**PBD-003-1275004** Seat No. _____

# M. Sc. (ECI) (Sem. V) (CBCS) Examination

## November / December - 2018

## Microprocessor And Microcontroller : Paper - 20

### Faculty Code : 003
### Subject Code : 1275004

Time : $2\frac{1}{2}$ Hours]　　　　　　　　　　　　[Total Marks : **70**

**1** Answer the following : (Any **Seven** out of Ten)　　　**14**

(1) 48H in BCD, when converted to ASCII is _____ H and _____ H.

(2) ATmega32 has _____ pins. And It has _____ GPRs.

(3) ADC848 is an example of _____ ADC, while the MAX1112 is an example of a _____ ADC. (serial/ parallel)

(4) Name the different groups of an AVR chip.

(5) List the 8085 interrupts.

(6) Find the checksum byte for the values 21H, 1AH, 30H and 44H.

(7) Show the Hex number value used by the following directives.
(1) .EQU ASC_DATA = '7'
(2) .EQU MY_DATA = 0b11011011

(8) Explain LM34 & LM35 series temperature sensors.

(9) Write the assembly language code for AVR to move values 0×25 and 0x15 into registers R18 & R19 respectively.

(10) State TRUE or FALSE
(1) In ATmega32, Timer0 and Timer1 are 8-bit, while Timer2 is 16-bit.
(2) Reed switches are also widely used in dirty and dusty atmospheres because they are tightly sealed.

**2**   Answer the following : (Any **Two** out of three)          **14**

   (1)   Show the simple assembly language codes for the following.

   (A)   LOAD THE ACCUMULATOR WITH DATA 4FH.

   (B)   LOAD THE ACCUMULATOR WITH THE CONTENT OF MEMORY LOCATION 4045H

   (C)   ADD THE DATA 32H WITH ACCUMULATOR.

   (D)   COPY THE CONTENT OF REGISTER C INTO REGISTER B

   (E)   CREATE A MEMORY POINTER AT LOCATION 8000H.

   (F)   ACCUMULATOR HAS DATA FFH. MAKE IT OOH WITH ONE BYTE INSTRUCTION.

   (G)   STORE THE CONTENTS OF REGISTERS B & C ON THE STACK.

   (2)   Draw the architecture of 8085.

   (3)   Upon activation of an interrupt, What are the steps that microcontroller / microprocessor goes through ?


**3**   Answer the following :          **14**

   (1)   What is MAX 232? Explain it with its connection to ATmega32.

   (2)   Write an AVR C program to toggle all bits of PORT A continuously.

   (A)   USE THE INVERTING OPERATOR

   (B)   USE THE EX-OR OPERATOR

**OR**

   (1)   Write an AVR C program to convert ASCII digit "7" and "5" to packed BCD and display them on PORT A.

   (2)   Write an AVR C program to read PORT C and display the data on PORT A and on PORT B.

4    Answer the following :                                                    **14**

   (1)  Find the content of PORTs after the execution of each
        of the following codes.

        (1)  *PORT B = 0 × AA & 0 × 99;*
        (2)  *PORT B = ~ 0 × F0 ^ 0 × F0;*
        (3)  *PORT C = 0 × 55 | 0 × AA;*
        (4)  *PORT A = 0 × 3A ^ 0 × B5;*
        (5)  *PORT A = 0 × AA >> 3;*
        (6)  *PORT B = 0 × FF << 2;*
        (7)  *PORT D = 0 × 22 ^ ~ 0 × 44;*

   (2)  Explain the following hex file lines and verify the
        checksum byte for line 2.

        : 02 0000 02 0000 *FC*
        : 0C 0000 00 01021020000000000000101010 8*D*
        : 00 0010 01 *FF*

5    Answer the following : (Any Two out of Four)                              **14**

   (1)  Draw & explain the data memory space of AVR
        (without extended memory).

   (2)  Assume that to generate a square wave of 16kHZ.
        XTAL = 8MHZ. Find the value of TCNTO.

   (3)  Explain the following instruction for AVR.

        (1)  LDI
        (2)  ADD
        (3)  LDS
        (4)  STS
        (5)  IN
        (6)  OUT

   (4)  Write the characteristics of the ADC peripheral for the
        ATmega32.

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