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



**End Semester Examination – Nov/Dec – 2017**

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| **Code :** | **14EI3023** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED PROCESSORS FOR CONTROL AND AUTOMATION** | **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 use of open-drain output. | CO2 | 4 |
| b. | What are the uses of a power down-mode in an MCU? When does an MCU run in this mode? | CO3 | 6 |
| c. | Write short notes on the following Microcontroller resources:  i. Program Memory ii.Data memory iii.Parallel Ports iv.Serial Port | CO2 | 10 |
| (OR) | | | | |
| 2. | a. | What are the applications of the timer in an MCU? Why do the MCUs need at least one timer? | CO3 | 4 |
| b. | Give an example of the resources in the new generation MCUs. | CO1 | 6 |
| c. | Describe reset operation in an MCU. Reset circuitry in the MCU needs special design Why? | CO3 | 10 |
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| 3. | a. | What are the advantages of multiplexing of the data and the address buses at MCU? | CO2 | 4 |
| b. | Describe on-chip multi channel ADC applications and how the analog input maps with the converted bit. | CO1 | 10 |
| c. | Explain in detail how the RISC core improves the performance of a MCU. | CO2 | 6 |
| (OR) | | | | |
| 4. | a. | List the On-Chip features of 8051 microcontroller. | CO2 | 4 |
| b. | Write an assembly language program to add two numbers 2AH and F9H. Write the status of different flags after this addition. | CO1 | 6 |
| c. | Write an assembly language program using counter 0 in mode 1 to calculate the frequency of the input signal occurred at T0 terminal. Assume the crystal frequency is 12MHz. | CO1 | 10 |
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| 5. | a. | Write an assembly language program using 8051Microcontroller to transmit ‘WELCOME’ from Txd pin Continuously with the Baud rate of 4800. Assume the crystal frequency is 11.0592 MHz. | CO1 | 10 |
| b. | Draw and explain the circuit diagram to connect 64KB of external ROM and RAM memory chips to 8051microcontroller. | CO3 | 10 |
| (OR) | | | | |
| 6. | a. | Draw the interfacing diagram of relay with 8051 microcontroller & write an assembly language program to turn ON & OFF relay. | CO3 | 6 |
| b. | Mention the various types of addressing modes used in 8051 instructions. | CO2 | 6 |
| c. | Find the frequency and period used by the timer if the crystal connected to the 8051 has the following values.  i. 11.0592MHz ii. 20MHZ iii. 24MHz iv. 30MHz | CO1 | 8 |
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| 7. | a. | Assume Register R3 contains 0x8000. What would the register contain after executing the following Instructions?   1. STR R6, [R3, #12] 2. STRB R7, [R3], #4 3. LDRH R5, [R3], #8 4. LDR R12, [R3, #12]! | CO2 | 10 |
| b. | With an example explain the Baud Rate Calculation for configuring on-chip UART0 of ARM7 Microcontroller. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | What is the purpose of Fast Interrupt Request mode? | CO3 | 4 |
| b. | Explain the following with an example.   1. MOVS R6, R6, LSL #5 2. ADD R9, R8, R8, LSL #2 | CO1 | 8 |
| c. | Write an assembly language program to perform the following sequence  X = 1\*2 + 2\*3 + 3\*4 + …………… + (N-1) \* N | CO1 | 8 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Describe the important of programming model of ARM7 processor. | CO1 | 10 |
| b. | How many stages does the ARM7TDMI pipeline have? Explain. | CO2 | 10 |

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