**Assembly Programming**

**C PROGRAMMING**

1. Why do we need so much of data types in c programming if we could use only float for all number related operations?
2. This is done in order to save memory because of the following reasons:
3. 1. Since Atmega 32 and other microcontrollers have limited amount of memory and float data type consumes 8 byte.
4. 2. Also the range of the Atmega 32 is upto 0x7FFF. Thus we need lesser range for counters.
5. Therefore unsigned char and int data type are used to save memory.
6. Why do we use data serialization?
7. Serialization is the process of converting an object into a stream of bytes(here into bit stream) to store the databyte or transmit it to memory. Its main purpose is to save the state of an object in order to be able to recreate it when needed. The reverse process is called deserialization.

**Timers and Interrupts**

1. How are timers used in device synchronization?
2. How do we decide which one to use poling or interrupts? What is the basis?

If the event of interest is:

1. Asynchronous
2. Urgent
3. Infrequent

then an interrupt based handler would make sense.

If the event of interest is:

1. Synchronous (i.e. you know when to expect it within a small window)
2. Not Urgent (i.e. a slow polling interval has no ill effects)
3. Frequent (i.e. majority of your polling cycles create a 'hit')

then polling might be a better fit.

Other considerations include whether you are writing a device driver for an OS or just writing bare metal code with no thread support. In bare metal situations the CPU is often just looping when it isn't busy so it might as well be polling something.

1. In AVR why don’t we directly manipulate the timer registers bits ?

Solution: In AVR we cannot directly manipulate the timer registers because they are not bit addressable.

**LCD, Keyboard, Sensors**

1. Why do we need ADC’s for fetching sensor data, can’t we use timers or interrupts for the same?
2. Why don’t we require to convert hexadecimal data to 7 segment type data for lcd usage as lcd panel displays data in 7 segment data format?