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53 (IE 501) MPMC

2013

(May)

**MICROPROCESSOR AND
MICROCONTROLLERS**

Paper : IE 501

Full Marks : 100

Pass Marks : 30

Time : Three hours

***The figures in the margin indicate full marks
for the questions.***

Answer any five questions.

1. (a) What is the function of the accumulator? 1
- (b) What is a flag? 1
- (c) Specify the four control signals commonly used by the 8085 microprocessor. 1

Contd.

- (d) How many address lines are necessary to address two kilobytes (2K) of memory ? 1
- (e) If the chip memory size is 256×1 bits, how many chips are required to make up 1K (1024) bytes of memory ? 1
- (f) What is the function of Program Counter and Stack Pointer ? 2
- (g) Explain the function of the following signals : 3
- (i) ALE
 - (ii) $\text{IO}/\overline{\text{M}}$
 - (iii) INTR
- (h) Specify the operations performed by the following instructions : 10
- LXI, STA, CALL, RAR, JNZ, XRA, CMP, INX, RET, ADI.
2. (a) If the clock frequency is 5MHz, how much time is required to execute an instruction of 18T-states. 3
- (b) What is a tri-state buffer ? Why it is used in memory devices ? 2

- (c) How the following flags are affected? 3
(i) Zero Flag
(ii) Auxillary Flag
(iii) Carry Flag.
- (d) List the sequence of events that occurs when the 8085 Microprocessor reads instructions or data from memory. 4
- (e) Design a circuit for interfacing the following chip with 8085 microprocessor. 8
(i) A 4K Byte ROM
(ii) A 2K Byte RAM
Also determine the address range for each chip.
3. (a) Draw the timing diagrams for the following instructions : 4+6=10
(i) MVI
(ii) OUT
- (b) Write a delay program using one register. 2
- (c) What do you mean by Subroutine? 1
- (d) What is stack? How the contents of a register pair is stored in stack and retrieved from stack? Explain with the help of a program. 5

- (e) How demultiplexing of lower order address bus is done? 2
4. (a) Draw the block diagram of 8255 programmable peripheral interface. Explain the operation of *each* block. 10
- (b) Specify the bits of a control word for the 8255 in I/O mode and in BSR mode. 5
- (c) Write a program to transfer *five* blocks of data from one memory location to another memory location. 5
5. (a) What do you mean by vectored and non-vectored 8085 interrupts? 2
- (b) List the vectored and non-vectored interrupts used in 8085 microprocessor. 2
- (c) Among all the interrupts, which is having the highest priority? 1
- (d) Specify the bits of SIM instructions. 2
- (e) Draw the block diagram of 8155 multipurpose programmable device. Discuss the control signals, I/O ports, control register and control word used in 8155 device. 10

- (f) What do you mean by handshake signals ?
What are the handshake signals used by 8255 device in input configuration. 3
6. (a) Name the major components of the 8279 keyboard / Display interface and explain each of them. 8
- (b) What are the different modes of operation of 8254 programmable interval timer ? Explain three modes. 8
- (c) Write a program to 4
- (i) Clear the accumulator
 - (ii) Add two number 47H and 22H
 - (iii) Mark the higher order bits from the result of addition.
 - (iv) Display the final result in location Co50.
7. (a) Draw the complete architecture of 8085 microprocessor and explain the function of each and every constituent blocks. 15
- (b) Write a program to find the largest of two numbers. 5