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. |  | Explain with neat flow diagram the design life cycle of a Coin vending machine. | CO1 | 20 |
| (OR) | | | | |
| 2. | a. | Show with a neat diagram to how to interface 4 Led’s and 2 switches using 8051 Microcontroller? Write a C program to generate the following pattern when a switch is pressed:  1) Odd LEDs should only glow continuously with a delay  2) Even LEDs should only glow continuously with a delay | CO2 | 16 |
| b. | Compare timer and watch dog timer. | CO3 | 4 |
| 3. | a. | Explain with neat diagram the working of a DC motor interfaced with 8051 microcontroller. | CO1 | 12 |
|  | b. | Discuss the Hardware and Software issues in designing an Embedded system. | CO1 | 8 |
| (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 | 14 |
|  | b. | Sketch the block diagram to interface 8KB EEPROM with 8051 Microcontroller | CO3 | 6 |
| 5. | a. | Sketch the block diagram to Interface RTC with 8051. | CO1 | 5 |
|  | b. | Write the features of RTC DS12887 | CO1 | 5 |
|  | c. | Design an embedded system which displays hours,miutes and second.Draw a neat software flowchart for the same. | C02 | 10 |
| (OR) | | | | |
| 6. | a. | |  | | --- | | Find the count value of 8bit timer register of 8051 microcontroller to generate an interrupt of 10µs. Assume clock frequency to be 12 MHz. | | CO3 | 5 |
|  | b. | |  | | --- | | Define IDE. Summarize the different Software developmet tools necessary and briefly explain the same. | | CO2 | 15 |
| 7. | a. | |  | | --- | | Analyze the hardware requirement for a Biometric sytem along with  the product Specification. | | CO1 | 10 |
|  | b. | Explain the following :  a) SCI b) SPI | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Write about Deadlock in semaphore. | CO3 | 4 |
|  | b. | Summarise the importance of Scheduler. | CO3 | 4 |
|  | b. | Explain briefly with a neat flow diagram, how semaphore is used between different concurrent tasks. | CO2 | 12 |
|  | | **Compulsory:** |  |  |
| 9. | a. | What is shared data? Explain briefly with the help of any embedded application how shared data between different tasks causes error when semaphores are not used. | CO3 | 15 |
|  | b. | Write the different Task states with its flow diagrams. | CO3 | 5 |