

3. (12 p)

- (a) (4 p) Explain what Direct Memory Access is and why it can improve CPU utilization.

[**HINT:** Please refer to the slides of the corresponding lecture (I/O System)]

- (b) (4 p) Discuss why the timer interrupt is a key component of a modern OS.

[**HINT:** e.g., marking the end of each quantum to support the scheduler.]

- (c) (4 p) Discuss how the information is stored on disk and accessed by the hardware of a computer during the booting process when multiple OSes are installed.

[**HINT:** Please refer to the slides of the corresponding lecture (File Systems). In this case a boot loader is needed.]