

CSE 360: Computer InterfacingCircle the correct answer option for questions 1-6

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Section: 7

1. In which protocol you think all the devices has same priority. No master slave relation is required??
 - a) SPI
 - ☒ b) I2C
 - ☒ c) UART
 - d) Daisy Chain Configuration
2. In synchronous data transmission, which protocol is preferred where error free data is the main concern?
 - a) SPI
 - ☒ b) I2C
 - c) UART
 - d) Daisy Chain Configuration
3. How can Master or slave check that the receiver has successfully received the transmitted data in SPI??
 - ☒ a) No mechanism in SPI to acknowledge successful transmission
 - ☒ b) with ACK//NACK bits
 - c) There is stop condition and "syn" character indicating successful transmission of data
 - d) with parity bit
4. During a SPI transmission if a master is connected to 71 slaves in a single master multiple slave configuration how many total wires are needed?
 - ☒ a) 74
 - b) 78
 - c) 72
 - d) 73
5. Which type of data transmission do video calls have?
 - ☒ a) Synchronous
 - b) Asynchronous
 - c) Parallel
 - d) Multi threaded
6. For the data 10011000, what would be the parity bit?
 - a) 00
 - b) 11
 - c) 0
 - ☒ d) 1

Continuation ques: 7 (part 2)

When a master is transmitting data. Then both SDA and SCL wire is low. So, that means communication of one master to one slave is happening. So, the other masters, see these wires in low signal ~~knows~~ and can not start communication with other slaves. Other masters can only communicate with slave if both SDA and SCL wire is high. *mention false stop condition protection as well*

7. (CO2) Which protocol would you use where the data is transmitted for a synchronous transmission with multiple masters, explain the step-by-step process for the transmission. Explain how the masters know when to send data without conflict. [6 Marks]

I would use I2C protocol because it allows multiple master-slave relationship.

I2C Protocol: I2C protocol uses only 2 wires SDA and SCL. SDA for transmitting data and SCL to synchronize clock rate. It's a half-duplex mode.

When no transition is happening SDA and SCL, both are in high voltage. When a start bit (0) appears, the system understands that it has to read data.

So, After SDA is low the SCL gets low and it starts to flow with it's normal rate. Then a 7-bit slave address is sent to all the slaves. After the

8 bit (7 bit address and 1 bit start bit) received by the slaves, it matches the address with it's self. After a slave matched the address it gives

a low signal through SDA signal. It is an acknowledgement signal to let the master know that a slave address has been matched. After that

there is a read/write bit. Read is 0, write is 1. After that, data starts to transmit. 8 bits of data gets transmitted

and after that data is received by the slave it agains sends a low signal, letting the master know that 8 bit data has been received. This process continues till ~~a full data~~ transmitting the full data.

After the data transmission. There is a stop bit to let the slave know that data transmission is done. ~~Note~~ **Note**: After sending the first 8 bits SDA wire gets high and waits for a acknowledgement signal.

start bit	Address frame	Read/Write	Data frame 8 bit	Ack/NACK	Data frame	Ack/NACK	stop bit
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8. (CO2) Write the difference between full duplex and half duplex mode. Name the protocols that can work under each mode. [3 Marks]

Full duplex

① Sender and receiver can send/receive data simultaneously.

② Example: Telephone, chat room

③ Protocols: SPI, UART

Half duplex

① When sender is sending that it cannot receive data. OR receiver can not receive send data at a time.

② Example: Radio, television.

③ Protocols: I2C