

DiplETE - ET/CS

Time: 3 Hours

JUNE 2013

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. Which of the following is not an advantage of an assembly language program

- (A) Less error prone
- (B) No need of compiler
- (C) Less tiresome to work with
- (D) Same program works on any computer

b. Which of the following addressing mode is not provided in 8085.

- (A) Register addressing mode
- (B) Indirect addressing mode
- (C) Indexed addressing mode
- (D) Direct addressing mode

c. TRAP is a

- (A) Only level sensitive interrupt
- (B) Non-maskable interrupt
- (C) maskable interrupt
- (D) Software interrupt

d. _____ pin of 8251 is a general purpose one bit inverting output port that is used to send MODEM control condition

- (A) $\overline{\text{TxRDY}}$
- (B) $\overline{\text{RD}}$
- (C) $\overline{\text{CS}}$
- (D) $\overline{\text{DTR}}$

e. Intel 8085A is fabricated using _____ technology.

- (A) NMOS
- (B) PMOS
- (C) HMOS
- (D) CMOS

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- f. Which of the following statements is true for NOP instruction in 8085 microprocessor
- (A) This instruction is not used in the program as it does nothing
 - (B) It halts program execution
 - (C) Address and data bus are placed in high impedance state
 - (D) Its one byte instruction
- g. 8257 DMA controller is in master mode when _____
- (A) Processor is reading data from 8257
 - (B) Processor is programming 8257
 - (C) Processor is in active mode
 - (D) Processor is in HOLD state
- h. Intel 8255 chip is to be interfaced for sending data to LED display that updates display based on latched output. Which mode of operation for 8255 is most suitable for this operation?
- (A) Mode 0
 - (B) Mode 1
 - (C) Mode 2
 - (D) None of these
- i. _____ is an 8-bit register of 8259 interrupt controller that keeps track of active interrupt requests.
- (A) Interrupt mask register
 - (B) Interrupt request register
 - (C) Interrupt service register
 - (D) Slave register
- j. Maximum external RAM addressability in 8051 is _____
- (A) 1KB
 - (B) 1MB
 - (C) 64K
 - (D) 128 byte

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

- Q.2** a. Distinguish between following pair of instructions of 8085 (8)
- (i) LXI H, 123H and LHLD 1234H
 - (ii) SPHL and PCHL
 - (iii) XRA M and ORA M
 - (iv) RRC and RLC
- b. What is PSW? Write a 8085 assembly program to exchange contents of accumulator and flag register. (8)

- Q.3** a. Describe the working of the instructions CALL and RET. (8)
- b. Discuss the merits and demerits of I/O-mapped and memory-mapped I/O. (8)
- Q.4** a. Write an assembly language program to perform block movement without overlap of a block starting at location X to the block starting at location Y. (8)
- b. Write an assembly language program to find the smallest of N byte binary numbers. N value is stored at location X and numbers start from location X+1. Display the smallest number in the data field and its location in the address field. (8)
- Q.5** a. In how many ways a microprocessor can communicate with an I/O port for parallel data transfer with programmed I/O? Discuss each with proper flowchart. (8)
- b. Explain functions of different interrupt pins available in 8085. (8)
- Q.6** a. Explain mode definition control word of 8255. Write the required mode control definition word for each of the following:
- (i) Port A: mode 0 input; Port B: mode 0 output; Port C-upper: input; Port C lower: output
- (ii) Port A: mode 1 input; Port B: mode 0 input; Port C upper: output; Port C lower: input (8)
- b. Write an 8085 assembly program to evaluate two 4-variable Boolean expressions
- $$X = PQRS + \overline{PQR}\overline{S} + \overline{P}\overline{S}$$
- $$Y = \overline{PQ}\overline{R}\overline{S} + \overline{PRS}$$
- using logic controller interface. (8)
- Q.7** a. What is the need for interrupt controller in microcomputer system? Draw a neat functional pin diagram of Intel 8259 and state function of various pins. (8)
- b. What is the need for DMA data transfer in microcomputer system? State the function of following pins of DMA controller 8257
- | | |
|-----------|-----------------------|
| (i) Ready | (ii) HLDA |
| (iii) HRQ | (iv) \overline{IOW} |
| (v) TC | (vi) \overline{MR} |
- (8)
- Q.8** a. Discuss the need of a programmable interval timer in microcomputer system. In how many modes of operation a counter can be configured to work? (4)
- b. Briefly explain mode 2 operation of 8253 (4)

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- c. Discuss in brief what information is indicated on Intel 8251 USART control port to configure it for transmission / reception in asynchronous mode? (8)
- Q.9** a. What is a microcontroller? What are its applications? (4)
- b. Explain the function and byte usage for following instructions in IC8051 (4)
- (i) MUL A B (ii) CLR C
(iii) SWAP A (iv) XCH A, 31H
- c. Describe (with suitable examples) all the addressing modes available in 8051. (8)