Code: AE66/AC66/AT66/ AE108/AC108/AT108
Subject: MICROPROCESSORS & MICROCONTROLLERS

AMIETE – ET/CS/IT (Current & New Scheme)

Time: 3 Hours   **December 2016**   Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1   Choose the correct or the best alternative in the following: (2×10)

a. Nibble is a group of
   (A) 8-bits   **(B)** 16-bits
   (C) 4-bits   **(D)** 1-bit

b. Specify the addressing mode of the instruction LDA 2000H
   (A) Immediate   **(B)** Direct
   (C) Register indirect   **(D)** Register

c. Number of T-states required to execute the instruction LHLD (16-bit address)
   (A) 16   **(B)** 10
   (C) 7   **(D)** 18

d. $IO/\overline{M}$ Pin is used for
   (A) Memory mapped I/O and I/O mapped I/O
   (B) To inform status of memory
   (C) To inform status of I/O
   (D) Interrupt

e. Number of flags in the status register of 8085 are
   (A) 4   **(B)** 6
   (C) 8   **(D)** 5

f. DAD H instruction is used for
   (A) 16-bit addition   **(B)** 8-bit addition
   (C) Decrement operation   **(D)** Increment operation

g. $\overline{EA}$ Pin of microcontroller 8051 is used to
   (A) Enable External memory address
   (B) Indicate Internal memory address
   (C) Address status pin
   (D) Address latch enable

h. $CAS_2 - CAS_o$ pins of 8259 are used for
   (A) Chip select   **(B)** Program enable buffer
   (C) Cascading of two 8259   **(D)** Command select lines

   i. Interfacing device for Direct Memory access operation is
     (A) 8255   **(B)** 8259
     (C) 8279   **(D)** 8257

   j. Identify the content of register B after the execution of the following program
     MVI A, 12H
     ANI EDH
     MOV B, A
     (A) EDH   **(B)** 00H
     (C) FFH   **(D)** 12H

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. Draw the functional block diagram of 8051 microcontroller.   **(8)**

       b. Write a program to compliment 8 bit number stored in register r1 and put the result in register r2 using 8051 instructions.   **(8)**

Q.3 a. Write an assembly language program to add 16 bit number using 8085 instructions (assume numbers are stored in memory).   **(8)**

       b. Explain the function of following pins of 8257 DMA controller   **(8)**

         (i) $\overline{\text{IOW}}$ (ii) HRQ
         (iii) HLDA   (iv) AEH

Q.4 a. Draw and explain architecture of 8085.   **(8)**

       b. Write a program to arrange series of numbers in ascending order using 8085 instructions.   **(8)**

Q.5 a. Draw and explain interfacing of matrix keyboard with the microprocessor 8085.   **(8)**

       b. Draw and explain block diagram of interrupt controller 8259.   **(8)**

Q.6 a. Draw and explain bits of 8254 control word register.   **(8)**

       b. Explain the function of the following pins of 8251 USART   **(8)**
         (i) TXD   (ii) TXRDY
         (iii) $\overline{\text{TXC}}$ (iv) TXE

Q.7 a. Explain the instruction format of SIM and RIM instruction of 8085.   **(8)**

       b. Explain various operating modes of 8255.   **(8)**

Q.8 a. Draw the interfacing of 7-segment display with 8085 microprocessor.   **(8)**

       b. Distinguish between following pair of Instructions: **(8)**
        (i) SHLD F200H and LHLD F200H
        (ii) LXI B, 2122H and LHLD 2122H
        (iii) MVI M, 2DH, and LXI B, 002DH
        (iv) LDAX H, and MOV A, M

Q.9 a. What do you mean by addressing mode? Explain the different types of addressing modes available in 8085, with an example for each.   **(8)**

       b. List the instructions from logical group and give example of each one for 8085 microprocessor.   **(8)**