Embedded System

Homework 5

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Q.1 Find out the standard parallel interface in your laptop.

There is no any standard parallel interface in my laptop. But many businesses still use traditional impact printers using dot-matrix or daisy wheel technology to print multi-part forms. Because these printers are relatively rare and hard to find, many choose to continue using old printers. This becomes problematic because, while old printers connect via the IEEE-1284 parallel port interface, very few current laptop computers still have parallel ports. While these two standards may seem incompatible, adding a USB to parallel adapter lets new computers work with old printers.

The IEEE 1284 parallel interface standard is the prevalent standard for connecting a computer to a printer or certain other devices over a parallel (eight bits of data at a time) physical and electrical interface . The physical connection is similar to the older Centronics interface, which it continues to support.

Q.2 Write about PCI and ISA.

Peripheral Component Interconnect (**PCI**) is a local computer bus for attaching hardware devices in a computer and is part of the PCI Local Bus standard. The PCI bus supports the functions found on a processor bus but in a standardized format that is independent of any given processor's native bus. Devices connected to the PCI bus appear to a bus master to be connected directly to its own bus and are assigned addresses in the processor's address space.[4] It is a parallel bus, synchronous to a single bus clock.

ISA stands for "Industry Standard Architecture." ISA is a type of bus used in PCs for adding expansion cards. For example, an ISA slot may be used to add a video card, a network card, or an extra serial port. The original 8-bit version of PCI uses a 62 pin connection and supports clock speeds of 8 and 33 MHz. 16-bit PCI uses 98 pins and supports the same clock speeds.

Q.3 Find the difference between industrial computers (industry standard architecture) and normal desktop.

The basic difference between regular, desktop PCs used in office environments and specialized industrial PCs is the construction.

Industrial PCs are built to be more rugged and reliable with protections from common environmental contaminants such as dust, debris and even water, as well as containing features to minimize effects from shock and vibration. They are also designed to handle extremes in temperature and humidity. PCs housed in such industrial enclosures can easily survive and function in factory environments and other areas where they're exposed to harsh conditions.

PCs for general or office use are just not designed in the same way and to the same requirements. As a result, the more durable industrial PCs often cost more than regular PCs.

Industrial PCs achieve added ruggedness and durability by design. For instance, on the electronics side, PC board components will have broader temperature ratings. There may also be added protections from electromagnetic interference (EMI) and radio frequency interference (RFI) issues, which could affect signal integrity for data transmission. Even though EMI/RFI is present in an office setting, typically it isn't as big an issue as a factory floor environment where the presence of electric motors and other sources of electrical noise makes EMI/RFI much more of a concern, warranting countermeasures such as special shielding and gasketing.

Q.4 Find out all operating systems which are made for real time operation.

Real-time operating system (RTOS) is an operating system intended to serve real time application that process data as it comes in, mostly without buffer delay. In a RTOS, Processing time requirement are calculated in tenths of seconds increments of time. It is time-bound system that can be defined as fixed time constraints. In this type of system, processing must be done inside the specified constraints. Otherwise, the system will fail.

Some of the most widely used RTOS are:

- LynxOS
- OSE
- QNX
- RT Linux
- VxWorks

- Windows CE