Review Questions and Problems Chapter 5

1. Give examples for some *foreground/background systems* and explain what the foreground and background tasks are.

2. Explain the three types of *exceptions* and how they work.

3. Why would you need a *hardware timer* rather than measuring time via software loops?

4. Give three reasons why *C* is still the most used *programming language* for real-time systems. Does C have support for real-time built into the language? Give some examples for other real-time programming languages.

5. Give three examples for *MISRA rules* and explain the rationale behind these rules.

6. What are *guards* in the context of C-language programs, and what are they good for?

7. Is it good practice to define *variables* in *C header files*? Please explain.

8. Explain what a *reentrant function* is, and give an example for a function that is not reentrant.

9. Explain the layer structure for the AUTOSAR run-time environment. What parts of the layer are definitely hardware-specific?

10. It is good practice to *develop real-time software* such that it is portable and can be run as much as possible on a *standard workstation* or *PC*. For this we had defined a *directory structure* with a folder for the application part of the software and some other folders. Explain the purpose of this structure and the function of each folders.

11. Some older C compilers allow nested comments. Write a C program that finds out if it is being run on such a compiler without any error messages. Try to make this program as short as possible.