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



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

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| **Code :** | **15EI2037** | **Duration :** | **3hrs** |
| **Sub. Name :** | **INTELLIGENT INSTRUMENTATION SYSTEMS** | **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 basic architecture of an embedded system with a neat diagram. | CO1 | 10 |
| b. | Write down the various steps involved for the conversion of assembly code into machine implementable code. | CO1 | 10 |
| **(OR)** | | | | |
| 2. |  | Discuss the features of various design process and metrics that is to be optimized in an embedded system design. | CO1 | 20 |
|  |  |  |  |  |
| 3. |  | Comment briefly on the hardware and software approaches for interfacing I/O devices with microcontroller. | CO1 | 20 |
| **(OR)** | | | | |
| 4. | a. | Design an embedded based data acquisition system to measure and display the body temperature from the patient. | CO2 | 10 |
| b. | Describe the operation of successive approximation type ADC. | CO2 | 10 |
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| 5. |  | It is desired to set up a completely automated automobile industry in which conveyors are used to transfer the parts from one station to the other. The stepper motors are used as the drivers in the conveyors. Enumerate the various methods involved in automatic control of a stepper motor using a microcontroller. | CO2 | 20 |
| **(OR)** | | | | |
| 6. | a. | Sketch the block diagram of data acquisition system and highlight the features of it. | CO2 | 14 |
| b. | Write short notes on simulation and emulation of an embedded system. | CO2 | 6 |
|  |  |  |  |  |
| 7. |  | Elaborate on the various RTOS task states with suitable examples. | CO3 | 20 |
| **(OR)** | | | | |
| 8. |  | Analyze the response of interrupt routines in RTOS environment and handling of interrupt source calls with necessary diagrams. | CO3 | 20 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the methodology to solve priority inversion problem using real time kernel. | CO3 | 15 |
| b. | List the various services of real time kernel. | CO3 | 5 |