Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17EC2028** | **Duration :** | **3hrs** |
| **Sub. Name :** | **EMBEDDED SYSTEM DESIGN** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Explain the embedded lifecycle of a biometric attendance recorder with necessary diagrams. | CO2 | 10 |
| b. | Compare and contrast  i) Microprocessors  ii) Microcontrollers  iii) FPGA  iv) DSP processors  v) SoC | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Discuss the embedded lifecycle of an automatic washing machine with necessary diagram. | CO4 | 10 |
| b. | Identify 4 hardware requirements of a microwave oven. | CO3 | 4 |
| c. | Sketch the hardware block diagram of biometric attendance recorder. | CO3 | 6 |
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| 3. | a. | Design an embedded system to run a 5v, 1500 rpm DC motor at a speed of 500 rpm. List the calculations involved in choosing the relevant circuits and the controlling parameters. | CO3 | 12 |
|  | b. | Sketch the interfacing diagram of a 230v relay connected to port1 of 8051 Microcontroller. | CO4 | 8 |
| (OR) | | | | |
| 4. | a. | Explain the RS 232 protocol with a neat diagram. | CO2 | 5 |
|  | b. | Illustrate the purpose of RTC and give its interfacing diagram. | CO2 | 5 |
|  | c. | Design an embedded system which can read an analog sensor and display the 8 bit value on a seven segment display. | CO3 | 10 |
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| 5. | a. | Construct an Embedded C program to generate a 4 bit up counter with a delay in between every count . | CO5 | 10 |
|  | b. | Sketch a flowchart to read an analog sensor connected to channel 1. Use a 8 bit ADC with 4 channels. | CO5 | 10 |
| (OR) | | | | |
| 6. | a. | Construct an Embedded C program to blink an LED connected to Port 1.1 . Generate delay using timer and use interrupt for timer. | CO5 | 10 |
|  | b. | Construct an Embedded C program to send a character ‘A’ serially with a baud rate of 2400. Use Timer to generate the baudrate. | CO5 | 10 |
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| 7. | a. | Explain the working of an In Circuit Emulator (ICE) with a neat diagram. | CO6 | 10 |
|  | b. | Discuss the various software tools used for development. | CO6 | 10 |
| (OR) | | | | |
| 8. | a. | Explain the process of loading a source code into a target system. | CO6 | 12 |
|  | b. | Discuss the methods to program a chip. | CO6 | 8 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Differentiate between queues and pipes. | CO5 | 6 |
|  | b. | Discuss the problems occurring due to shared data issue, by explaining the solutions. | CO5 | 14 |