[B] Name: 游舜竹 ID: b10902011.

1. [10%] What is the purpose of C/T bit in TMOD register?

C/T=0，當 timer 用；C/T=1，當 counter 用 #

2. [10%] If we want to output 2KHz audio, its period is T=500us, and we just invert the output every (1 times) to the speaker. //hint: time

$\frac{1}{2} \cdot 10^{-3} = 5 \cdot 10^{-4}$ $5 \cdot 10^{-4} = 2kHz$

$\frac{1}{2} \frac{1}{5 \cdot 10^{-4}} = 10^{3} = 1k$

3. [10%] For Timer1 in mode 2 (an 8-bit timer with auto reload), if (TF1=1), TH1 is auto reloaded to TL1.

4. [30%] For Timer1 in mode 0 (a 13-bit timer),

(a) Assume that it will overflow after 33 time units, how to set TL1 and TH1?

(b) If TL1 is 19 and TH1 is 221, how many time units will it overflow?

(a) TL1 = (8192 - 33) % 32

TH1 = (8192 - 33) / 32

(b) 101 #

TL1 TH1

10011

32 - 19 = 13

256 - 221 = 35

5. [40%] For Timer1 in mode 2 (an 8-bit timer with auto reload) with no interrupt function, assume that TMOD, TH1 and TL1 have been set to overflow every 100 time units, if we want to design Delay(int i) function to cause a delay of i*100 time units, how to write the following Delay(int i) function.

```
void Delay(int i)
{
    TR1=(1);
    while(i>0)
    {
        while(TF1==1);   // TF1=0
        TF1=(0);
        i--;
    }
    TR1=(0);
}
```