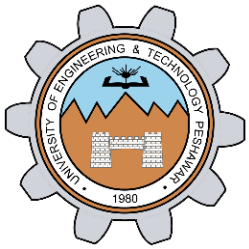
Task # 04



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Question(s):

A. Generate a signal on pin P1.1 having frequency equal to 80 Hz with a duty cycle of 10%.

B. When a user presses a button at P1.2 then frequency changes to 40Hz with a 20% duty cycle.

C. When a user again presses the same button then frequency changes to 20Hz with a duty cycle of

40%.

D. When a user again presses the same button then frequency changes to 10Hz with a duty cycle of

80%.

E. Show it on oscilloscope.

F. Each time a user presses a button the signal toggles from case A to B, then B to C, then C to D and finally from D to A, on every subsequent button press. G. Program only in C.

CODE IN C:

```
#include <reg51.h>
#include <stdio.h>
sbit mybit=P1^1;
sbit SW=P1^2;
char flag=0;

char x=0;

void start_timer(void)
{
  TR0=1;
}
void timer0_ISR(void) interrupt 1
{
  if(x==0){
    if(mybit==0){//high
          TH0=0xFB;
          TL0=0x1D;
    }
    else if(mybit==1){//low
          TH0=0xD4;
          TL0=0x0D;
    }
  }
  else if(x==1){
    if(mybit==0){//high
          TH0=0xEC;
```

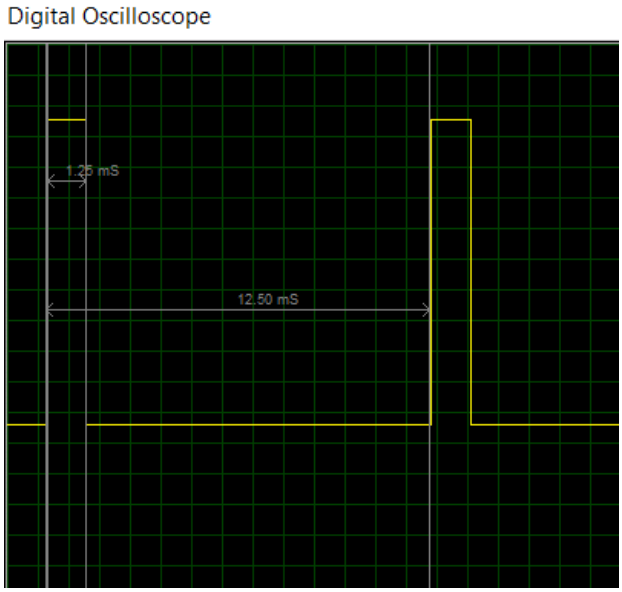
```
            TL0=0x77;
    }
    else if(mybit==1){//low
            TH0=0xB1;
            TL0=0xDF;
    }
  }
  else if(x==2)
  {
    if(mybit==0){//high
            TH0=0xB1;
            TL0=0xDF;
    }
    else if(mybit==1){//low
            TH0=0x8A;
            TL0=0xCF;
    }
  }
  else if(x==3)
  {
   if(mybit==0){//high
            TH0=0xB2;
            TL0=0xDF;
    }
    else if(mybit==1 && flag!=1){//low
            TH0=0xB1;
            TL0=0xDF;
            flag--;
    }
    flag++;
  }
  if(flag==2)
    flag=0;
  else
    mybit^=1;
}
void init_timer(void)
{
  TMOD=0x01;
  TH0=0xD8;
  TL0=0xEF;
  IE=0x82;
}

void main(void)
{
  SW=1;
```

```
  init_timer();
  start_timer();
  while(1){
    if(SW==0)
    {
          while(SW==0);
            x++;
          if(x==4)
            x=0;
    }
  }
}
```

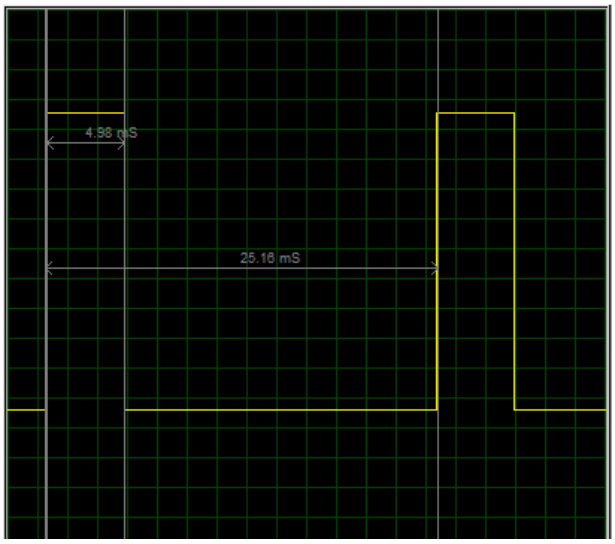
OUTPUT:

A:



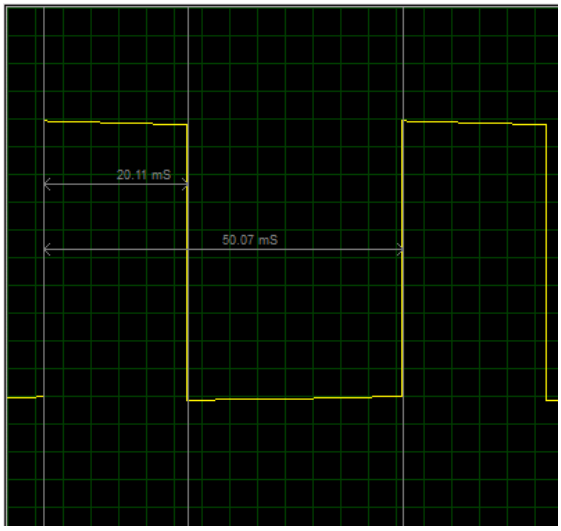
B:

Digital Oscilloscope



C:

Digital Oscilloscope



D:

Digital Oscilloscope