of 3 units

PROCESS	CPU BURST TIME
P0	9 UNITS
P1	7 UNITS
P2	13 UNITS

24.

What is the average turnaround time?

Your answer

25.

What is the average wait time?

Your answer

Part 5 Storage devices and file systems

26.

Suppose that the operating system uses two internal tables to keep track of open files. Process A has two files open and process B has three files open. One file is shared between the two processes. How many entries are in the per-process table of process A, the per-process table of process B, and the system-wide tables, respectively?

- ◯ 5, 5, 5
- ◯ 2, 3, 3
- ◯ 2, 3, 4
- ◯ 2, 3, 5

27.

Which of the following is NOT considered a file attribute?

- ◯ Size
- ◯ Resolution
- ◯ Protection
- ◯ Name

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A raw-formatted disk partition may NOT ____.

- ◯ be writable
- ◯ contain files or directories
- ◯ be used as swap space
- ◯ be directly used by a database application

29.

An acyclic-graph directory structure ____.

- ◯ is less flexible than a simple tree-structured directory structure.
- ◯ is less complicated than a simple tree-structured directory structure.
- ◯ allows a subdirectory or a file to exist in more than one directory
- ◯ does not allow a file to exist in more than one directory

30.

Which of the following is NOT considered a classification of users in connection with each file?

- owner
- current user
- others
- group

31.

Consider a disk that has 200 cylinders, numbered 0 to 199. The drive is serving a queue of requests to the following cylinders (in the listed order): 116, 22, 3, 11, 75, 185, 100, 87. assuming the disk head is at cylinder 77 and moving upward through the cylinders. what is total distance that the disk arm has traveled using the C-LOOK algorithm?

Your answer