(1) What is “user mode” of a processor?

In the user mode of a processor, a processor can execute only the instructions that:
- do not directly access hardware
- do not access memory addresses that do not belong to own user-application process

OR

In the user mode of a processor, there are some restrictions about the types of the instruction a processor can execute.

(2) What are “threads”?

Threads are sets of program codes (or “execution paths” or “modules of instructions”) in a process, each of which are for performing a well-defined functions (or activities) in parallel. Each thread would be just a process in the OSes that do not support threads.

(3) What are the two inefficiency problems in “processes”?

① Context-switching overhead

② System call overhead in accessing shared information
(4) How do threads reduce the high context switching overhead in processes?

Threads reduce the high context-switching overhead by switching only small portion of the PCBs, when a processor is switched from a thread to another. Since the amount of the information is switched is reduced, the context-switching will be faster.

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

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