Nirma University

Institute of Technology

Semester End Examination (IR), February - 2022

B. Tech. in ME / EE / CSE, Semester-VII

2ECOE53 Arduino for Engineers

Roll No. _____ Supervisor's initial with date: _____

Time: 2 Hours Max. Marks: 50

Instructions: *1. Attempt all questions.*
2. Figures to right indicate full marks.
3. Draw neat sketches wherever necessary.
4. Assume suitable data wherever necessary and clearly indicate it.

Q-1.	**Answer the following**	**[10]**
[A] CO1,BL2	Discuss the classification of Microcontroller based on instruction set architecture.	[5]
	OR	
[A] CO1,BL2	Discuss the classification of Microcontroller based on hardware organization.	[5]
[B] CO1,BL4	Give the name of the Arduino commands for the given task in the proper syntax. I. To configure the pin behaviour. II. To set positions the cursor in the upper-left of the LCD III. To initializes the pseudo-random number generator IV. To turns off the given interrupt V. To attach the servo motor on pin 9 to servo object.	[5]
Q-2.	**Answer the following**	**[15]**
[A] CO2,BL4	Develop a logic (in term of flowchart) to design an Arduino based sunflower. Identify and list the components required to design it and write a code for your design.	[10]
	OR	
[A] CO2,BL4	Develop a logic (in term of flowchart) to design an Arduino based gesture control servo motors. Run servo motor1 during horizontal movement and second servo motor2 will run during vertical movement. Horizontal and vertical movement will be given using Gyro sensor. Write a code for your design.	[10]
[B] CO2,BL4	Differentiate between unipolar and bipolar stepper motor.	[5]
Q-3. CO3,BL3	Explain the working to I2C protocol with suitable example. Illustrate the start-stop condition and acknowledgements methods while transmitting data using I2C protocol.	**[10]**
Q-4. CO4,BL5	You have been asked to design smart dustbin using Arduino uno which is capable for following task: I. It should able to measure the garbage level (Hint: ultrasonic sensor)	**[15]**

II. Differentiate between dry and wet waste (Hint: moisture sensor)
III. Judge the presence of gases in case of fire inside it and set the alarm (hint: smoke sensor)
IV. Able to open the dustbin lead when use comes near to it and close it automatically after some time. (Hint: ultrasonic sensor and servo motor)

Make a flow chart of your logic and write a code which includes all the task of smart dustbin.
