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

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**End Semester Examination – Nov/Dec – 2018**

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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. | Compare between an Embedded system and a general purpose system. Use characteristics of an Embedded system to support the argument. | CO1 | 15 |
| b. | Compare Harvard and Von Neumann Architecture. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Illustrate the functional description about the different phases of Embedded Design Life Cycle Model. | CO3 | 15 |
| b. | Differentiate embedded system according to the performance and functional requirement. | CO1 | 5 |
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| 3. | a. | Explain briefly the following:  1) Compiler 2) Assembler 3) Linker 4) Locator | CO2 | 10 |
| b. | Discuss the Hardware and Software issues in designing an Embedded system. | CO3 | 10 |
| (OR) | | | | |
| 4. |  | Show with a neat diagram to how to interface 4 Led’sand 2 switches using 8051/AVR 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. | CO3 | 20 |
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| 5. |  | Design an interface diagram of a 12v bulb with a 8051 / AVR Microcontroller. Write the algorithm to make the bulb glow. | CO3 | 20 |
| (OR) | | | | |
| 6. |  | 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 | 20 |
|  |  |  |  |  |
| 7. | a. | Develop an algorithm to generate a time delay for 2 sec for displaying numbers from 0 to 9. | CO3 | 10 |
| b. | With a neat diagram explain the life cycle of task and task states | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Write about Deadlock in semaphore. | CO2 | 4 |
| b. | Summarise the importance of Scheduler. | CO2 | 4 |
| c. | Explain briefly with a neat flow diagram, how semaphore is used between different concurrent tasks. | CO3 | 12 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | Design an embedded system for an Automatic Washing machine Machine incorporating RTOS. Explain the different tasks in the system and give the hardware block diagram. | CO2 | 20 |