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 – April/May – 2017**

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| **Code :** | **14EC2029** | **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. | Write the constraints of Embedded systems. | CO1 | 3 |
| b. | Outline the characteristics of Embedded systems. | CO1 | 5 |
|  | c. | Explain briefly the different types of Embedded systems. | CO1 | 12 |
| (OR) | | | | |
| 2. | a. | Write any four applications of Embedded systems. | CO1 | 2 |
| b. | Relate how Embedded systems are different from General purpose systems. | CO1 | 3 |
|  | c. | Summarize in detail with neat diagrams the design life cycle of a general Embedded system. | CO3 | 15 |
| 3. | a. | Explain briefly the following:  1) Compiler 2) Assembler 3) Linker 4) Locator | CO2 | 8 |
|  | b. | Explain the Hardware and Software issues in designing an Embedded system. | CO2 | 12 |
| (OR) | | | | |
| 4. | a. | Develop an Embedded C program to Interface a 230V bulb with any microcontroller.Explain briefly with a neat block diagram and a flowchart. | CO3 | 10 |
|  | b. | Write short notes on the following:  i)Timer ii)Counter iii)Watchdog Timer iv) Issues in HW/SW co-design | CO3 | 10 |
| 5. | a. | Sketch the block diagram to Interface RTC with 8051. | CO3 | 5 |
|  | b. | Write the features of RTC DS12887 | CO3 | 5 |
|  | c. | Design an embedded system which displays hours,miutes and second.Draw a neat software flowchart for the same. | C03 | 10 |
| (OR) | | | | |
| 6. | a. | Give the block diagram to interface EEPROM with an Embedded controller. | CO3 | 5 |
|  | b. | Explain briefly with a neat block diagram and a flowchart how a DC motor can be interfaced with any microcontroller. Develop an Embedded C program for the same. | CO3 | 15 |
| 7. | a. | Analyze the hardware requirement for a Biometric sytem along with  the product Specification. | CO3 | 10 |
|  | b. | Explain briefly the process flow in a Traffic Light system using Timer and SCI communication. | CO3 | 5 |
| (OR) | | | | |
| 8. | a. | Write about Deadlock in semaphore. | CO2 | 4 |
|  | b. | Summarise the importance of Scheduler. | CO2 | 4 |
|  | b. | Explain briefly with a neat flow diagram, how semaphore is used between different concurrent tasks. | CO3 | 12 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Design an embedded system for an Automatic Coffee vending machine incorporating RTOS. Explain the different tasks in the system and give the hardware block diagram. | CO2 | 15 |
|  | b. | Write the different Task states with its flow diagrams. | CO3 | 5 |