

AMERICAN INTERNATIONAL UNIVERSITY – BANGLADESH (AIUB)

Faculty of Engineering

Department of Electrical and Electronic Engineering

Course/Lab Name: EEE4103 Microprocessor and Embedded Systems

Semester: Spring 2023-24 Term: Mid Quiz: 01M Total Marks: 10 Time: 20 Minutes

Question Mapping with Course Outcomes:

Item	COs	POIs	K	P	A	Marks	Obtained Marks
Q1-2	CO1	P.a.4.C.3	K4			2×5	
Total: 10							

Student Information:

Student Name:	Solve Sheet	Section:	В		
Student ID #:	Solve Sheet	Date:	12.02.2024	Department:	

1. If you want to make an LED of red color blink every 4 seconds while using an Arduino system frequency of 16 MHz using a timer to generate the delay without any application of the delay() function, which timer of the Arduino Uno is suitable for your application? You may use a prescaler value of 256 1024. Determine the necessary register set-up required for the program.

Answer:

Required delay = $4 \text{ s} = 4000000 \text{ } \mu \text{s}$

Given system frequency = 16 MHz

So, clock period = $1/\text{frequency} = 1/16 \text{ MHz} = 0.0625 \mu\text{s}$

As such, Timer Count = Required delay/(clock period×pre-scaler value) – 1

 $=4000000/(0.0625\times1024) - 1 = 62500 - 1 = 62499$

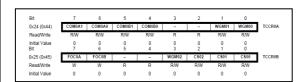
But Timer 0 can count up to 256 and Timer 1 can count up to 65,536; so Timer1 is suitable for this application.

2. For the above program, correct the following setup function:

What should be the value in the blank space?

Hints: Prescaler values and corresponding register contents.

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



[5]