This question paper contains 5 printed pages.

8492 *Your Roll No.* .....

B.Tech. (E) / IV **A**

PAPER EEE–404— MICROPROCESSOR APPLICATIONS

Time : 3 hours *Maximum Marks* : 70

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt five questions in all, including Question No. 1 which is compulsory.

All questions carry equal marks.

1. State *True* or *False* and justify:

(*i*) The number of programmable 8-bit registers of 8085 which can also be used as 16-bit register pair are eight.

(*ii*) Except carry flag none of the flags are affected due to data transfer instructions of 8085.

(*iii*) All flags are affected by execution of the single byte addition/subtraction instructions.

(*iv*) For the instructions RLC, RRC, RAL, RAR the addressing mode used is immediate.

(*v*) ALE remains high during the entire period of T1 of every machine cycle.

P. T. O.

(vi) Number of pins corresponding to ports A, B of 8255 is 8, 6.

(vii) When A_1 and A_0 are 0, the register of 8254 which is selected is Control Register. 7×2=14

2. Answer any two:

(a) Explain the programming model of 8085 microprocessor including hardware model, registers and flags in detail. 7

(b) Draw and explain the timing diagram for executing instruction MVI B, 52H. Explain both Opcode Fetch and Memory Read cycles. Also enlist the necessary steps required for a microprocessor to communicate with a memory. 7

(c) Design an interfacing circuit to connect microprocessor and memory as per following specifications:

(i) 74LS138 (3 to 8) decoder without additional gates.

(ii) 2732 (4K×8) EPROM-address range should start at 0000H and additional 4K memory space should be available for future expansion.

(iii) 6116 (2K×8) CMOS R/W memory. What is the foldback address range? 7

3. (*a*) Write a program to add the following five data bytes stored in memory locations starting from XX60H and display the sum. Use the register pair DE as a memory pointer to transfer a byte from memory into a register. No carry is generated.

Data (H) : 1A, 32, 4F, 12, 27 . 7

(*b*) Explain the different types of addressing modes, with a suitable example, used in data transfer instructions. Also write a program to load the number 50H in register and display it at an output port labelled PORT1. 7

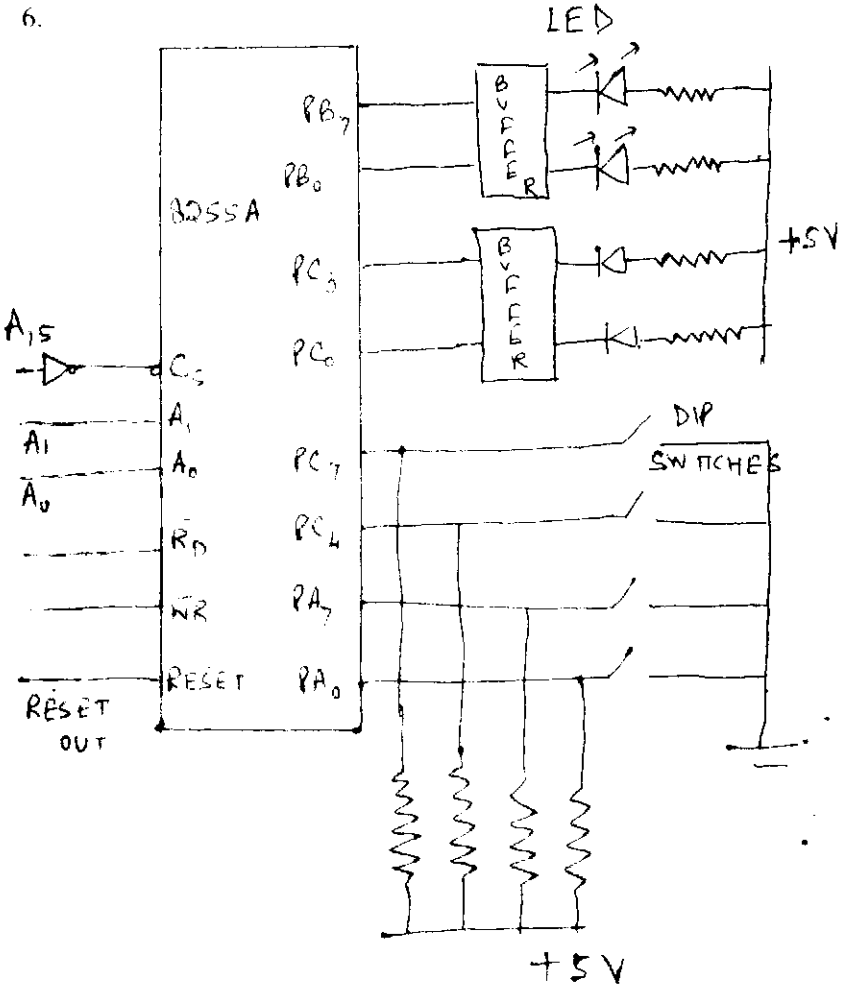
4. (*a*) Design an up-down counter to count from 0 to 9 and 9 to 0 continuously with a 1 second delay between each count and display the count at one of the o/p ports. Draw the flowchart and calculate the delay if microprocessor frequency is 2 MHz. 7

(*b*) Explain the concept of Stack, Stack Pointer and PSW in detail. 7

5. (*a*) Explain with the help of a neat diagram how an AD 7522 D/A converter be interfaced with 8085. Also write a small program to load the maximum input of ten bits (all 1's) into the D/A converter. 7

(*b*) Explain the data transmission format, modes of data transfer and microprocessor controlled data transfer under various conditions. 7

6.



Refer the figure above:

(*i*) Identify the Port address in the figure.

(*ii*) Identify the mode 0 control word to configure Port B and Port C_L as output ports and port A and port C_U as input ports.

(*iii*) Write a program to read the DIP switches and display the reading from port A at port B and from port C_U at port C_L alongwith a flowchart and explain. 14

7. (*a*) Draw the block diagram of 8259A Programmable Interrupt Controller and explain the function of each block. Also explain the interrupt operation in brief. 7

(*b*) Explain the six different modes of operation of 8254 Programmable Interval Timer. 7

8. Write short notes on any *three*:

(*i*) 8085 Vectored Interrupts

(*ii*) D.M.A.

(*iii*) Successive Approximation A/D Converter

(*iv*) Block diagram of 8279 KBD interface

(*v*) BSR mode of 8255 PPI. 5+5+4