List of the Possible Questions

#1: What are “threads”?  
In a PPT slide

#2: How do threads reduce the high context switching overhead in processes?  
In a PPT slide

#3: How do threads reduce the high overhead of processes when processes try to share data in shared memory?  
In a PPT slide

#4: Show the typical internal structure of a process that consists of multiple threads.

#5: Show the typical internal structure of a thread.  
This question has been dropped (this question will not be asked in Quiz #7)

#6: What information do multiple threads in a process can share?  
Described in the textbook (also In a PPT slide)
#7: Can threads in a process share global variables in other processes? If yes, briefly describe how. If not, briefly explain why not.

In a PPT slide

#8: What information must be managed in TCB (thread control block, also known as “private PCB”) and what information should be still in the PCB (also known as “global PCB”)?

Described in the textbook (also In a PPT slide)

#9: Which of the following items in the PCB for a process should belong to the global PCB or TCB (private PCB)?

(a) Processor registers
(b) Program Counter (PC) register
(c) User ID
(d) Process ID
(e) The list of opened files
(f) The list of the assigned I/O devices
(g) Stack Pointer (SP) register

Described in the textbook

#10: Which of PCB (global PCB) or TCB (private PCB for each thread) do processor registers belong to? Briefly (but with a proper emphasis on the essential reason) justify your opinion.

Described in the textbook (also In a PPT slide)

#11: Which of PCB (global PCB) or TCB (private PCB for each thread) does Program Counter (PC) register belong to? Briefly (but with a proper emphasis on the essential reason) justify your opinion.

Described in the textbook (also In a PPT slide)

#12: Which of PCB (global PCB) or TCB (private PCB for each thread) does User ID (UID) information belong to? Briefly (but with a proper emphasis on the essential reason) justify your opinion.

Described in the textbook (also In a PPT slide)

#13: Most of the operating systems today includes Stack Pointer (SP) register in their private PCB (i.e., “TCB”). What are the advantages in this design? Mention at least two different advantages.

Described in the textbook (also In a PPT slide)
As we discussed in the classroom, “threads” are introduced after many system programmers were using “processes” for multi-tasking (we even discussed that “threads” were introduced to avoid two problems in “processes”). After all, while “processes” and “threads” have many things in common (and “threads” seem to be better than “processes”), then why do we still use “processes” (mention at least two different reasons)?

We will discuss this question on March 28th

What are the two different implementations of “threads”?

In a PPT slide

What are the two modes of processors?

In a PPT slide (“Processor_Modes.ppt”)

What is the primary role of a “kernel mode”?

In a PPT slide (“Processor_Modes.ppt”)

What is the primary role of a “user mode”?

In a PPT slide (“Processor_Modes.ppt”)

Which of the following(s) can a processor in the user mode perform?

(a) Preempt a process (in the running state) in the short-term scheduling.
(b) Read the value of the “real-time clock”.
(c) Read the contents in a file at a local storage device
(d) Kill a processes under multitasking OSes
(e) None of the above

Described in the textbook

What are the advantages in the kernel-mode threads?

Discussed on 3/23 (please see your lecture note), when we discussed the table in Question #18 below.
#17: What are the advantages in the user-mode threads?

Discussed on 3/23 (please see your lecture note), when we discussed the table in Question #18 below.

#18: Complete the following table that compares the user-mode and kernel-mode threads.

<table>
<thead>
<tr>
<th>Factors</th>
<th>User-Mode</th>
<th>Kernel-Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preemptive thread scheduling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robustness</td>
<td></td>
<td></td>
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<tr>
<td>Execution speed</td>
<td></td>
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<tr>
<td>Portability</td>
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<td></td>
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</tbody>
</table>

Discussed on 3/23 (please see your lecture note).