**Exam Modules7 & 8**

**Section A**

Name ID Number

**Problem1** (7 points)

Fill out the blanks (note I am looking for the best answer):

1. A timer is aseries of divide-by-two flip flops.
2. In 8051, what are the clocking sources of the timers?
   1. On-chip oscillator
   2. an external source
3. Two special function registers provide software access to the serial port, they are:
4. \_\_\_\_\_\_\_SBUF\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and
5. \_\_\_\_\_\_\_SCON\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. The baud rate in Modes 1 and 3 \_\_\_\_ is programmable (is set by timer1 overflow rate) or is variable.

**Problem2** (5 points)

Calculate TH1 reload value for the following configuration (show detailed calculation and explain):

Baud rate = 9600

Crystal frequency = 12.000 MHz

SMOD = 1

9600 = timer1 overflow rate/16

Timer1 overflow rate = 9600 \* 16 = 153600 = 153.6 KHz

1000 KHz/153.6 KHz ≈ 7 ⇒ Timer reload factor = -7 (11111001)

**Problem3** (8 points)

* + 1. Fill out the address and machine code parts **in Hex**:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Line | address | Machine code |  | Mnemonic | Operand |
| 1 |  |  |  | ORG | 8100H |
| 2 | 8100 | 758901 |  | MOV | TMOD, #01H |
| 3 | 8103 | 75BCFE | LOOP: | MOV | TH0, #0FEH |
| 4 | 8106 | 758A0C |  | MOV | TL0, #0CH |
| 5 | 8109 | D28C |  | SETB | TR0 |
| 6 | 810B | 308DFD | WAIT: | JNB | TF0, WAIT |
| 7 | 810E | C28C |  | CLR | TR0 |
| 8 | 8110 | C28D |  | CLR | TF0 |
| 9 | 8112 | B290 |  | CPL | P1.0 |
| 10 | 8114 | 80ED |  | SJMP | LOOP |
| 11 |  |  |  | END |  |

* + 1. What is the logic behind the aforementioned program (Note, I am looking for a short and concise answer)?

Timer0 is used to generate a 1KHz square wave on P1.0.