

RE-6787-88

B. E. - III (Sem. V) (EC/ECC/IC) Examination
May/June - 2008

Microprocessor Programming & Interfacing

Time : 3 Hours]

[Total Marks : 100

RE-6787

Instructions :

(1)

नीचे दिये गए विवरणों के अनुसार उत्तर दीजिए।
Fillup strictly the details of signs on your answer book.

Name of the Examination :

B. E. - 3 (Sem. 5) (EC/ECC/IC)

Name of the Subject :

Microprocessor Programming & Interfacing

Subject Code No.

6 7 8 7

Section No. (1, 2, ...)

1

Seat No.:

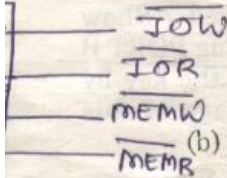
5 0 6 0 9 8

Student's Signature

- (2) Attempt all questions.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data whenever necessary.
- (5) Use of scientific calculator CASIO fx-8283, fx-100 or equivalent of other companies is allowed.

1 (a) Answer the following in brief :

- $I_0 = 0$
 $R_D = 0$
 $W_R = 0$
- (i) State the function of following 8085 pins
(a) Ready (b) HOLD
 - (ii) What is bus contention ? How to avoid it ?
 - (iii) Show the control-signal (\overline{IOR} , \overline{IOW} , \overline{MEMW} , \overline{MEMR}) generation using 74138 decoder from the control signals available from 8085 chip.



- (iv) Explain in brief BSR mode of operation of 8255 chip.
 - (v) State important features of 8279 chip.
- (b) With the neat diagram show the demulti-plexing of $AD_7 - AD_0$ lines using 74.373 latch. Explain the working.

- (c) Explain the flag register of 8085. State importance of each flag bit. Which instruction uses auxiliary carry flag ?

10

5

5

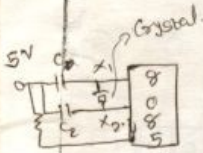
[Contd.]

clock

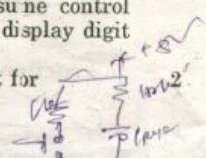
1

2 (a) Assume that the accumulator contains data byte 82 H and the instruction MOV C,A (opcode - 4FH) is fetched by microprocessor from the memory. Using the neat diagram explain the steps in decoding and executing the instruction by 8085 hardware. 6

(b) Design I/O interfacing to interface a I/O mapped common anode seven segment LED display using latch 74373 at address F5H. Use absolute decoding with 74138 decoder a four input NAND gate and a NOR gate. Assume control signals are available. Write a program to display digit '7' on output port.



(c) Draw and explain power ON reset circuit for 8085 microprocessor.



OR

(a) You are given 2732 EPROM chips. How would you construct a 32 k Byte EPROM board which can be interfaced with 8085. The starting address is 0000H. Show all necessary interfacing connections and memory map. Assume control signals are available. 8

(b) Interface DAC 0809 to 8085 microprocessor using 8255 and latch 74373. Assume suitable address the latch is enabled by pin \overline{PB}_0 of 8255 and PORT A is used to output data. Write a program to generate a square wave with 50% duty cycle using this scheme.

32
= 2⁵ x 2
7 = 2¹⁵
AS 14 A15

3 Attempt any three :

(a) Interface 8255 to 8085 using memory mapped I/O with control register address 8003H. Show address of all PORTS of 8255. Connect eight common anode LEDs to PORT A and four common anode LEDs to PORTC_U. Connect Eight DIP switches to PORTB and four DIP switches to PORTC_L. Write a program to configure 8255 in mode 0 and to read DIP switches and display the reading from PORT B at PORT A and from PORTC_L at PORTC_U. 15

(b) What is matrix keyboard? Why it is required? Show the interfacing of 20 key matrix keyboard using PORT B and C of 8255. Also explain how to identify the key by scanning the keyboard. What is disadvantage of this method?



(c) Explain mode 1 (monostable multivibrator) and mode 3 (Astable multivibrator) operation of 8254.

(d) Interface 8254 chip having control register address 83 H to 8085 microprocessor. Write a program to generate a 1 kHz square wave from counter 1. Assume clock input is 2 MHz and GATE is connected to + 5V.

(e) Draw the internal block diagram of 8279 and explain its working.

PA - 8255
PCU - 4
PB - 4
PCL - 4
in mode 0
Port A - 8255
PCU = 0
PB - 4
PCL - 4
mode 0

A ₁₅	A ₁₄	A ₁₃	A ₁₂
0	0	0	0
0	0	1	1
0	1	0	0

Instructions :

(1)

Fillup strictly the details of signs on your answer book.
 Name of the Examination : **B. E. - 3 (Sem. 5) (EC/ECC/IC)**
 Name of the Subject : **Microprocessor Programming & Interfacing**
 Subject Code No. **6 7 8 8** Section No. (1, 2, ...): **2**

Seat No. :

Student's Signature

BC ON
00
01
10
11 ON

- (2) Figures to the right indicate full marks.
- (3) Attempt all questions.
- (4) Assume suitable data whenever necessary.
- (5) Use of scientific calculator CASIO fx-82183, fx-100 or equivalent of other companies is allowed.

4 (a) Answer the following questions :

(1) Load the bit pattern 91 H in reg. B and 87 H in Reg. C. Mask all the bits except Do from Reg. B and Reg. C. If Do is at logic-1 in both reg; turn on the light connected to the Do position of o/p part c/H. Otherwise turn off the light.

(2) Explain the mathematical function that is performed by the following instructions :

MVI A, 07 H
RLC
MOV B, A
RLC
RLC
ADD B.

A = 07
B = 0E

A = 38
B = 0E

A = 48

00000111
00001110
00111000
38

(3) What is stack ? What is stack pointer ?

(4) How long INTR pulse stay high ? 17.5 T

(5) List out edge trigger interrupt. Explain it in brief.

(6) Write prog to enable all interrupt.

FI
MVI A, 08
SIM.

(b) Draw and explain timing diagram for instruction XTML. *Draw*

(c) Explain the following instructions with example and all flag contents. *No flag affected*

- (1) SHLD
- (2) LDAX
- (3) PCHL. Load Program Counter with HL contents

MVI B, 91
MVI C, 87
MOV A, B
ANI 0
MOV D, A
MOV A, C
ANI 01
ANA B
RRC
RLC
JC set
HLT
LEO 0bb

Set
LED ON

Store HL into Direct

SHLD 8000 HL
8000 50
8001 20

Load ACCU. Direct

LDAX D A = D
D = 05 A = 05

5 Attempt any two :

- (1) Write the bit patterns to set the interrupts and to sense the pending interrupts. Explain it with example. 14 7
- (2) Explain the role of priority encoder in interrupt with example. 7
- (3) Write a prog. to implement a break point facility at RST 5 for user. When interrupt to their display the accumulator content and flags when HEX key 'C' is pressed. Exit the break point routine and continue execution when the zero key is pressed. 7

Page No. 294

Assume that when a keyboard routine is called it returns the binary key code of the key pressed in the accumulator.

6 Attempt any two :

- (1) Write assembly language prog to convert 8-bit binary to Gray code. Also write the algorithm for the same. Ten such numbers are stored in memory. 16 8
- (2) Write short note on DMA and DMA controller IC 8257 interfacing. 8
- (3) 10 Hex no. are stored at location starting from D500H. Convert that in BCD and store that at location starting from D600H. 8

```
PUSH PSW
PUSH B
PUSH D
PUSH H
KYCHK: CALL KYBD
CPI 00
JNZ RETKY
LXI H, 0007
DAD SP
MOV A, M
OUT PORT-1
DCR H
MOV A, M
OUT PORT-2
JMP KYCHK
```

{for key C}

```
RETKY: CPI 00
RE-6787-88]
JNZ KYCHK
```

```
POP B
POP D
POP B
```