

## Assignment-2

1) write the procedure to control a sensor through a web page with an example?

- ① The generic Sensor API is a set of interfaces which expose sensor devices to the web platform. The API consists of the base interfaces and set of concrete sensor classes built on top. Having a base interface simplifies the implementation and specification process for the concrete sensor classes. For instance, take a look at a class. It is super tiny. The core functionality is specified by the base interface, & gyroscope merely extend it with three attributes representing angular velocity. Some sensor classes implement the actual hardware sensors such as for example, the accelerometer (or) gyroscope classes. These are referred to as low-level sensors. Other sensors, referred to as fusion sensors, merge

data from Server level Sensors to expose other sensors referred as fusion sensors. merge data from server level sensors to expose information a script would otherwise need to calculate. for example the absolute inclination sensor provides a ready to use form by four notation matrix based on the data obtained from the accelerometer , gyroscope & magnetometer.

You might think that the web Platform already provides data and you are absolutely right. for instance, and events expose motion sensor data.

Comparing to the existing interfaces Generic Sensor API provides a great no. of advantages.

- \* Generic Sensor API is a sensor framework that can be easily extended with new sensor classes and each of these classes will keep the generic interface

- \* you can detect whether a sensor is available on platform or not.
- \* sensor reading have high precision timestamps enabling better synchronization with other activities.

② List out the differences between the microprocessor and micro controller?

④ Micro Processor:

- \* Micro processor is heart of computer systems.
- \* It is only one processor, so memory & I/O component need to be connected externally, so the circuit becomes large.
- \* You can't use it in compact system.
- \* Cost of the entire system is high.
- \* Due to external components the total power consumption is high. Therefore, it is not ideal for devices running.

on stored power like batteries.

- \* It is mainly used in personal computer
- \* Most of the microprocessors don't have power like batteries.
- \* It is based on Von Neumann model.
- \* It is a central processing unit on a single silicon based integrated chip.
- \* It is complex & expensive.

### Microcontroller

- \* Microcontroller is the heart of embedded system.
- \* Microcontroller has a processor along with internal memory and I/O component.
- \* Memory and I/O are already present, and the internal circuit is small.
- \* You can use it in compact system.
- \* Cost of the entire system is low.
- \* As, external components are low, total power consumption is less. So it can be used with devices running on stored power like batteries.

- \* Most of the microcontroller offers power saving mode.
- \* It is used mainly in a washing machine, MP3 players & embedded systems
- \* Microcontroller has more registers hence the programmes are easier to write.
- \* Microcontroller are based on Harvard architecture.
- \* It is used on internal controlling bus.

③ Draw the architecture of 8051 and explain all its features.

① 8051 micro controller is designed by Intel in 1981. It is an 8 bit microcontroller. It is built with 40 pins DIP (dual inline package), 4KB of ROM storage and 128 bytes of RAM storage. It consists of few parallel 8-16 bit parts, which are programmable as well as addressable as per requirement. An on-chip crystal oscillator is integrated in the

microcontroller having Crystal frequency of 12 MHz.

Let us now discuss the architecture of 8051 Microcontroller.

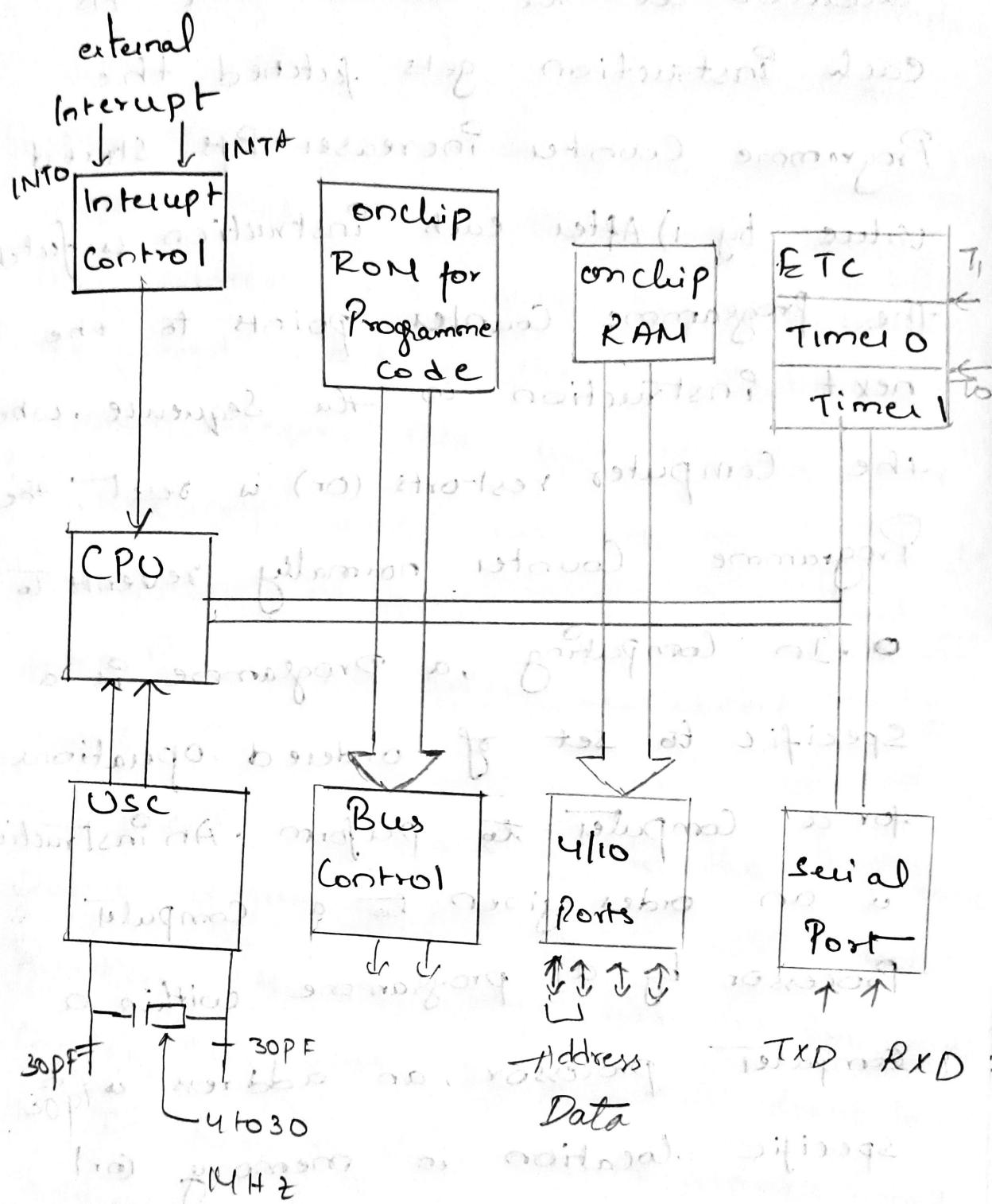
- \* In the following diagram, the system bus connects all the support devices to the CPU. The system bus consists of 8-bit data bus, a 16-bit address bus & bus control signals.

All other devices like programme memory, Ports, data memory, serial interface, interrupt control, timers and the CPU are all interfaced together through system bus.

- \* It is designed by Intel in 1981. It is an 8-bit micro controller. It is built with 40 pin x (DIP) 4KB of ROM storage and 128 bytes of RAM storage, 2, 16 bit timers. It consists of four parallel 8-bit timers. It consists of four parallel 8-bit Ports, which are programmable.

as well as addressable by PC

requirement



- ④ What is Programme Counter and how it will work?

A Programme Counter is a register in a

Computer processor that consists the address location of the instruction being executed at the current time. As each instruction gets fetched, the Programme Counter increases & its stored value by 1) After each instruction is fetched, the Programme Counter points to the next instruction in the sequence. When the computer restarts (or) is reset, the Programme Counter normally reverts to

- a. In computing, a programme is a specific set of ordered operations for a computer, to perform. An instruction is an order given to a computer processor by a programme within a computer. processor, an address is a specific location in memory (or) storage. A register is one of small set of data holding that the processor uses.

b. Some engineers refers to Programme

Counter as an instruction register (or) address pointer.

Assuming a 32 bit processor then instructions are words, that is every instruction is composed of 4 bytes. That implies that the bottom two bits of the address are byte offsets within the word, that is the address

10001111 denotes 4th byte of the word at 10001000 when we are taking about instructions, however, we will need to fetch individual bytes we want whole words.

Different textbooks handle the Programme Counter differently but given which ever Paladion you are using has the Programme Counter incremented by 1, that leads to me to believe that the PC stores word address rather than byte address then if, the Programme Counter is 10001111 and we increment by 1, we do get byte address (so we can fetch the

instructions from memory) In shorts if the programme counter is at 1000<sub>1111</sub>, then the byte address of instruction we will actually be.

5) what is difference between URN & URL

① URL is also known as web address  
Identifies a web resource as well as its location on a computer network and how to access.

An uniform resource locator is a unique identifier used to locate a resource on the Internet. It is also referred to as web address.

URL consists of multiple parts including protocol & domain name that tell a web browser how and where to retrieve a resource. End user can enter URLs by typing them directly onto the address bar of browser or by clicking a hyperlink found on web page, bookmark list in an email (or) from another

application.

The URL contains name of the needed to access a resource, as well as a resource name. The first part of URL identifies what protocol to use a primary access medium. The second part identifies (or) domain name possibility subdomain where the resource is located.

### URN:-

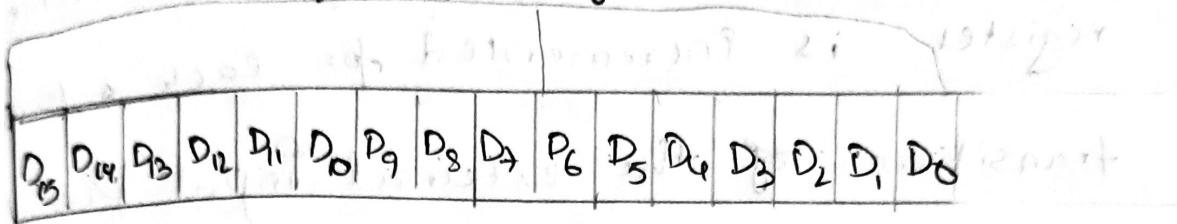
A uniform resources identifiers name is resource identifiers that uses the URN are globally unique persistent identifiers assigned for a long period of time even after the resource which they identify cease to exist for becomes unavailable. URN cannot be used to directly locate an item and need to be directly reversable, as they are simplified templates that are their part may use to find item. The development of networked information requires reliable way to resources on network. The Internet

Community has adopted the term Uniform Resource Name for a name that identifies a resource (or) unit of information independent of its location. URN are globally unique, Persistent and accessible over the network. The concept of universal names has been warmly embraced by networking and library communities, but convergence on the proved difficult.

⑥ Explain the terms of timers and counters in 8051?

① The 8051 has two timers :- timer O and timer A. They can be used either as timers (or) as counters. Both timers are 16 bit wide. Since the 8051 has an 8-bit architecture each 16 bit is accessed as two separate registers of low byte and high type. First we shall discuss about timer O registers. Timer O register is a

16 bit register and accessed as low type and high type. The low byte and high byte. The low byte is referred to as TLO and high byte is referred to as THO. These registers can be accessed like any other register.



Timer 0 register:- is also a 16 bit register and is split into two bytes referred as TLO and THO.

In Intel 8051 there are two 16 bit timer registers. These registers are known as Timer 0 and Timer 1. The timer register can be used into the two modes. These modes. The only difference between these two mode is the source for incrementing the timer register.

In timer mode, the internal machine cycle are counted. so this register is incremented in each machine cycle so when the able a clock

frequency at 12MHz then the timer register is incremented by each millisecond. In this mode it ignores the external timer input pin. In the counter mode, the external events are counted. In this mode, the time register is incremented for each  $\rightarrow$  transition of the external input pin.

This type of transition is treated as events the external pin are sampled once in each machine cycle, and to determine the 1 (or) 0 transition in another machine cycle will be needed. So, in this mode, at least two machine cycles are needed. When the frequency is 12MHz then the maximum count frequency will be  $12 \text{ MHz} / 2 \text{ Hz}$ .