29/09/23 Assignment

1) What are device driver?

Ans) Device drivers are software programs that enable communication between an operating system (like windows, macOS, linux) and hardware devices (printers, keyboards)

→ They act as intermediaries, translating high level operating system commands into specific instructions that the hardware can understand and execute

→ Device drivers are essential for proper device functionality and ensure that the hardware components work seamlessly with the operating system

→ They provide the necessary instructions and translation services to bridge the gap between software and hardware, allowing users to utilize their devices effectively.

② Difference between general purpose system vs Embedded system Rtos vs general purpose os ?

Ans :

① Purpose :

*) General purpose systems : These are designed for a wide range of applications and can run various software programs

Ex : Desktop computers and servers

*) Embedded system Rtos : These are purpose-built for specific functions or tasks and are often integrated into a larger systems

Ex : microcontrolers, automotive control systems

*) General Purpose O.S : It is an Operat-ing system intended to run a multitude of applications on a broad selection of hardware enabling a user to run one or more applications simultaneously

Ex : microsoft windows and Linux

③ How can hardware understand the code we write in embedded systems (.c file to .exe file)

Ans:

In embedded systems, the process of turning the written code (c or c++ code) into executable code involves certain steps

1) Writing code : write the source code for your embedded system application

2) compilation : the source code is passed through a compiler (eg: GCC for C/C++) which translates high-level code into machine-readable code

3) Assembly and Linking:

→ the assembly code is then converted into binary machine code

→ the linker also combines your code with any necessary resources

4) Generating Executable (eg: .hex/.bin)

→ the output of the compilation and linking process is often an executable file. with common formats include (.hex/.bin) files

5) flashing the microcontroller :

The generated executable is loaded onto the embedded system's non-volatile memory using a hardware programmer

→ this step writes the machine code directly to microcontroller's memory

6) Execution :

Once the machine code is stored in the microcontroller's memory, and the Microcontroller's Central Processing Unit (CPU) can fetch and execute these instructions directly.

→ the hardware interprets these instructions to perform the specified operations