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SF-7129

B. E. III (Sem. VI) (IC) Examination

May / June – 2011

Microcontroller Programming & Interfacing

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. 3 (Sem. 6) (IC)**

Name of the Subject :

☛ **Microcontroller Programming & Interfacing**

☛Subject Code No. : **7 1 2 9** ☛Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Attempt all questions.
(3) Figure to the right indicates marks.
(4) Answer of two sections must be written in separate answer books.

1 (a) Give the answers in brief : **10**

(i) Which two pins of port 3 are used for serial communication ? **2**

(ii) Explain the function of RESET pin in 8051 microcontroller. **2**

(iii) What is the ROM size of 8051 ? **2**

(iv) Explain the use of SWAP A instruction. **2**

(v) What is the difference between PORT0 and PORT1 ? **2**

(b) Name the different addressing modes supported by 8051 and explain any 1 of them in detail. **8**

2 (a) Draw and explain the RAM memory structure for 8051. **8**

(b) Calculate the time delay for the given below loop. **8**
Assume the crystal frequency to be 12 MHz.

```
DELAY :                 NO. OF MACHINE CYCLES
      MOV R2,#20                1
AGAIN :
      MOV R3, #50               1
HERE :
      DJNZ R3, HERE             2
      DJNZ R2, AGAIN            2
      RET                       2
```

OR

2 (a) Explain with example the use of PUSH and POP instruction with the help of example. 8

(b) Calculate the time delay for the given below loop. Assume the crystal frequency to be 11.0592 MHz. 8

DELAY :	NO. OF MACHINE CYCLES
MOV R2,#200	1
AGAIN :	
MOV R3,#250	1
HERE :	
NOP	1
NOP	1
DJNZ R3, HERE	2
DJNZ R2, AGAIN	2
RET	2

3 Answer any **three** : 16

(i) Explain in short all the assembler directives.

(ii) Name two special function registers in 8051 along with their respective addresses.

(iii) Draw and explain the power-on reset circuit for 8051 microcontroller.

4 (a) Give the answers in brief : 10

(i) What is the difference between timer and counter mode of operation ?

(ii) How many timers does 8051 have ? Name them.

(iii) The maximum time delay that can be generated by using timer in mode 2 is _____.

(iv) Which register is used to store data to be transmitted or received during serial communication ?

(v) What is the length of SBUF register ?

(b) Explain the importance of AC Flag bit. 8

5 (a) Explain with neat sketch the 8051 connection with stepper motor. 8

(b) Write a program to rotate the stepper motor continuously. 8

OR

5 (a) Draw the interfacing circuit connecting a matrix keyboard with 8051 as follow : 8
P1.0 - P1.3 connected to rows
P2.0 - P2.3 connected to columns.

(b) For the above interfacing, write a program to test which key is pressed. 8

6 Answer any two questions : **16**

(a) Draw and explain the structure of TMOD register. Explain the importance of each bit.

(b) Write down the steps to program 8051 to receive data serially.

(c) Write down the steps followed by 8051 in executing an interrupt.
