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 – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **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. | List the benefits of EEPROM and Flash. | CO2 | 4 |
| b. | Write short notes on the following Microcontroller resources:  i) Timer/Counter ii)PWM | CO1 | 6 |
| c. | Give an application of a Microcontroller in an automatic process control. | CO3 | 10 |
| (OR) | | | | |
| 2. | a. | How does a Microcontroller differ from Microprocessor? | CO2 | 4 |
| b. | Explain in detail how the RISC core improves the performance of a MCU. | CO2 | 6 |
| c. | What are the features of Harvard and Princeton architectures? | CO2 | 5 |
| d. | Discuss various factors involved in selecting a microcontrollers. | CO3 | 5 |
| 3. | a. | What are the different ways of classifying the Microcontrollers? | CO1 | 6 |
| b. | Write short notes on interrupt in MCU. | CO1 | 8 |
| c. | Explain how to use a data direction register with a parallel port. | CO1 | 6 |
| (OR) | | | | |
| 4. | a. | Draw the PSW format of 8051 microcontroller & state various conditions of flags. | CO2 | 4 |
| b. | Describe the instructions SWAP A and MOVX @DPTR, A with one example. | CO1 | 6 |
| c. | Describe the function of PSEN, EA, XTAL1, XTAL2, ALE and RESET pins of 8051microcontroller. | CO3 | 10 |
| 5. | a. | Write an assembly language program to generate 2KHz square wave on pin P1.0 of port 1 of 8051microcontroller. (Use Interrupt) | CO3 | 8 |
| b. | Draw the format of SCON Register and describe the function of each bit. | CO3 | 4 |
| c. | Write an assembly language program to toggle all the bits of PORT1 every 200ms. Assume that the crystal frequency is 11.0592MHz, and the system is using AT89C51. | CO1 | 8 |
| (OR) | | | | |
| 6. | a. | Write an assembly language program using 8051Microcontroller to transmit ‘TEST’ from Txd pin Continuously with the Baud rate of 9600. Assume the crystal frequency is 11.0592 MHz. | CO1 | 10 |
| b. | Describe the interrupts used in 8051. Give their priority & addresses. | CO2 | 10 |
| 7. | a. | Assume an Array contains 30 Words of Data. A compiler associates variables x and y with register R0 and R1 respectively. Assume the starting address of the array is contained in R2. Translate the C statement below into assembly instructions:  x = array[7] + y; | CO2 | 5 |
| b. | With an example explain the function of Pin Connect Block in ARM7 Microcontroller. | CO3 | 5 |
| c. | With the neat sketch explain the architecture of ARM7TDMI processor core. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Translate the following conditions into a single ARM instruction:   1. Add Registers R3 and R6 only if N is clear. Store the result in Register R7.(Assume R3 and R6 contains signed numbers) 2. Multiply Registers R7 and R12, putting the result in Register r3 only if C is Set and Z is clear. 3. Compare Registers R6 and R8 only if Z is clear. | CO3 | 6 |
| b. | Write an assembly language program to convert the following C code,  while(a != b)  {  if(a>b)  a=a-b;  else  b=b-a;  } | CO3 | 8 |
| c. | What is the function of PINSEL Register in ARM processor? Give an example to enable GPIO3.7 to GPIO3.0 for Input function. | CO3 | 6 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Give a brief note on the operating modes of ARM processor. | CO1 | 10 |
| b. | Describe the important of programming model of ARM7 processor. | CO2 | 10 |

ALL THE BEST