

Q1. Suppose, you need to configure GPIO Port B's pin 3 as output port. Write the registers that you need and the operation you need to execute for interfacing.

RCC, MODER
 $RCC \rightarrow APB1ENR |= 1 \ll 3;$
 $MODER \rightarrow 1 \ll 6;$

Q2. Suppose, you need to configure GPIO Port A's pin 5 as input port. Write the registers that you need and the operation you need to execute for interfacing.

RCC, MODER
 $RCC \rightarrow APB1ENR |= 1 \ll 0;$
 $MODER \rightarrow 0 \ll 10;$

Q3. Suppose, you need to configure GPIO Port D's pin 3 as output port. You need to send the data at "Fast Speed" and your output type should follow an open drain system. Write the registers that you need and the operation you need to execute for interfacing.

RCC, MODER
 Other, Otyper

① $RCC \rightarrow APB1ENR |= 1 \ll 3;$
 ② $MODER \rightarrow 1 \ll 6;$ ③ $Otyper \rightarrow 1 \ll 2;$
 ④ $Otyper \rightarrow 2 \ll 6;$

Q4. $RCC \rightarrow AHB1ENR |= (1 \ll 2);$ // To enable/ activate GPIOx
 $RCC \rightarrow AHB1ENR |= (1 \ll 3);$ // To enable/ activate GPIOy
 $GPIOx \rightarrow MODER |= 1 \ll 2;$ // Setting up the mode of pins
 $GPIOy \rightarrow MODER |= 1 \ll 3;$ // Setting up the mode of pins

- Identify which GPIO ports are we enabling for communication.
- Identify which pin are we enabling of GPIOx? State the mode of the pin as well.
- Identify which pin are we enabling of GPIOy? State the mode of the pin as well.

Q5. $RCC \rightarrow AHB1ENR |= (1 \ll 1);$
 $RCC \rightarrow AHB1ENR |= (1 \ll 3);$

$RCC \rightarrow AHB1ENR |= (1 \ll 4);$
 After executing the commands what will be the which port will be enabled?

- data packages:
- The parallel port speed can range from 50 Kbps to 150 Kbps and can go up to 2 Mbps.
 - The 2 Mbps speed is achieved when the EPP and ECP modes are used as a 32 or 16 bit transfer interface who uses a 8 bit IN / OUT hardware.

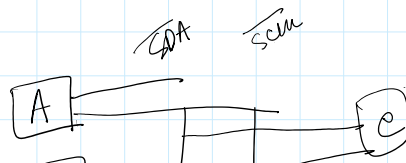
1. CO1
- For parallel ports, the speed ranges from 50 to 150 kbps. Name the two modes that can be used to reach speeds of up to 2 Mbps using the same port.
 - Explain how glitches and wait states can cause bus conflict.
 - State the purpose of Calibration Circuit and Driver in Hardware Interfacing.
 - Explain the difference between Firewire port and Ethernet port in their working mechanisms and usage.

Firewire
 ① Port Transceiver
 ② Port Transceiver
 ③ Port Transceiver
 ④ Port Transceiver
 ⑤ Port Transceiver
 ⑥ Port Transceiver
 ⑦ Port Transceiver
 ⑧ Port Transceiver
 ⑨ Port Transceiver
 ⑩ Port Transceiver

EPP (Enhanced parallel port)
 ECP (Extended capabilities port)
 wait - needed for CPU, mem to some otherwise sync miss
 glitch - immediate fault can cause two service pins to be retracted.

Calibration
 → D - A
 A →
 Driver - offhome
 interface and format

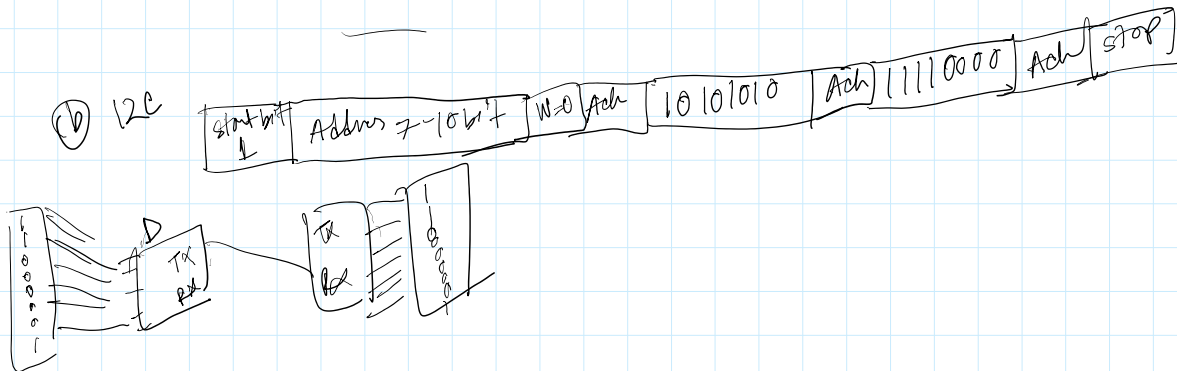
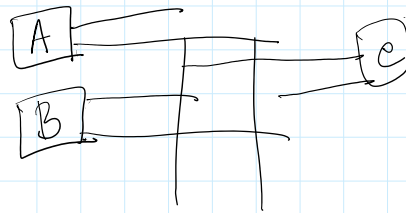
2. CO2 Two different sets of communication protocols are used to communicate between devices A, B, C and D. Where A and B are considered to be master devices while device C is considered to be a slave device and they transfer data in between them using only two wires. The other device D, communicates with device C through a different protocol where both devices D and C send/receive parallel data to and from the protocol interface. Between the two used protocols, only one of the protocols needs clock synchronization.



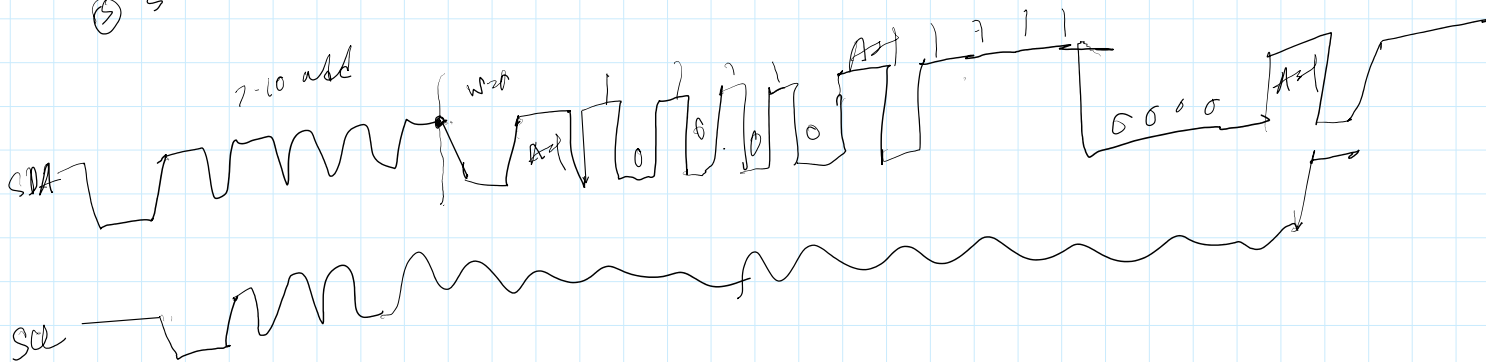
devices A, B, C and D. Where A and B are considered to be master devices while device C is considered to be a slave device and they transfer data in between them using only two wires. The other device D, communicates with device C through a different protocol where both devices D and C send/receive parallel data to and from the protocol interface. Between the two used protocols, only one of the protocols needs clock synchronization.

- Write the name of the communication protocol used between D and C and illustrate the connection diagram between D and C with pin names of the receiving and transmitting modules and explain all the steps of the data packet flow to send the data "11000001".
- Write the name of the communication protocol used between A and C. Assuming device A wants to send two 8 bit characters "10101010" and "11110000" to device C. Discuss the whole process of this data transmission using the communication protocol between A and C. Use an illustration to support your answer.

- Write the advantage and disadvantage of using Daisy Chain configuration in SPI (Serial Peripheral Interface).



- ① $\overline{SDA} = 0$
↳ send address, initialize
- ② set $\overline{SCL} = 0$
get Ack
- ③ send data
- ④ $\overline{SDA} = 1$
- ⑤ $\overline{SCL} = 1$



② Daisy chain
| D13
| All device go

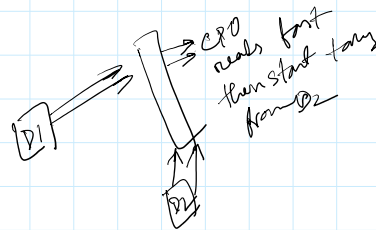
② Daisy chain

- ① Master checks
- ② only one SS pin
- ③ At a time send to mul device

Dis

- ① All device go the data
- ② One device loss all loss
- ③ No send
- ④ Slow

1. CO1
- a) List 4 differences between Serial and Parallel transmission. 2
 - b) State the significance of maintaining wait-states during data transmission using an example. 1.5
 - c) State the significance of each bus of the system bus, in the bus tri-state. 1.5
 - d) Parallel port by default acts as a unidirectional gateway for transferring data. How can it be programmed to work as a bidirectional gateway working in full duplex mode. 1



1. CO1
- a) Previously PS2 Port was used for connecting mouse and keyboard. Identify the port. 1.5
 - b) Suppose, you want to play an Online game on your PC. To play the game you need some arrangements such as a display monitor and microphone so that you can communicate with your teammates during the game and also a stable Internet connection to avoid any sort of interruption. Name the port you will connect with your display monitor to play the game effectively with your teammates. Describe with proper reasons. 1.5
 - c) Now, your ISP needs to provide the Internet connection through long distance. State with proper reasons which port will be used for the connection. What material will be suitable for the port wire? 2
 - d) State the differences between Serial Transmission and Parallel Transmission. 2

USB
→ play and play
reliably
no easy to use
HDMI

- | Serial | Parallel |
|------------------------------------|----------------------------|
| ① slow | ① Fast |
| ② 1 bit at a time | ② Data packets |
| ③ only send next bit make prev bit | ③ all bits send in a cycle |
| ④ needs buffer | ④ Direct send |
| ⑤ High security | ⑤ low security |
| ⑥ No data loss | ⑥ Data loss |
| ⑦ long distance | ⑦ short data |

(b) 1.00

① long distance

② small data

③ full duplex

④ short 1

⑤ large data

⑥ half duplex