Total number of printed pages = 8

19/4th Sem/DIE 403

2022

MICROPROCESSOR

Full Marks – 100

Time – Three hours

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

Answer any *five* questions.

1. (a) Why is 8085 called an 8-bit microprocessor ? 1

   (b) How does a microprocessor differentiate between an Opcode and Data ? 2

   (c) If the size of a memory chip is 1024 × 4 bits, how many such chips will be required to make up 16 Kbytes of memory ? 1

   (d) Design a 4 bit register (4 input lines and 4 output lines) to store 4 bits using flip-flops. 5

   (e) The starting memory address of a 2K byte memory chip is given as C000H. Specify the last memory address of the chip. 2

[Turn over

(f) What is the function of accumulator ? 2

(g) Calculate the number of registers in a 32K memory board. 1

(h) Draw the timing diagram of STA E034H instruction. 6

2. (a) In Fig-1 design the chip select logic Hardware with NAND gates so that the memory address range will be as indicated. 5

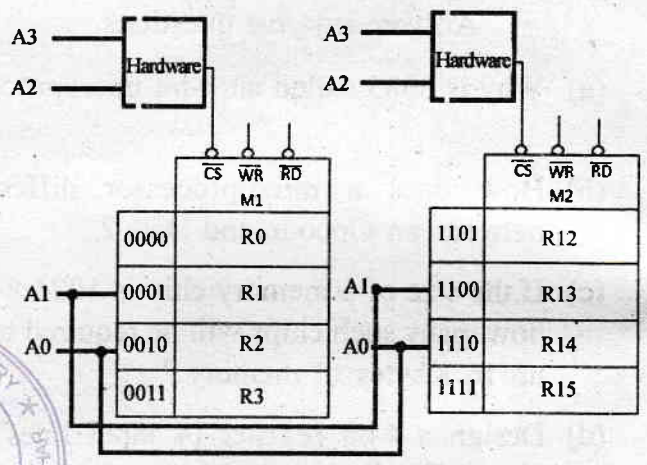


Fig. 1

(b) Make a comparison between Memory mapped I/O and I/O mapped I/O interfacing schemes. 6

(c) Write an Assembly language program for 8085 microprocessor to find the smallest number from a data array of 10 numbers. 7

(d) Identify the m/c cycles of the following two instructions : 2

SUB B ;

ADD M.

3. (a) State the functions of the signals : 2

ALE, $IO/\overline{M}$.

(b) If the clock frequency is 5 MHz, how much time is required to execute instruction of 18 T-states ? 1

(c) Write an Assembly language program for 8085 microprocessor to exchange the contents of memory block D000H-D004H with that of E000 H-E004H. 7

(d) Name the flags in 8085 microprocessor and explain them with a suitable example. 5

(e) What do you mean by fold back or mirror memory ? Illustrate with an example. 5

4. (a) Calculate the COUNT to obtain a 100 μSec loop delay and express the value in Hex. 8

		T-States
	MVI B, COUNT	4
LOOP :	MOV A, B	4
	NOP	4
	DCR A	4
	JNZ LOOP	10/7

(b) Explain how many times the following two loops will be executed : 6

(i)
```
    LXI B, 0007H
LOOP : DCX B
       JNZ LOOP
```

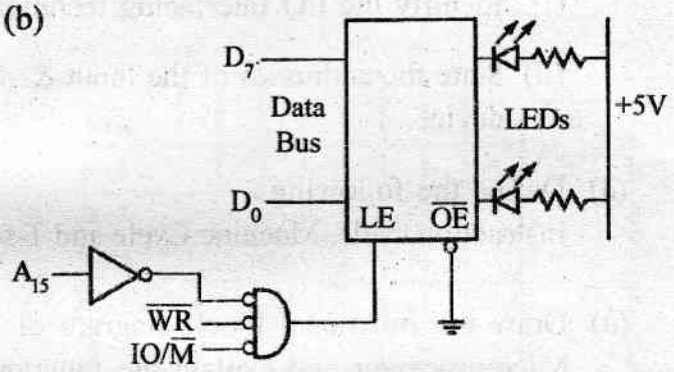
(ii)
```
    LXI B, 0007H
LOOP : DCX B
       MOV A,B
       ORA C
       JNZ LOOP
```


(c) Draw an interfacing circuit for a 4 Kbyte EPROM using a 3 to 8 decoder such that the memory address range will be F000H-FFFFH. 6

5. (a) Assemble the following program starting with memory address 20F6H and specify the total number of bytes consumed and contents of ML : 3050H after the execution of the program : 6

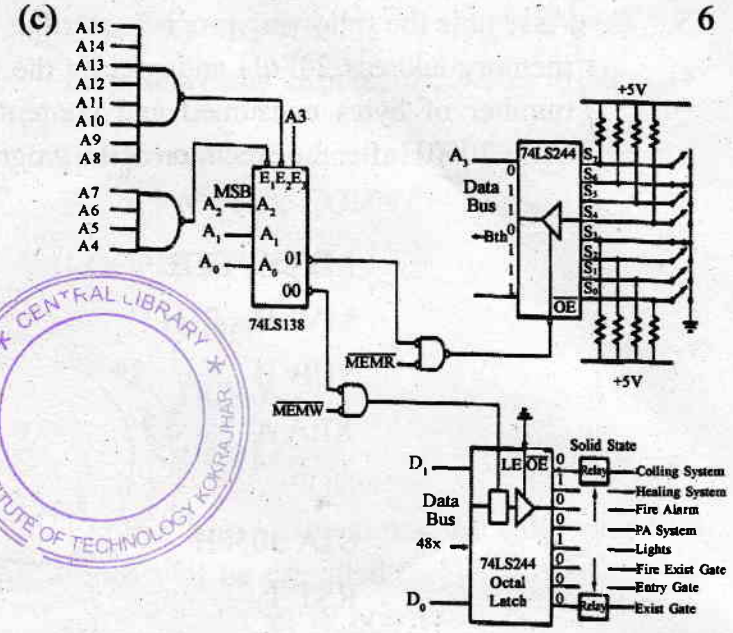
```
MVI A, FFH
MVI B,  01H
SUB B
XRA A
NOP
STA 3050H
RST 1
```


(b)



Can you recognize whether the above is I/O mapped I/O or memory mapped I/O scheme ? What is the PORT address if all the don't care lines are assumed to be zero ? 5

(c) 6



(i) Identify the I/O interfacing technique.

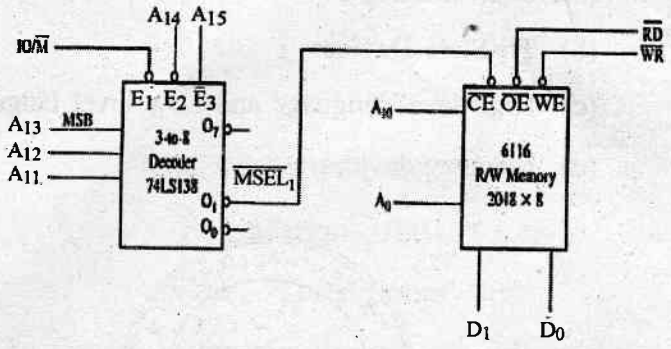
(ii) State the addresses of the input & output device.

(d) Define the following : 3
Instruction cycle, Machine Cycle and T-states.

6. (a) Draw the functional block diagram of 8085 Microprocessor and explain the functions of each blocks. 8

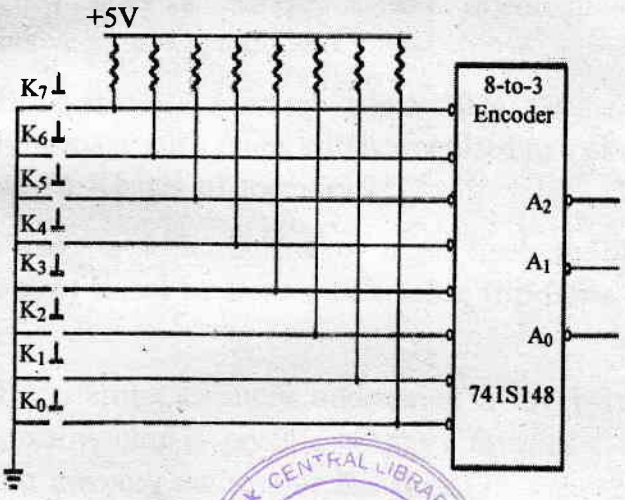
(b) State the need to demultiplexing the bus AD0-AD7. How is demultiplexing done ? 3

(c) 6



In the above figure, exchange the address lines A12 and A14, and identify the memory map.

(d) What is the output of the priority encoder if the key K3 is pushed ? 3



7. Write short notes on : 5×4=20

(a) 8085 interrupts

(b) Tri-State Devices

(c) High level language and Low level language

(d) Memory devices.