

DK-6787-88

B. E. - III (Sem. V) (EC/ECC/IC) Examination
November/December - 2007

Microprocessor Prog. & Interfacing

Time : 3 Hours]

[Total Marks : 100

DK-6787

Instructions :

(1)

નીચે દર્શાવેલ વિગતો ઉતારવડી પર સવચ્છ લખવી.
Fillup strictly the details of signs on your answer book.

Name of the Examination :

Name of the Subject :

Subject Code No. : Section No. (1, 2,.....) :

Seat No. :

Student's Signature

- (2) Attempt all questions.
 (3) Figures to the right indicate full marks.
 (4) Assume suitable data wherever necessary.
 (5) Use of scientific calculator (CASIO - fx - 82/83 or equivalent) is permitted.
 (6) Answer to the two sections must be written in separate answer book.

- 1 (a) Answer the following questions : 10
- (i) State the function of stack pointer (SP) register.
 - (ii) Explain the function of XTHL instruction with one example.
 - (iii) Identify the addressing mode of the instruction : SHLD 9000 N.
 - (iv) If the clock period of 8085 is 0.2 μ s, calculate the time required to execute the instruction RAR.
 - (v) Which interrupt has highest priority in 8085 ? Which interrupts is nonmaskable in 8085 ?
 - (vi) Give a single instruction to divide the even number in A register by 2. $\rightarrow RRC$
 - (vii) Why interrupts driven data transfer is more efficient than programmed data transfer ? \leftarrow
 - (viii) How many interrupts can be serviced using one 8259 IC ? $\rightarrow 8 (IR_0 - IR_7)$
 - (ix) What is the content of carry flag if ANA B is executed ? $CY \rightarrow \text{reset}, AC \rightarrow \text{Reset}$
 - (x) Why no interrupts acknowledge cycle is required for RST 7.5 interrupts ?

DK-6787-88]

[Contd...

$T = \frac{N \times T}{F}$
 $= \frac{4 \times 0.2 \mu s}{1}$
 $= 0.8 \mu s$

(b) Draw and explain timing diagram of LXI H, 2000 H instruction. 10

2 Attempt any two : 16

(i) Write a program to convert a hex. number (8-bit) stored at location C200H into its BCD equivalent. Use subroutine. Also explain your algorithm clearly. hex ->

(ii) Write a program to count the number of upper case and lower case letters in a given string stored at location C200H onwards. The location C300H stores the length of the string in bytes store the counts at locations C301H and C302H. Explain your algorithm clearly.

(iii) Write a program to solve the boolean equation :

$F = A'BC + B'D + C'A$. Here A, B, C, D are boolean values (bits) connected to bit D_3, D_2, D_1 and D_0 respectively of an input port having address FFH. Display output at D_0 bit of port OOH.

3 (a) What are different hardware interrupts in 8085 ? Explain internal block diagram of 8085 interrupt system with the details of triggering and vector address. 8

(b) Give the internal block diagram of 8259 IC and explain the function of this IC in brief. 6

OR

3 (a) What are various software interrupts in 8085 ? Give their locations and explain its usefulness. 4

(b) Explain the use of EI, DI, SIM and RIM instructions in interrupt programming. 4

(c) Write a program to implement a real time clock (RTC) using RST 7.5 interrupt and 1 Hz square wave generator. Use three registers to store hours, minutes and seconds of clock and inbuilt display routine is available to display them. 6

DK-6788

Instructions :

(1)

नीचे दशांक में निम्नलिखित विवरणों को भरना है।
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 Prog. & Interfacing**

Subject Code No. : **6 7 8 8** Section No. (1, 2, ...): **2**

Seat No. : **200695**

Student's Signature
Student's Signature

- (2) Attempt all questions.
- (3) Figures to the right indicates full marks.
- (4) Assume suitable data wherever necessary.
- (5) Use of scientific calculator (CASIO - fx - 82/83 or equivalent) is permitted.
- (6) Answers to the two sections must be written in separate answer book.

4 (a) Write in brief : 16

- (i) What is the content of the program counter after fetching 8 bit / 16 bit data from a memory location 3065 H ? The instruction to fetch the data resides at 5123 H.
- (ii) If the 8085 adds 58 H and A8 H, specify the content of accumulator and the status of the S, Z and CY flags.
58
A8
D7-1 -log
0-101
- (iii) Discuss following signals : ALE, HOLD, SID, READY.
1010 1000
1000 1000
- (iv) Why does bus contention occur ? How can it be avoided ?
- (v) Where does the stack pointer reside ? What is stack ?
- (vi) Can 'Bit Set Reset operation' change PC0, if both port A and port B are in mode 0 and port C lower is being used as output ?
- (vii) What are tri-state devices and why they are essential in a bus oriented system ?
- (viii) What do you mean by wait state. When and how it can be inserted ?

(b) Design a circuit which provides lower order address 4 bits during a whole machine cycle. 4

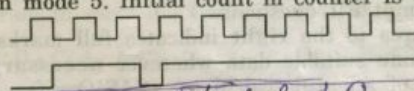
5 Attempt any two of the following :

(a) Draw the complete interfacing schemes used to interface 8

EPROM 27128 (16 K EPROM) at address 0000H and
Two RAM 6116 (2 K RAM) next to EPROM

with 8085 using full decoding scheme. Memory shadow
should not be there. Draw memory map and show all
required control signals.

(b) (i) For the CLOCK and GATE waveforms given 8
below, draw the output waveform of counter 0 of
8253 in mode 5. Initial count in counter is 5.

W/f : 

(ii) Draw an interfacing circuit to interface 8253 timer
with 8085.

(c) Discuss the internal architecture of 8085 with block 8
diagram. Draw status register and explain.

6 Attempt any two of the following :

(a) Draw a schematic to interface a 16-key matrix 7
keyboard using port C of the 8255. Write instructions
to initialize the port.

(b) (i) What is handshaking ? How it is used in 7
asynchronous data transfer between CPU and I/O
devices ?

(ii) What is two key lock and N key roll over ?

(c) What is DMA ? Using a block diagram, explain how 7
the data is transferred using a DMA controller.

POP B
POP PSW