ROLL NO. _____

Code: DE60/DC68 Subject: MICROPROCESSORS & MICROCONTROLLERS

DipIETE – ET/CS (Current Scheme)

Time: 3 Hours **JUNE 2015** **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: (2x10)

a. The circuits in 8085A that performs logic and arithmetic functions are called
(A) CPU **(B)** ALU
(C) Data bus **(D)** Memory bus

b. Which of the following statement is incorrect with respect to TRAP interrupt
(A) It has highest priority **(B)** It is mask-able interrupt
(C) It is edge and level triggered interrupt **(D)** It is used for emergency purposes.

c. Which of the following statement is TRUE for instruction MVI M, Data
(A) Affects carry flag.
(B) Immediate addressing mode instruction
(C) Memory contents remain unaffected.
(D) It is a 3 byte instruction.

d. _____pin of 8251 is a general purpose one bit inverting output port that is used to send MODEM control condition
(A) TxRDY **(B)** $\overline{RD}$
(C) $\overline{CS}$ **(D)** $\overline{DTR}$

e. Which of the following is not a register of PIC 8259?
(A)IMR **(B)** SR
(C) PR **(D)** IRR

f. 8051 has three general purpose flags that are user programmable .Out of these one is saved in PSW & other two are saved in

(A) ALU **(B)** Stack pointer
(C) PCON register **(D)** DPTR

g. The number of software interrupts in 8085 is ____

(A) 4 **(B)** 8
(C) 6 **(D)**10

h. ISA bus stands for _____

(A) Industry standard Architecture **(B)** Indian Standard Architecture
(C) Interrupt Sequence Address **(D)** Interrupt Serial Address

i. In 8255 the port that is used for the generation of handshake line in MODE 1 or MODE 2 is ___

(A) Port A **(B)** Port C- Upper
(C) Port B **(D)** Port C-Lower

j. The pin that disables all the DMA channels by clearing the mode registers is

(A) MARK **(B)** RESET
(C) READY **(D)** CLEAR

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

Q2. a. Draw block diagram schematic of 8085 bus structure .Explain buses/ communication lines used by 8085. **(6)**

b. How many categories of instructions exist in 8085instruction set (as per operations performed)? Discuss each category with example. **(10)**

Q3. a. Specify purpose of the following pair of instructions of 8085 and category to which they belong.

(i) CZ and CNZ (ii) SPHL and PCHL
(iii)XRA and XRI (iv) RAL and RLC **(8)**

b. Describe the structure of flag register in 8085 stating purpose of each flag. **(8)**

Q4. a. Write an assembly language program to subtract two eight bit numbers stored in memory locations D000 H and D001 H .The result is stored in D002H. **(8)**

b. Mention task performed and addressing mode for each of the following instructions:
(i) ADD R (ii) DCR R (iii)JM 16 bit (iv) ADI 8 bit (v) JMP address
(vi) OUT 8 bit port address (vii) MVI R, 8 bit (viii)NOP **(8)**

Q5 **a.** What do you mean by non-mask able interrupt? Discuss format of SIM and RIM instruction in 8085 . **(8)**

b. List the main features of PPI 8255.What will be the control word format to initialize 8255 in following mode:

PORT A-Mode 0-input ;PORT B –mode 0 Output ; PORT C upper –Mode 0 output and PORT C lower- Mode 0 input **(8)**

Q6. **a.** Draw functional pin diagram of Intel 8279-keyboard and display controller and discuss functions for the following pins-
(i) Reset (ii) Shift (iii) Ctrl/Stb (iv) IRQ **(8)**

b. Draw functional block diagram of 8259 programmable interrupt controller. List out the function of each block. **. (8)**

Q7. **a.** What is the need for DMA controller? List features of DMA controller 8257 . Also specify functions of following pins of Intel 8257 DMA Controller.
(i) ADSTB (ii) $\overline{IOW}$ (iii)HRQ (iv) HLDA **(8)**

b. What is the need for 8253 interval timer in micro computer system? State functionality of following pins of 8253
$\overline{CS}$ (ii) CLK (iii) GATE (iv) $\overline{RD}$ (v) $\overline{WR}$ (vi) OUT **(8)**

Q8. **a.** Discuss in brief what information is indicated on Intel 8251 USART control port to configure it for transmission / reception in asynchronous mode? **(8)**

b. Write an assembly language program for multiplication of two 8 bit numbers X and Y using repetitive addition **(8)**

Q9. **a.** Compare & contrast microcontrollers and microprocessors. List features of 8051 microcontroller. **(8)**

b. Describe (with suitable examples) all the addressing modes available in 8051 **(8)**