ROLL NO. _____

Code: AE66/AC66/AT66 Subject: MICROPROCESSORS & MICROCONTROLLERS

AMIETE – ET/CS/IT (NEW SCHEME)

Time: 3 Hours **DECEMBER 2011** **Max. Marks: 100**

NOTE: There are 9 Questions in all.

- **Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.**
- **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. The internal clock frequency and the fabrication technology of 8085A microprocessor is

(A) 5 MHz and HMOS **(B)** 5 MHz and NMOS
(C) 3 MHz and NMOS **(D)** 3 MHz and HMOS

b. XTHL instruction exchanges the contents of

(A) DE with HL
(B) Top two contents of stack locations with contents of HL
(C) Bottom two contents of stack locations with contents of HL
(D) Program counter contents with contents of HL

c. RST 7.5 is _____ triggered interrupt.

(A) Edge **(B)** Level
(C) Both **(A)** and **(B)** **(D)** None of the above.

d. The port used to configure 8255 in bidirectional I/O is

(A) Port-0 **(B)** Port-A
(C) Port-B **(D)** Port-C

e. The program counter (PC) in a microprocessor

(A) Counts the number of programs being executed on the microprocessor
(B) Counts the number of instructions being executed on the microprocessor
(C) Counts the number of stack instructions being executed on the microprocessor
(D) keeps the address of the next instruction to be fetch

f. When a microprocessor system is undertaking data transfer under DMA scheme, its CPU will

(A) carry out usual data processing
(B) route data to the desired memory location pointed out by the program counter
(C) route data to the desired I/O device
(D) remain idle and do nothing

g. Which of the data transfer is not possible in a microprocessor?

(A) memory to accumulator **(B)** accumulator to memory
(C) memory to memory **(D)** I/O Device to accumulator

h. The data bus in a microprocessor based system is used for data transfer

(A) between the microprocessor and I/O device
(B) between the microprocessor and memory
(C) between the I/O device and microprocessor
(D) all of the above

i. Programmable interval timer 8253 has a maximum count rate of

(A) 1 MHz **(B)** 10 MHz
(C) 2 MHz **(D)** 4 MHz

j. Which of the following SFRs of 8051 are one bit addressable?

(A) PSW **(B)** Accumulator
(C) Timer counter (TCON) **(D)** All of the above

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

Q.2 a. What are the needs of addressing modes? Explain different types of 8085 addressing modes. **(8)**

b. With an example explain the working of the following instructions:

(i) MOV R, M (ii) XCHG
(iii) LDAX R_P (iv) DAD R_P **(8)**

Q.3 a. Compare memory mapped I/O with I/O mapped I/O. **(6)**

b. Mention the steps involved in an instruction cycle and explain the steps with an example **(10)**

Q.4 a. Write an 8085 ALP to search a given byte in an array of bytes using linear search algorithm by considering location X for size of an array, X+1 for elements to be searched and from Y onwards for the elements. **(8)**

b. Write an 8085 ALP to convert an 8-bit binary number stored in memory location X to equivalent BCD number. **(8)**

Q.5 a. What is the purpose of SIM instruction? With the format explain SIM instruction. **(8)**

b. Discuss the action taken by 8085 when INTR pin is activated. **(8)**

Q.6 a. Write an 8085 ALP to implement a decimal up counter using logic controller interface. **(8)**

b. Write a circuit diagram to interface a simple keyboard using tristate buffers. What are the drawbacks of this method? **(8)**

Q.7 a. Briefly describe the functions of 8259 pins. **(8)**

b. What is the need for DMA data transfer? Provide an overview of the working of 8257 DMA controller. **(8)**

Q.8 a. Configure control port of 8253 in mode3 to count decimal numbers in counter1 and explain with neat waveforms mode3 operation of 8253. **(8)**

b. Describe synchronous data transmission and asynchronous data reception of 8251. **(8)**

Q.9 a. Discuss the important features of 8051 microcontroller. **(6)**

b. Write 8051 ALP to convert 4-digit hexadecimal number to equivalent ASCII number. **(6)**

c. Explain the various bits available in PSW register. **(4)**