

# Assignment - 1

CSE360, section - 9

Name: IBRAHEEM IBN ANWAR

ID: 22101040

1. A Bus master in a computer system is a device that decides who will talk and who will listen on a shared ~~system~~ bus. When the bus master issues a read, data flows into the bus master. When it issues a write, data flows out from the bus master. Each bus dedicates lines to one of three duties:

Address lines: Carry the location ~~of the~~ the master wants to access,

Data lines: Carry the actual bits being transferred.

Control lines: Carry signals such as Read/write, bus request/grant, and clock.

During a DMA transfer, the DMA controller becomes the bus master

2. A bus conflict is a situation where multiple devices connected to a shared bus try to transmit data as output at the same time. There can be multiple causes of bus conflict, which are:

- \* Multiple devices using the bus as output
- \* Wait states are not maintained
- \* If an I/O device causes the bus pin to be stuck.
- \* Glitches in the system.

3. Interfacing is important in embedded systems and general computer hardware as it lets different chips or modules talk to each other safely and reliably. Good interfacing ensures the correct voltage levels, pull-ups, timing and protocol so that everything works as intended.

4. RCC is an on-chip manager that performs the following tasks:

- \* It can reset peripherals
- \* It can reset the power
- \* It can perform backup domain reset

5. A USB port can carry data and power, both in a single cable. It also allows using devices by hot-plugging. Older serial ports only allowed one to one communication, with no power transfer. Parallel ports were bulky, and allowed not hot-swap.

6. HDMI carries digital signals, which make it faster and more reliable than VGA. It also carries both audio and video signals over a single cable, which is not possible in VGA.

| 7.                 | SPI                            | I2C                          | UART                      |
|--------------------|--------------------------------|------------------------------|---------------------------|
| Communication type | Synchronous, full-duplex       | Synchronous, half duplex     | Asynchronous, full-duplex |
| Speed              | Very high                      | Moderate                     | low to moderate           |
| topology           | single master, multiple slaves | Multi-master, multi-slaves   | point to point only       |
| Data framing       | Continuous stream              | Start/stop, ACK/NAK per byte | Start/stop bits needed    |

8.  $RCC \rightarrow AHB1ENR \mid = (1 \ll 4);$   
 $RCC \rightarrow AHB1ENR \mid = (1 \ll 5);$   
 $GPIOE \rightarrow MODER \mid = (10 \ll 10) \mid = (10 \ll 22);$   
 $GPIOF \rightarrow MODER \mid = (10 \ll 10) \mid = (10 \ll 22);$   
 $GPIOE \rightarrow AFR[0] \mid = (0111 \ll 20);$   
 $GPIOE \rightarrow AFR[1] \mid = (0111 \ll 12);$   
 $GPIOF \rightarrow AFR[0] \mid = (0111 \ll 20);$   
 $GPIOF \rightarrow ARR[1] \mid = (0111 \ll 12);$