

[This question paper contains 2 printed pages.]

Your Roll No.:

Sr. No. of Question Paper : 15082
Unique Paper Code : 2514000022
Name of the Paper : Arduino/ Rpi App Development
Name of the Course : B. Tech. (GE)
Semester : VI

Duration: 3 Hours

Maximum Marks: 60

Instructions for Candidates

1. Write your Roll No. on the top immediately upon receipt of this question paper.
2. Attempt **five** questions in all, including **question no. 1**, which is **compulsory**.
3. Non-programmable scientific calculator is allowed.
4. **All** questions carry equal marks.

Questions

- 1.(a) Define an embedded system and explain how it is different from a microcontroller.
- 1.(b) Explain the significance of RX and TX pins in Arduino Uno?
- 1.(c) Write three common I2C devices used with Arduino
- 1.(d) How is an accelerometer different from a gyroscope?
- 1.(e) What is meant by time of flight in ultrasonic sensing?
- 1.(f) Write the PIN numbers for the DDRB and DDRD ports of Arduino.

[2×6 =12]

- 2.(a) Which microcontroller is used in Arduino? Discuss Harvard architecture in detail. [6]
- 2.(b) Explain the working principle of PWM. [2]
- 2(c) How many timer registers are there in Arduino? Explain the function of the timer and the significance of prescaler. [4]

- 3.(a)** Explain two different configurations of a seven-segment display with the help of diagram [4]
- 3.(b)** Write a program to display a decimal count on a 7-segment display using a common cathode configuration [8]
- 4.(a)** Explain the working of an inductive proximity sensor and how it is different from a capacitive proximity sensor. [8]
- 4.(b)** Explain Coriolis Effect. Which sensor is based on this effect? [4]
- 5.(a)** Explain the working of IR communication system [6]
- 5.(b)** What are the three types of devices in a Zigbee network? Explain them [3]
- 5.(c)** Explain the concept of baud rate. What baud rates are commonly supported by RS-232? [3]
- 6.(a)** Explain the working principle of an ultrasonic distance sensor with a diagram. What is the role of TRIG and ECHO pins in an ultrasonic sensor? [6]
- 6.(b)** Why is an LDR used with Arduino Uno? Which type of signal (analog/digital) does an LDR provide to Arduino?. [3]
- 6(c)** An ISR attached to INT0 takes 5 μ s to execute. Assuming interrupts cannot nest, calculate the maximum frequency of button presses that can be correctly detected. [3]

(200)