AMERICAN INTERNATIONAL UNIVERSITY – BANGLADESH (AIUB)
Faculty of Engineering

Microprocessor and Embedded Systems

Assignment: 02 (MID) **Submission date**: **25.06.2022**

SL: **ID:**

NAME: **SEC:**

Instructions:
>> Upload in the dropbox link on specific date (not before or after).
>> Should be handwritten and pdf in format.
>> File name, "*SL_ID_NAME_MAES_SEC_ASSIGNMENT 02*"

01 To detect the gas leakage, an Arduino base security system is installed. This system performs a security check in a specific time interval. Apply the knowledge of Arduino to compute the required **timer counts** for the time intervals **AB** ms and **CDE** ms. The available prescalers in the system are 1, 8, 64, 256 and 1024. Which timer is required to obtain the specific delay? Consider the clock frequency 16 MHz and value of A, B, C, D, E from your ID XX-**ABCDE**-X

02 By using the concept of timer, produce **F** sec delay**.** Select an appropriate timer (TIMER0/TIMER1) and **set up the necessary registers** associated with the used timer to achieve the **F** sec time count. Consider the clock frequency 20 MHz and Prescalers value of 1024. Also, compute the maximum possible time that can be counted using this timer. Consider the value of F from your ID XX-XXXXX-**F.**

Follow the following conditions to set up the register
TIMER0
The useful bits of TCCR0A is bit 0 and bit 1, representing WGM00 and WGM01 respectively.
Bits 0 to 3 are the useful bits from TCCR0B.
Bit 3 represents WGM02.
Bits 0 to 2 represent the clock select functions CS00, CS01, CS02 respectively.

TIMER1
The useful bits of TCCR1A is bit 0 and bit 1, representing WGM01 and WGM11 respectively.
Bits 0 to 4 are the useful bits from TCCR1B.
Bits 3 and 4 represent WGM12 and WGM13 respectively.
Bits 0 to 2 represent the clock select functions CS10, CS11, CS12 respectively.

**Consider WGM = 0 for normal mode of operation. The bits not mentioned here can be ignored/considered as 0

CSx2	CSx1	CSx0	Prescaler
0	1	0	8
0	1	1	64
1	0	0	256
1	1	1	1024