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



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

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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. | How embedded systems are different from conventional PC? | CO1 | 5 |
| b. | Elucidate the basic processors and hardware units in the embedded system. | CO1 | 10 |
| c. | Give some examples for small, medium and sophisticated scale embedded systems. | CO1 | 5 |
| **(OR)** | | | | |
| 2. | a. | Describe the architecture of a typical micro controller with a neat diagram. | CO1 | 10 |
| b. | Justify how suitable memory will be selected for the design of the embedded system. | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | What are the steps involved in the build process? | CO2 | 10 |
| b. | Classify embedded real time systems. Give an example for each. | CO2 | 10 |
| **(OR)** | | | | |
| 4. | a. | Describe any two software development model used in embedded system design with necessary diagrams. | CO2 | 14 |
| b. | With an example, differentiate between host machine and target machine. | CO2 | 6 |
|  |  |  |  |  |
| 5. | a. | Draw the dataflow graph for x=a+b if c=1 else x=a-b. | CO2 | 10 |
| b. | Discuss the function of In-Circuit emulator with diagram. | CO2 | 10 |
| **(OR)** | | | | |
| 6. | a. | Draw the dataflow graph for; | CO2 | 10 |
| b. | With a neat sketch, explain the following communication protocol.  (i) I2C (ii) SPI. | CO2 | 10 |
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| 7. | a. | List the need for watchdog timer in an embedded application. Explain how it protects the system with an example. | CO3 | 10 |
| b. | Identify and explain hardware units needed in automatic chocolate vending machine. | CO3 | 10 |
| **(OR)** | | | | |
| 8. | a. | With appropriate diagrams, explain multiple tasks and multiple processes in any one embedded based application. | CO3 | 15 |
| b. | Identify and explain hardware units needed in digital camera. | CO3 | 5 |
|  | | **Compulsory**: |  |  |
| 9. | a. | List any four commercial RTOS. | CO1 | 5 |
| b. | Assess the necessity of RTOS in an embedded system. | CO2 | 5 |
| c. | Design architectural hardware and software units needed in a smart card. | CO3 | 10 |