Daffodil International University

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Midterm Exam Examination, Fall 2021 @ DIU Blended Learning Center

Course Code: CSE423 (Day), Course Title: Embedded Systems

Level: 4 Term: 2 Section: All

Instructor: FF Modality: Open Book Exam

Date: Saturday, 13 November 2021 Time: 01:30 pm-04:00 pm

Two and half hours (2:30 H), Marks: 25

- **You must go through every QUESTIONS very carefully here**
- **Analyze and answer specific sections based on your own thinking and work**
- **Do not share with others as this will be treated as plagiarism by Blended Learning Center**
- **Rename your script in the following format "CSE423-Your Section-182-15-ABCDE_MID.pdf"**

1. Is Arduino an embedded system? Justify your answer. Mention 5 applications of embedded systems around you. Which one is the main Microcontroller of Arduino UNO? Why this microcontroller is different from a microprocessor? Is this microcontroller having an EEPROM? What do you know about this EEPROM? **7**

2. What are the main components and characteristics of embedded systems? Distinguish between general purpose computing and embedded system computing. What are the maximum and minimum value of Digital and Analog read and write of Arduino UNO? **8**

You have 3 Sensors A, B, C. You need to read the data from A if the value is maximum 50, from B if the value is minimum 50 and from C if the value is between 20 to 50. All the data will be printed in a Serial Monitor. Write an Arduino code for this work. Use special functions without if else. Explain each function you need to implement. Give proper justification with your own words.

3. What is PWM? Which pins of Arduino can make PWM? You have 5 LEDs, a potentiometer, a push button, an Arduino, Breadboard, resistance and wires. Now for your younger brother you need to make a system that will do the followings: **10**

- If your brother rotates potentiometer P from left to right, then at first LED1 will turn on and got brightness from lowest to highest after getting LED1 highest brightness LED2 will turn on and got brightness from lowest to highest. If your brother rotates potentiometer P from right to left, then the reverse will happen.
- If your brother presses button B odd times, then LED3 to LED5 will blink one after another with half second delay. If your brother presses button B even times, then the blinking pattern will be like: blink LED3, blink LED3+LED4, blink LED3+LED4+LED5, each blink will have half second delay.
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Make a clear circuit diagram of this simple project with proper connections. Make only one Arduino code that can execute this project. Give proper justification with your own words.

😊 Best of Luck 😊