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

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

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| **Sub. Code :** | **14EC2027** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED MICROCONTROLLER** | **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 the block diagram of any microcontroller with a neat diagram. | CO1 | 12 |
| b. | Sketch the flowchart to interface an LED and make it blink with a delay using a microcontroller. | CO3 | 8 |
| **(OR)** | | | | |
| 2. | a. | Discuss the memory mapping in 68HC11 microcontroller . | CO1 | 10 |
| b. | Discuss the interrupt system of PIC32 microcontroller. | CO1 | 10 |
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| 3. | a. | Discuss the expanded mode of operation in 68HC11 Micocontroller. | CO1 | 10 |
| b. | Describe the traffic light control system using a microcontroller. | CO2 | 10 |
| **(OR)** | | | | |
| 4. | a. | Discuss the working of the internal timer of MC51 with a diagram. | CO2 | 10 |
| b. | Sketch the flowchart for implementing a software clock with seconds, minutes and hour. | CO2 | 10 |
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| 5. | a. | Develop an algorithm for generating a square wave with 50% duty cycle using any microcontroller. | CO3 | 10 |
| b. | Explain with a neat diagram the concept of serial communication and the interfacing of RS232 with MC68HC11 | CO3 | 10 |
| **(OR)** | | | | |
| 6. | a. | Compare and contrast the features of timer in PIC32 microcontroller and 68HC11 microcontroller. | CO1 | 10 |
| b. | Define interrupts and explain the process of a interrupt highlighting the difference in hardware and software interrupts. | CO2 | 10 |
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| 7. | a. | Apply the I/O operation of PIC 32 and control the motor used in robotics in forward, reverse and 45 degree step angle. Write the algorithm and explain its interfacing module. | CO2 | 12 |
| b. | Discuss ‘Output Compare’ in PIC32 microcontroller. | CO1 | 8 |
| **(OR)** | | | | |
| 8. | a. | Illustrate the importance of analog to digital converter in an embedded system. Also explain the 10bit internal ADC of PIC 32 microcontroller with a neat diagram. | CO2 | 12 |
| b. | Apply the JTAG concept to debug the system. | CO3 | 8 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Design a system to generate a delay of 500ms for an industrial application using the timer module of AVR Atmega microcontroller. Also explain the internal block diagram of timer module. | CO3 | 15 |
| b. | List some characteristics of AVR microcontroller. | CO1 | 5 |