Course/Lab Name: EEE4103 Microprocessor and Embedded Systems

Semester: Spring 2023-24   **Term**: Final   **Quiz**: 02F   **Total Marks**: 10   **Time**: 20 Minutes

Question Mapping with Course Outcomes:

Item	COs	POIs	K	P	A	Marks	Obtained Marks
Q1+Q2	CO1	P.a.4.C.3	K4			5+5	
					Total:	10	

Student Information:

Student Name:										Section:		B

Student ID #:										Date:	22.04.2024	Department:	
	p	q	-	a	b	c	d	e	-	r			

1. Compute the duty cycle and sketch the waveform obtained at PortD of the Arduino. Identify the modes of operation and compute the operating frequency of that mode based on the following program segment. Identify the Timer of the Arduino Microcontroller. The system clock frequency, f_{OSC} = 1a MHz. **[5]**

```
DDRD |= (1<<PD5);
OCR0B= 2pq; // Load OCR0B for setting its duty cycle
// Configure TCCR0A and TCCR0B registers for the mode and pre-scaler
pinMode(5, OUTPUT);
TCCR0A |= (1 << COM0B1) | (1<<WGM00);
TCCR0B |= (1<<WGM02) | (1<<CS01) | (1<<CS00);
```

2. Compute the duty cycle and sketch the waveform obtained at PortD of the Arduino. Identify the modes of operation and compute the operating frequency of that mode based on the following program segment. Identify the Timer of the Arduino Microcontroller. The system clock frequency, f_{OSC} = 1b MHz. **[5]**

```
DDRD |= (1<<PD5);
OCR0A = 2rb;  // Load a value in the OCR0A register
OCR0B= 1de;  // Load a value in the OCR0B register
// Configure TCCR0A and TCCR0B registers for the mode and pre-scaler
pinMode(5, OUTPUT);
TCCR0A |= (1 << COM0B1) | (1 << COM0A0) | (1<<WGM01) | (1<<WGM00);
TCCR0B |= (1<<WGM02) | (1<<CS02) | (1<<CS00);
```