

Final Online

Started: Apr 29 at 3:36pm

Quiz Instructions

You will have 60 minutes to complete this test. You may use 4-function calculator and scratch paper, but no other aids.

Question 1

1 pts

Suppose a Minix file has mode 751, uid=1001, and gid=17. Which of the following accesses are allowed? (Check all that apply.)

- ☐ A process with uid=25 and gid=17 attempts to read the file.
- ☐ A process with uid=25 and gid=17 attempts to write to the file.
- ☐ A process with uid=1001 and gid=12 attempts to write the file.
- ☐ A process with uid=1005 and gid=19 attempts to execute the file
- ☐ A process with uid=25 and gid=19 attempts to read the file

Question 2

1 pts

If a process calls `umask(123)`, then which of the following are true for subsequent calls? (Check all that apply.)

- ☐ `creat("foo",0777)` will create a file that cannot be written by anyone other than the owner.
- ☐ `creat("foo",0777)` will create a file that can be executed only by the owner.
- ☐ `creat("foo",0777)` will create a file that cannot be executed by anyone.
- ☐ `creat("foo",0777)` will create a file that cannot be read by anyone other than the owner and a member of the file's group.
- ☐ `creat("foo",0777)` will create a file that can be read by anyone.
- ☐ `creat("foo",0777)` will create a file that can be executed by anyone

Question 3

1 pts

Instructions to be executed by a process are located in its `{}` segment.

Question 4**1 pts**

Automatic variables that are declared inside a procedure call/method are located in the {} segment of a process.

Question 5**1 pts**

The location of the next instruction to execute after returning from a procedure call is found in the {} segment of a process.

Question 6**1 pts**

When is a spin lock solution to the critical section problem most attractive?

- ☐ When there are multiple cores and the critical section is short
- ☐ When there is a single core and the critical section is short
- ☐ When there are multiple cores and the critical section is long
- ☐ When there is a single core and the critical section is long

Question 7**1 pts**

Suppose that 5 jobs, A, B, C, D, and E, arrive at a batch processing center at times 0, 2, 4, 5, and 7, respectively. Their compute times are 7, 4, 1, 3, and 2, respectively. For SRTF scheduling, the schedule is []. (Write your answer as a string of process names without spaces, with one name per time unit - so FCFS would yield AAAAAAABBBBCDDDEE)

Question 8**1 pts**

Suppose that 5 jobs, A, B, C, D, and E, arrive at a batch processing center at times 0, 2, 4, 5, and 7, respectively. Their compute times are 7, 4, 1, 3, and 2, respectively. For CTSS scheduling, the schedule is []. (Write your answer as a string of process names without spaces, with one name per time unit - so FCFS would yield AAAAAAABBBBCDDDDDE)

Question 9**1 pts**

Suppose a coder types at 60 words per minute. Using the standard 5 character/word measure, and assuming 1 start and one stop bit, 7-bit ASCII with even parity, what is the data rate over the serial line in bps?

Question 10**1 pts**

A disk takes 2 ms per track seek time, and the head is currently on track 40. Assume it takes 6 ms to service a request once the head is at the right track. The following stream of requests arrive, given as (ID, arrival time in ms, track). When is the last request finished if the policy is SSF (aka SSTF)?

Requests: (A,3,52), (B,4,47), (C,28,60), (D,48,38), (E,62,45).

Question 11**1 pts**

A disk takes 2 ms per track seek time, and the head is currently on track 40. Assume it takes 6 ms to service a request once the head is at the right track. The following batch of requests are pending, given as (ID, track) in order of arrival. How much time does it take to service all the requests if the Elevator algorithm is used and the current direction is down?

Requests: (A,61), (B,32), (C,82), (D,40), (E,43), (F,57).

Total time = ? ms.

Question 12**1 pts**

Which initial linked list(s) could correspond the the following initial bitmap of memory unit allocation? Check all that apply.

00000111

11111111

11111000

11111100

...

☐ [H,0,5] - [P,5,8] - [P,13,8] - [H,21,3] - [P,24,6] - [H,30,9] - ...

☐ [H,0,3] - [H,3,2] - [P,5,16] - [H,21,3] - [P,24,4] - [P,28,2] - [H,30,2] - ...

☐ [H,0,5] - [P,5,16] - [H,21,3] - [P,24,6] - [H,30,1] - ...

☐ [H,0,5] - [P,5,16] - [H,21,3] - [P,24,2] - [P,26,4] - [H,30,2] - ...

☐ [H,0,5] - [P,5,10] - [P,15,2] - [P,17,4] - [H,21,3] - [P,24,4] - [P,28,2] - [H,30,6] - ...
Question 13**1 pts**

For optimal page replacement with an allocation of four page frames, not including the initial four page faults, what is the sequence of pages replaced for the following reference string? (Leave out spaces and commas, and use X if there are "don't care" values, so for FCFS the sequence would be 01234510).

01230142531021534021

Question 14

1 pts

Suppose that servicing a page fault takes an average of 40 ms. on a system that has 50 ns. RAM access time. What is the **maximum page fault rate in percent faults** that is required for the system to have mean effective access time for paged memory of no more than 250 ns.? (Do not consider cache, only effective access time for RAM accesses.)

Question 15

1 pts

The following system state is a(n) _____ state.

Exist = (2,4,1,3,4)

Max

Proc	Res 1	Res 2	Res 3	Res 4	Res 5
A	1	2	2	0	2
B	0	3	0	1	3
C	1	0	1	1	1
D	0	2	0	1	2
E	1	0	1	3	2

Has

Proc	Res 1	Res 2	Res 3	Res 4	Res 5
A	1	1	0	0	1
B	0	1	0	0	1
C	0	0	0	1	0
D	0	1	0	1	0

E 1 0 0 1 0

☐ safe

☐ unsafe

☐ neither

☐ both

Question 16**1 pts**

What is the largest file size that can be allocated if blocks hold 8192 bytes, block pointers are 32 bits, and files are stored using indexed allocation? Include units in your answer (e.g. KB, MB, GB, TB) with a space between the number and the units (e.g., 8 KB).

Question 17**1 pts**

What are strong arguments against having larger file block size? Check all that apply.

☐ The data rate for reading a block into memory is lower.

☐ It takes longer to read a block into memory.

☐ For the same amount of RAM allocated for the block cache, fewer blocks will be in the cache.

☐ External fragmentation will be higher.

Question 18**1 pts**

How many disk accesses are needed to bring byte 4090 of a file into memory when the file is stored using double indirect indexed allocation? Assume that only the file's FCB is in memory, block pointers require 32 bits, and that blocks hold 1024 bytes each.

Question 19**1 pts**

How many disk accesses are needed to bring byte 4090 of a file into memory when the file is stored using linked allocation? Assume only the file's FCB is in memory, block pointers require 32 bits, and that blocks hold 1024 bytes each.

Question 20**1 pts**

If a process in a MAC system has label <Secret, {Marketing}> files with which labels is it able to read, assuming the usual label meanings? (check all that apply)

☐ <Confidential, {Marketing}>☐ <Secret, {}>☐ <Top Secret, {Marketing}>☐ <Confidential, {Engineering, Marketing}>

Not saved

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