Assignment 6

Chapter 10

2. True or false. 0 and 5-V digital pulses can be transferred on the telephone without being converted (modulated).

Answer:

False

11. True or false. The longer the cable, the higher the data transfer baud rate.

Answer:

False

12. State the absolute minimum number of signals needed to transfer data between two PCs connected serially. What are those?

Answer:

The simplest connection between two PCs (or PC and microcontroller) requires a minimum of three signal pins, i.e., TxD, RxD and ground.

15. Calculate the total number of bits transferred if 200 pages of ASCII data are sent using asynchronous serial data transfer. Assume a data size of 8 bits, 1 stop bit, no parity. Assume each page has 80×25 of text characters.

Answer:

200*80*25*(8+2)=400000 bits

16. In problem 15, how long will the data transfer take if the baud rate is 9600?

Answer:

T = 400000/9600 =416.667s

30. Which timer of the 8051 is used for baud rate programming?

Answer:

Timer 1

31. Which mode of the 8051 is used for baud rate programming?

Answer:

Mode 2

36. For XTAL = 11.0592MHz, find the TH1 value (in both decimal and hex) for each of the following baud rates.
(a) 9600 (b) 4800

Answer:
With = 11.0592MHz, we have:
The machine cycle frequency of the 8051 = 11.0592 MHZ/ 12 = 921.6 kHz, and 921.6 kHz/32 = 28800 Hz is the frequency provided by UART to timer 1 to set baud rate.

(a) Let SMOD=0
28800/3 = 9600 where -3 = FDH is loaded into TH1

(b) Let SMOD=0
28800/6 = 4800 where -6 = FAH is loaded into TH1

39. Write a 8051 program to transfer serially the message “The earth is but one country and mankind its citizens” continuously at 57600 baud rate.

Answer:

The maximum baud rate is 28800 where -1 = FFH is loaded into TH1. If set SMOD=1, then the baud rate will be doubled as 57600

```
            ORG 0
            MOV   TMOD,#20H          ;timer 1 mode 2(auto reload)
            MOV   TH1,#0FFH
            MOV   SCON,#C0H      ; SMOD=1, 8 bit, 1 stop, REN enable
            SETB  TR1                ; start timer 1
NEXT:       MOV   DPTR, #MY_DATA     ; load pointer for message
AGAIN:      CLR   A
            MOVC  A,@A+DPTR
            JZ    NEXT               ; if reach the character 0, then resend again
            ACALL TRANSFER           ; otherwise call TRANSFER
            INC   DPTR               ; next one
            SJMP  AGAIN
TRANSFER:   MOV   SBUF, A            ; load the data
HERE:       JNB   T1, HERE           ; stay here until last bit gone
            CLR   T1                 ; get ready for next char
            RET                      ; return to caller
MY_DATA:    DB    “The earth is but one country and mankind its citizens”, 0
            END
```