Reg. No:

1. a) Develop a program tailored for smooth integration into a security system, particularly functioning as a visual deterrent or an active surveillance indicator. The program is expected to manage 8 LEDs, employing them as blinking indicators. Execute and validate the program using Keil and Proteus tools. Provide details on the logic and features embedded in the program to ensure its efficacy within a security system context. This task is designed to assess your proficiency in practical implementation using Keil and Proteus, with a focus on security system applications.

   b) Design and implement a C program for the LPC2148 kit to create a LED blinking pattern with a software delay routine. Execute the program on the LPC2148 microcontroller board and observe the visual output. Verify whether the LEDs are blinking similar to those used in the LPC2148 program, are commonly integrated into audio-visual equipment like speakers and amplifiers to indicate power, activity, or mute status.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

2. a) To facilitate level sensing, ultrasonic transducers utilize square wave pulses. Your task is to develop a program for the 8051 microcontroller using Keil and simulate its functionality in Proteus. The program should be engineered to generate square wave pulses optimized for a level sensor application employing ultrasonic transducers.

   b) Develop and implement a C program for the LPC2148 kit to read data from switches and display it on LEDs, simulating a scenario found in microwave ovens. Microwave ovens commonly use LED displays that interact with switches for entering and displaying cooking times, power levels, and other settings. Write and execute the program, considering the functionality where the entered data from switches is reflected on the LED display, resembling the user interaction in a microwave oven setting.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

3. a) Develop a program using Keil for the 8051 microcontroller and simulate its functionality in Proteus. The program should focus on controlling fading LEDs, with a specific emphasis on integration into wearable devices such as smartwatches, fitness trackers, or fashion accessories. Ensure that the program enables gradual changes in LED brightness, aiming to serve functional purposes while enhancing the overall aesthetics of the wearable device.

   b)Develop a C program tailored for the LPC2148 kit to count and display on LEDs, simulating a scenario found in gas stations. Gas stations commonly use 7-segment displays to indicate the amount and cost of fuel during refueling. Write and execute the program, considering the functionality where the count is incremented, displayed on the LEDs, and reset after reaching a certain limit, resembling the process of tracking fuel quantity during refueling in a gas station setting.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

4. a) Create a program using Keil for the 8051 microcontroller and simulate its operation in Proteus. Tailor the program to address the specific scenario of stepper motors in robotic systems, focusing on controlling joint movements. Consider the stepper motor's ability to move in discrete steps, which is crucial for applications requiring precise positioning in robotic mechanisms.

   b) Develop and implement a C program for the LPC2148 kit to enable serial transmission and reception using the on-chip UART. Consider the scenario where serial communication is commonly employed in barcode scanners for transmitting scanned data to computers or other systems. Write and execute the program, demonstrating the functionality of transmitting example barcode data and waiting for incoming data, simulating the interaction between a barcode scanner and a connected computer or system through UART communication.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

5. a) Develop a program using Keil for the 8051 microcontroller and simulate its functionality in Proteus. Customize the program to address the specific application scenario of relays in automotive systems. The focus should be on controlling diverse electrical functions, including engine starting, headlight activation, power window management, and cooling fan operation.
   b) In audio applications, ADC plays a critical function in converting analog audio signals from microphones or musical instruments into digital signals for subsequent processing, storage, and transmission. Additionally, create a C program that utilizes the internal ADC to display binary output on LEDs using an LPC2148 kit.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

6. a) Design a program for the 8051 microcontroller using Keil and simulate its functionality in Proteus. The program should be tailored for controlling the toggling of LEDs, which are commonly used in decorative lighting applications. The objective is to generate visual appeal suitable for different settings like festivals, parties, or as ambient lighting in home decor.

   b) Design and implement a C program for the LPC2148 kit to create a LED blinking pattern with a software delay routine. Execute the program on the LPC2148 microcontroller board and observe the visual output. Verify whether the LEDs are blinking similar to those used in the LPC2148 program, are commonly integrated into audio-visual equipment like speakers and amplifiers to indicate power, activity, or mute status.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

7. a) Write a program for the 8051 microcontroller using Keil and simulate its operation in Proteus. The program should be tailored to emulate the behavior of a digital clock, utilizing 7-segment displays. Ensure that each digit (0-9) representing the hours and minutes of the clock is displayed using separate 7-segment modules.
   b) Develop and implement a C program for the LPC2148 kit to read data from switches and display it on LEDs, simulating a scenario found in microwave ovens. Microwave ovens commonly use LED displays that interact with switches for entering and displaying cooking times, power levels, and other settings. Write and execute the program, considering the functionality where the entered data from switches is reflected on the LED display, resembling the user interaction in a microwave oven setting.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

8. a) Write a program for the 8051 microcontroller using Keil and simulate its operation in Proteus. The program should be designed to control LED chasers, with a focus on enhancing the overall visitor experience in museums and interactive exhibits. Emphasize the dynamic and visually appealing nature of LED chasers to create engaging displays that captivate visitors.
   b) Develop a C program tailored for the LPC2148 kit to count and display on LEDs, simulating a scenario found in gas stations. Gas stations commonly use 7-segment displays to indicate the amount and cost of fuel during refuelling. Write and execute the program, considering the functionality where the count is incremented, displayed on the LEDs, and reset after reaching a certain limit, resembling the process of tracking fuel quantity during refuelling in a gas station setting.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

9. a) Develop a program tailored for smooth integration into a security system, particularly functioning as a visual deterrent or an active surveillance indicator. The program is expected to manage 8 LEDs, employing them as blinking indicators. Execute and validate the program using Keil and Proteus tools. Provide details on the logic and features embedded in the program to ensure its efficacy within a security system context. This task is designed to assess your proficiency in practical implementation using Keil and Proteus, with a focus on security system applications.

   b) Develop a program to control the blinking of an LED using the Arduino Uno development board**.** The LED should blink at a regular interval, with the ability to adjust the blink rate through the program. The LED should turn on and off with a consistent pattern, demonstrating the basic functionality of output control on the Arduino platform. The program should include logic for turning the LED on for a set duration and then off for another set duration, ensuring a visible blinking effect. The blink interval should be adjustable by modifying the code or using external components like a potentiometer if required. Use the Arduino IDE to write the program and simulate or test the functionality on the Arduino Uno board.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

10. a) To facilitate level sensing, ultrasonic transducers utilize square wave pulses. Your task is to develop a program for the 8051 microcontroller using Keil and simulate its functionality in Proteus. The program should be engineered to generate square wave pulses optimized for a level sensor application employing ultrasonic transducers.

   b) Develop a program to control the fading of an LED using the Arduino Uno development board**.** The LED should gradually fade in and out by adjusting the voltage levels applied to it using a simple circuit with resistors. The program should use analog control or a basic time delay mechanism to simulate the fading effect. You can achieve this by controlling the current through the LED by turning it on and off in small steps over time, with varying delays between each step to create a gradual fading effect. Use the Arduino IDE to write and test the program on the Arduino Uno board, and verify the fading behavior through the physical LED.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

11. a) Develop a program using Keil for the 8051 microcontroller and simulate its functionality in Proteus. The program should focus on controlling fading LEDs, with a specific emphasis on integration into wearable devices such as smartwatches, fitness trackers, or fashion accessories. Ensure that the program enables gradual changes in LED brightness, aiming to serve functional purposes while enhancing the overall aesthetics of the wearable device.

    b) Develop a program to interface a water-level sensor with the Arduino Uno development board**.** The water-level sensor should be used to detect and measure the water level in a container, triggering a specific action when the water level reaches a certain threshold. The system should be able to continuously monitor the water level and update the output accordingly. The water-level sensor should be connected to the appropriate analog or digital input pin on the Arduino, and the program should process the sensor readings to trigger the corresponding actions. Use the Arduino IDE to write the program and test it on the Arduino Uno board.

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	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

12. a) Create a program using Keil for the 8051 microcontroller and simulate its operation in Proteus. Tailor the program to address the specific scenario of stepper motors in robotic systems, focusing on controlling joint movements. Consider the stepper motor's ability to move in discrete steps, which is crucial for applications requiring precise positioning in robotic mechanisms.

    b) Develop a program to interface an ultrasonic sensor with the Arduino Uno development board**.** The program should continuously read the sensor data and calculate the distance from the ultrasonic sensor to the nearest object. Based on the distance, you can program the Arduino to perform specific actions, such as turning on an LED if the object is within a certain range or triggering an alarm if the distance is too short or too far. The ultrasonic sensor should be connected to the appropriate digital pins on the Arduino Uno for triggering and echo signals, and the program should properly process these signals to calculate the distance. Use the Arduino IDE to write the program and test it on the Arduino Uno board.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

13. a) Develop a program using Keil for the 8051 microcontroller and simulate its functionality in Proteus. Customize the program to address the specific application scenario of relays in automotive systems. The focus should be on controlling diverse electrical functions, including engine starting, headlight activation, power window management, and cooling fan operation.

    b) Develop a program to interface an MQ-6 gas sensor with the Arduino Uno development board. The MQ-6 sensor should be used to detect the concentration of gases such as LPG, methane, and propane. The system should be able to trigger a specific action when the gas concentration exceeds a certain threshold, such as turning on an LED, sounding an alarm, or displaying a warning message on the serial monitor. Additionally, the program should allow calibration of the sensor for accurate readings. Use the Arduino IDE to write the program and test it on the Arduino Uno board.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							

Reg. No:

14. a) Develop a program to generate a **triangular wave** signal using Proteus for circuit simulation and waveform visualization. The triangular wave should be generated with a stable frequency and adjustable amplitude. The waveform should be displayed on an oscilloscope or similar visualization tool within Proteus to verify the correct shape and behavior of the signal. The circuit should include the necessary components to generate the triangular waveform, such as a function generator, op-amp, or other waveform generation circuits. Use Proteus for both the circuit design and simulation, ensuring that the triangular wave is accurate and consistent throughout the simulation.

    b) Develop a C program tailored for the LPC2148 kit to count and display on LEDs, simulating a scenario found in gas stations. Gas stations commonly use 7-segment displays to indicate the amount and cost of fuel during refuelling. Write and execute the program, considering the functionality where the count is incremented, displayed on the LEDs, and reset after reaching a certain limit, resembling the process of tracking fuel quantity during refuelling in a gas station setting.

	Aim, Tools, Algorithm (5+5)	**Program Coding (15+15)**	**Execution of codes (15+15)**	**Output & Result (5+5)**	**Record (10)**	**Viva (10)**	**Total (100)**
Q1							
Q2							