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RN-7403

B. E. - IV (Sem. VII) (Electrical) Examination

May / June – 2010

Microprocessor & Its Application To Electrical Engg.

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. - 4 (Sem. 7) (Electrical)**

Name of the Subject :

☛ **Microprocessor & Its Application To Electrical Engg.**

☛ Subject Code No. : **7 4 0 3** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Answer all questions.
(3) Answer to the two sections must be written in **separate** answer books.
(4) Figures to the right indicate **full** marks.
(5) Assume necessary data wherever required.
(6) Write algorithm or draw the flowchart showing program logic.
(7) Scientific calculator up to Casio-100D, 100MS series is permitted.

SECTION – I

Q-1 **(a)** **Fill in the following blanks:** **(05)**

1) _____ Memory can be erased and programmed block wise.
2) In order to address 8Kbyte of memory, the number of address line required is _____.
3) _____ signal is used to de-multiplex the multiplexed AD0-AD7 bus.
4) If the memory chip size is (1024 x 8) bits, the number of chips required to make up 32K (1024 bytes) of memory are _____.
5) _____ Programmable peripheral chip is required to be interfaced for keyboard/seven-segment display.

(b) Explain T-state, machine cycle and instruction cycle. **(03)**

(c) **Explain functions of following pins of 8085:** **(04)**
(i) INTR (ii) HOLD

(d) Explain the functionality of various flags of 8085. **(05)**

(e) What is the function of Program Counter and Accumulator? **(03)**

Q-2 **Attempt any three questions.** **(15)**

(1) Draw and explain the timing diagram of LXI H, 1030H instruction.
(2) Draw an interfacing scheme to interface seven segment common-cathode LED with 8085 and write instruction to display 8.
(3) Explain the 8085 stack memory organization. What are the various uses of stack memory?

(4) i) Explain the control word format of 8255. (02)
ii) Explain BSR mode of 8255. (03)

(5) Explain the CALL instruction execution. How much time is required to execute the CALL instruction with 8085 operating at 3 MHz clock?

Q-3 **Attempt any two.** (15)

(1) Draw interfacing scheme for one (4K x 8) RAM & two (8K x 8) ROM with 8085. Identify its address range.

(2) Draw an Interfacing scheme to interface 8253 with 8085. Specify the address decoding. Explain control word format of 8253.List various modes of 8253.

(3) Design the hardware scheme for safety control system using peripheral mapped I/O technique with F8H as input port address and F9H as o/p port address. The scheme interfaces 8-switches and 8-appliances and control (ON/OFF) the appliances as per the status of s/w (ON/OFF).

SECTION-II

Q-4 **(a)** **Fill in the following blanks.**

1) JZ 5000H is ____ byte instruction. (01)

2) The addressing mode of STAX B is _____. (01)

3) The 8- bit number required to be loaded in A register before execution of SIM instruction to enable only RST 5.5 interrupt is _____ H. (02)

4) If A=35H and C=1, then after execution of RAR instruction the content of A=_____ and the status of carry flag is_____. (02)

5) The content of A=_____ and CY=_____after the execution of following set of instructions: (02)

```
LXI H 2070H
MVI M,8FH
MVI A,64H
CMP M
```

(b) Compare RST and CALL instruction. (04)

(c) How many times the following LOOP will be executed? (02)

```
        MVI A, 71H
LOOP:   RAL
        JNC  LOOP
```

(d) What do you mean vectored and non vectored interrupts? Explain 8085 vectored interrupts. (06)

Q-5 **Attempt any three.** (15)

(a) Write a delay loop to provide a delay of 0.5 msec and hence using the delay loop write a program that generates a square wave of 1KHz on PC7 pin of 8255. Assume 8085 is operating at 5MHz clock. Also show delay calculations.

(b) Write a program that multiply an 8-bit binary number available in memory at 5000H with an 8-bit binary number available in memory at 5001h and store the result in memory at 6000H (lsb) and at 6001H (msb).

(c) A set of certain data bytes are stored in memory starting from 4000H. The end of data byte is indicated by FFH. Write a program that check each byte and transfers only those numbers that are positive as well as even to a new memory location starting from 5000.

(d) Write a subroutine that converts hex number into its equivalent ASCII and hence using it write a program to convert an 8-bit binary number into its equivalent ASCII.

(e) Write a program to perform following addition.
$(13051976)_{10} + (29121981)_{10} + (30122008)_{10}$

Q-6 **Attempt any two.** **(15)**

(a) Write a main program to count continuously in binary with a one second delay between each count and display the count on port 20H. When RST7.5 interrupt is given execute an Interrupt Service Routine that flashes FF five times with some appropriate delay between each count on port 20H and then continue with the original task.

(b) Draw and explain an interfacing scheme to provide multiple hardware interrupt on single INTR line and discuss about the priority.

(c) Draw an interfacing scheme to interface ADC0801/ADC0804 with 8085 and draw the timing diagram for read-write operation. Write instruction to read data from ADC. **(05)**