ROLL NO. _____

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

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

Time: 3 Hours **JUNE 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. The register used as working area of microprocessor is known as
(A) Program counter **(B)** Instruction Register
(C) Instruction decoder **(D)** Accumulator

b. The group of wires that connects various sections of microprocessor is called
(A) cables **(B)** wire
(C) Bus **(D)** Route

c. The data width of the 8085 microprocessor is
(A) 4 bit **(B)** 8 bit
(C) 12 bit **(D)** 16 bit

d. The program counter holds
(A) Op code **(B)** Data address
(C) Operand address **(D)** Instruction address

e. The external clock connected to the 8085 microprocessor has the frequency
(A) 1 MHz **(B)** 2 MHz
(C) 3 MHz **(D)** 6 MHz

f. The priority of TRAP is
(A) Highest **(B)** Lowest
(C) Neither highest nor lowest **(D)** none

g. The control word of 8255 to make port –A as output and rest of ports as input ports is
(A) 8 B **(B)** 7 B
(C) 8 A **(D)** 7 A

h. The _____ directive is always used for ASCII strings
(A) DB **(B)** ORG
(C) EQU **(D)** END

i. A microprocessor with 10 address lines will be able to address_____ of memory
(A) 1 kB **(B)** 4 kB
(C) 0.5 kB **(D)** 8 kB

j. SJMP is a _____ instruction
(A) One Byte **(B)** Two Byte
(C) Three Byte **(D)** None

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

Q.2 a. Explain the register organization of 8085. **(8)**

b. Add the numbers (–4) and (+2) as performed by a computer assuming:- **(4)**
(i) 4-bit signed magnitude notation
(ii) 4-bit 2's complement notation

c. Explain the following instructions taking suitable examples:- **(4)**
(i) STA (ii) LXI
(iii) LDAX (iv) SHLD

Q.3 a. Explain the following: **(8)**
(i) Instruction cycle (ii) Machine cycle
(iii) Clock cycle (iv) Op-code fetch

b. How does the 8085 performs subtraction? Explain with suitable examples. **(4)**

c. Explain the advantages of multiplexed address and data buses. **(4)**

Q.4 a. Write the 8085 assembly language program to convert BCD to binary number. The MSD and LSD numbers are stored at locations 2040 H and 2041 H respectively. Display result at 2042 H. **(8)**

b. Write an assembly language program to multiply by 08H a number stored at location 2130 H and store the result at location 2131H. **(8)**

Q.5 a. Name the various data transfer schemes. Explain briefly the memory mapped input-output data transfer with suitable diagram. **(8)**

b. Describe different modes of 8255. **(8)**

Q.6 a. Explain the internal architecture of 8279 keyboard and display controller. **(8)**

b. Write an 8085 program to implement a decimal counter using logic controller interface. The starting count should be through the interface and the count should be displayed on the interface. **(8)**

Q.7 a. What is need of 8259 interrupt controller? Draw and explain the internal architecture of 8259. **(8)**

b. What is DMA? Explain block diagram of 8257 DMA controller. **(8)**

Q.8 a. What are various modes of 8253? Explain which mode generates square wave and how? **(8)**

b. Explain the functional block diagram of USART. **(8)**

Q.9 a. Compare the microcontroller with microprocessor. Draw and explain the functional block diagram of 8051 microcontroller. **(10)**

b. Explain various addressing modes of 8051. **(6)**