

Name = Sameep Vani

Roll Number = AV1940049

Major = BTech CSE

Course Code = ECE302

Course Name = Embedded System Design

Section - 1 (PART B)

Under Taking -

I certify that I have not  
violated the university code of  
conduct during examination.

S.N. Vani

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A5  $\rightarrow$  #include <avr/io.h>

```
void main()
{
    DDRA = 0x00; // Input mode
    DDRC = 0xFF; // Output mode
    int x = PINA; // Take input from PORTA.
    x += 49; // Add my roll no.
    PORTC = x; // Display on PORTC.
               as it is odd.
}
```

A6  $\rightarrow$  Explanation  $\rightarrow$  We require a Time delay of  $10 + 49 = 59 \mu s$

$$59 \times 10^{-6} = (256 - MM) \left( \frac{1}{8} \times 10^{-6} \times 8 \right)$$

$$\therefore \boxed{MM = 197}$$

$$\therefore \underline{TCNT2} = 197 = \underline{0xC5}$$

Also, DG of TIFR is checked because of Timer 2 overflow.



A6 → #include <avr/io.h>  
(Code)

```
void T2Delay()  
{
```

```
    TCNT2 = 0xC5; // Calculated before
```

```
    TCCR2 = 0x02; // Normal, 1:8 prescaling
```

```
    while ((TIFR & 0x40) == 0);
```

```
    TIFR = 0x40; // Reset flag TOV2
```

```
    TCCR2 = 0x00; // Stop clock.
```

```
}
```

```
void main()
```

```
{
```

```
    DDRB = 0xFF; // Output mode var.  
    int i, temp; // Declare required var.
```

```
    while(1)
```

```
    {
```

```
        for (i = 7; i >= 0; i--)
```

```
        {
```

```
            PORTB = 0x00; // Reset value
```

```
            temp = 1 << i; // Set ith bit
```

```
            PORTB = temp; // Display
```

```
            T2Delay(); // Apply delay.
```

```
        }
```

```
    }
```

```
}
```