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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14EC3078** | **Duration :** | **3hrs** |
| **Sub. Name :** | **Real Time and Embedded Control Automation** | **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 various design process and design metrics that is to be optimized in an embedded system design. | CO1 | 12 |
| b. | Write down the various steps involved for the conversion of assembly code into machine implementable code. | CO1 | 8 |
| (OR) | | | | |
| 2. | a. | Write an embedded C program to implement real time clock using microcontroller. | CO2 | 10 |
| b. | Draw the hardware connection between general purpose microcontroller and LED display and write an embedded C program for activating it. | CO2 | 10 |
| 3. | a. | Describe the generation of pulse width modulation signals in software and hardware. | CO2 | 14 |
|  | b. | Discuss the procedure for selection of ADC and design in an embedded system. | CO2 | 6 |
| (OR) | | | | |
| 4. | a. | Explain about the working principle of any one type of DAC. | CO2 | 10 |
|  | b. | Explain the various methods by which the stepper motor is interfaced to a microcontroller. | CO2 | 10 |
| 5. | a. | Discuss the finite state machine (FSM) and Write a pseudo code program to describe Timer operation and depict it by FSM. | CO2 | 12 |
|  | b. | With example, illustrate the Java based embedded system design. | CO1 | 8 |
| (OR) | | | | |
| 6. | a. | Write short notes on simulation of an embedded system. | CO1 | 8 |
|  | b. | What is host and target machine in an embedded system? | CO1 | 4 |
|  | c. | List out few high level languages for embedded system design and what are the advantages and disadvantages of high level languages for embedded system design. | CO1 | 8 |
| 7. |  | With neat sketch, illustrate the various methods of handling interrupt services by RTOS. | CO3 | 20 |
| (OR) | | | | |
| 8. | a. | Define process and task. Explain about different task states with an example. | CO1 | 10 |
|  | b. | Discuss how Priority Inversion problem is handled by Real time kernel in RTOS. | CO3 | 10 |
|  | | **Compulsory:** |  |  |
| 9. | a. | What are the RTOS System Level Functions and Task SeviceFunctions. | CO1 | 6 |
|  | b. | Describe the following  (i) Mailbox related functions available in UCOS-II.  (ii) Semaphore related functions available in UCOS-II. | CO1 | 14 |

ALL THE BEST