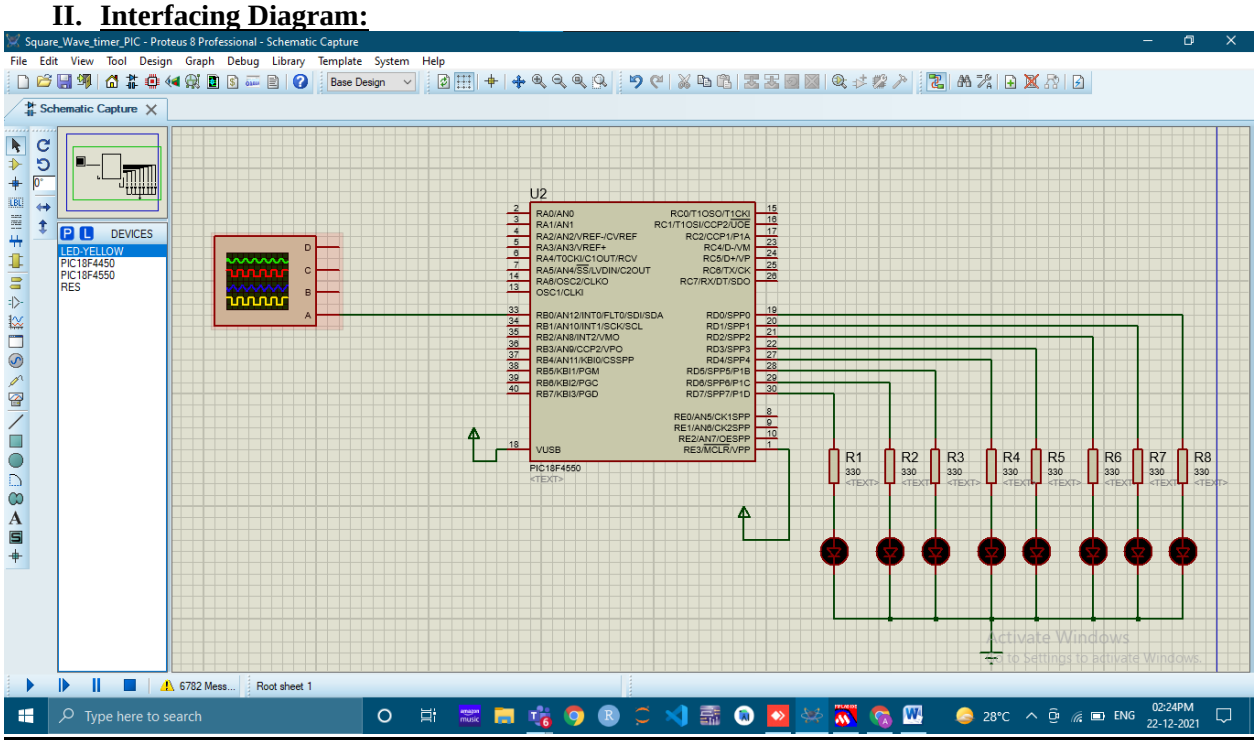
Class	**:**	**T.E (E &TC)**	**Exam**	**:**	**MC**
AY	**:**	**2021-22(Sem- I)**	**Date**	**:**	**22 / 12 / 2021**
Division	**:**	**08**	**Roll No.**	**:**	**32403**
Seat Number	**:**				
Name of the Student	**:**	**Aniket Deepak Malpure**			

I. Problem Statement:

Write an embedded C program to generate square wave of 10Hz using timer0 with interrupt and blink LEDs after a delay of 500 ms. Show detailed calculations. Draw and explain T0CON in detail.

II. Interfacing Diagram:

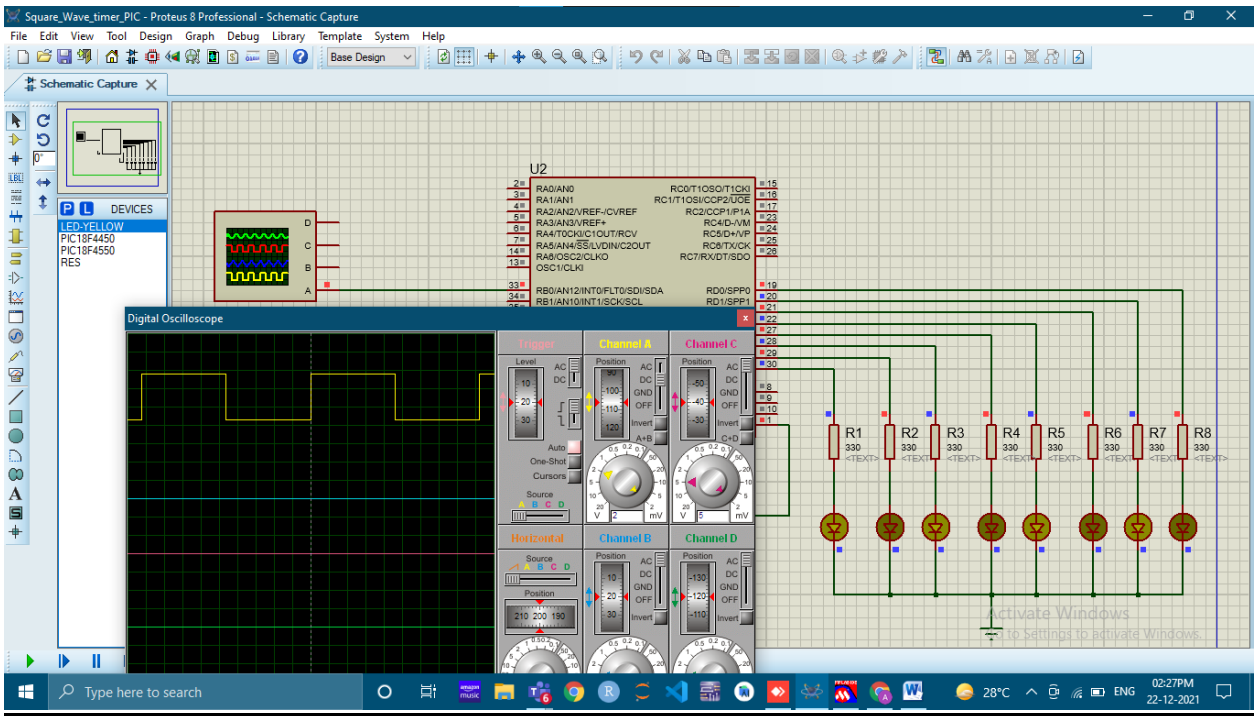


III. CODE

```
#include<P18F4550.h>
extern void _startup(void);
void delay(int d);
#pragma code _RESET_INTERRUPT_VECTOR=0X1000
void _reset(void)
{
_asm
goto _startup
_endasm
}
#pragma code
#pragma code _LOW_INTERRUPT_VECTOR = 0x1018
void low_ISR(void)
{
}
#pragma code
void timer_ISR(void);
#pragma interrupt timer_isr
void timer_isr(void)
{
TMR0H = 0x6D;
TMR0L = 0x7B;
PORTBbits.RB0 = ~PORTBbits.RB0;
INTCONbits.TMR0IF = 0;
}
#pragma code _HIGH_INTERRUPT_VECTOR = 0x1008
void high_ISR(void)
{
_asm
goto timer_isr
_endasm
}
#pragma code
void main()
{
int i;
INTCON2bits.RBPU = 0;
ADCON1 = 0x0F;
TRISBbits.TRISB0 = 0;
PORTBbits.RB0 = 0;
T0CON = 0x03;// PRESCALAR AS 16
TMR0H = 0x6D;
TMR0L = 0x7B;
INTCONbits.TMR0IF = 0;
INTCONbits.GIE = 1;
INTCONbits.TMR0IE = 1;
T0CONbits.TMR0ON = 1;
TRISD = 0X00;
while (1)
{
PORTD = 0X55;
delay(500);
```

```
PORTD = 0XAA;
delay(500);
}
}
void delay(int d)
{
int i,j;
for(i=0;i<d;i++)
{
for(j=0;j<1000;j++)
{
}
}
}
```

IV. Results(Proteus Simulation) :



V. T0CON Explanation:

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T0CON - Timer 0 Control register

D7	D6	D5	D4	D3	D2	D1	D0
TMR0ON	T08BIT	T0CS	T0SE	PSA	T0PS2	T0PS1	T0PS0

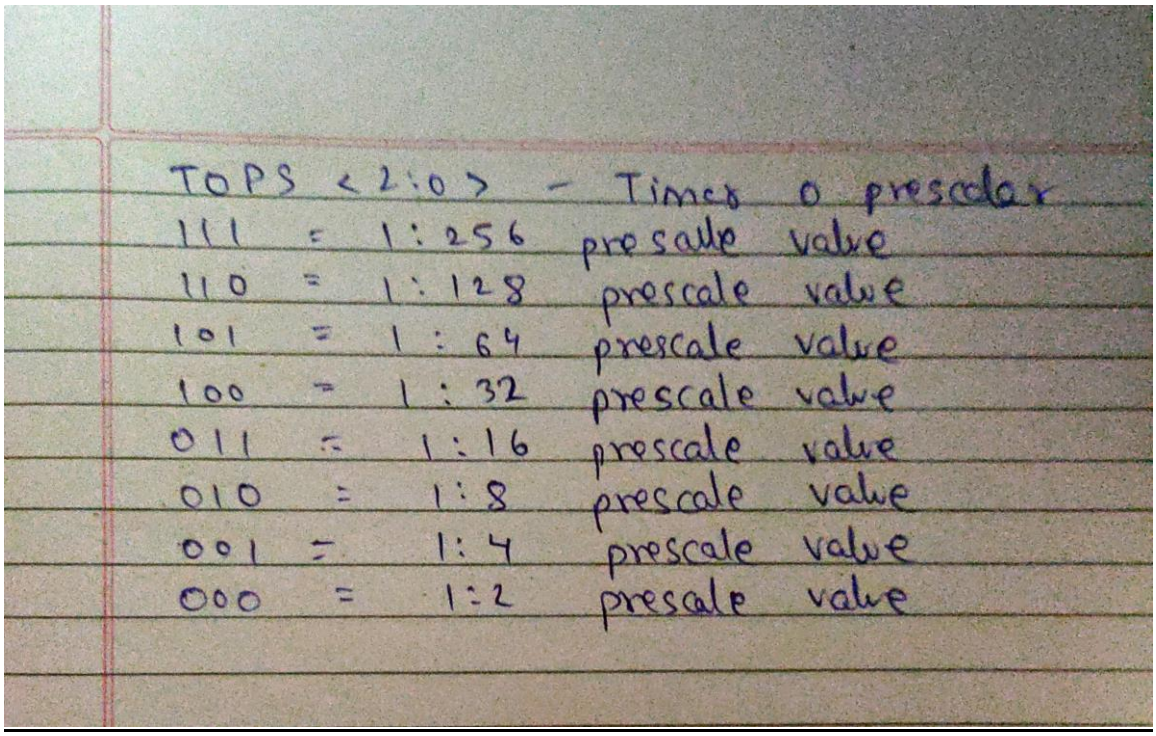
TMR0ON - Timer 0 ON/OFF Control bit
1 = Enables timer 0
0 = stops timer 0

T08BIT = Timer 0 8bit/16-bit control bit
1 = Timer 0 is configured as 8-bit
0 = Timer 0 is configured as 16-bit

T0CS - Timer 0 clock source select bit
1 = Transition on T0CKI pin
0 = Internal instruction cycle clock

T0SE - Timer 0 source edge select bit
1 = Increment on high to low transition
0 = Increment on low to high transition

PSA = Timer 0 prescalar assignment bit
1 = Timer 0 prescalar is not assigned
0 = Timer 0 prescalar is assigned.



VI. Conclusion:

In this practical I performed the experiment to generate square wave using timer0 in PIC18F4550 microcontroller. Proteus software is used to implement the circuit and to generate a hex file MPLAB software is used.