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· Printed Pages—4 **EIC601**

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2522 **Roll No.** | | | | | | | | | | |

B.Tech.

(SEM. VI) THEORY EXAMINATION 2011-12

MICROCONTROLLER

Time : 3 Hours *Total Marks : 100*

Note :— (1) Attempt **all** the questions.

(2) All questions carry equal marks.

1. Attempt any **two** parts of the following :— **(10×2=20)**

(a) Why it is not possible to protect a microprocessor based system from software piracy ? What are the advantages of micro-controller over microprocessor ?

(b) Give the format of PSW of 8051. What is the difference between CY and OV flags of PSW ? Why is there no sign flag in 8051 ?

(c) What do you mean by addressing mode ? How many addressing modes are there in 8051 ? Give one example of each type.

2. Attempt any **two** parts of the following :— **(10×2=20)**

(a) How does an instruction differ from a directive ? Discuss the different types of assembler directives of 8051. Why are the ORG and END directive also called pseudocode ?

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(b) What is the size of stack pointer register (SP) of 8051 ? Does the stack of 8051 grow upwards or downwards ? Show the stack and stack pointer for each line of the following program :

```
ORG 0
MOV SP, #70H
MOV R5, #66H
MOV R2, #7FH
MOV R7, #5DH
PUSH 5
PUSH 2
PUSH 7
CLR A
MOV R2, A
MOV R7, A
POP 7
POP 2
POP 5
```

(c) Which port of 8051 does not have any alternate function and can be used solely for I/O ? Which port of the 8051 is bit addressable ? What are the advantages of bit address-ability of 8051 port ? Write a program to monitor the P 2.7 bit, when it is low, send 55 H and AAH to P0 continuously.

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3. Attempt any **two** parts of the following :— **(10×2=20)**

(a) Draw and discuss the format and bit definitions of the following SFRs of 8051 :

(i) TMOD

(ii) TCON

(b) What are the advantages of serial communication over parallel communication ? Distinguish between half duplex and full duplex mode of communications. Show the framing of the letter ASCII "A" (41H), no parity, 1 stop bit.

(c) What is difference between RET and RETI instructions ? Explain why we can not use RET instruction instead of RETI as last instruction of a ISR.

4. Attempt any **two** parts of the following :— **(10×2=20)**

(a) Write a program in which 8051 reads data from P1 and write it to P2 continuously while giving a copy of it to the serial communication port to be transferred serially. Assume that XTAL = 11.0592 MHz. Set the baud rate at 9600.

(b) Explain the interrupts of 8051. How can they be enabled and disabled ? How priority can be assigned ?

(c) Explain the role of pins $\overline{\text{PSEN}}$, $\overline{\text{RD}}$ and $\overline{\text{WR}}$ accessing external memory connected to 8051. Show the connection of an 8051 to a single 256 K × 8 NV-RAM chip.

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5. Attempt any **two** parts of the following :— **(10×2=10)**

(a) Why do we put a driver between the microcontroller and the stepper motor ? A switch is connected to pin P2.7. Write a program to monitor the status of switch and perform the following :

(i) If switch (SW) = 0, the stepper motor moves clockwise.

(ii) If switch (SW) = 1, the stepper motor moves anticlockwise.

(b) Show the design of 8255 connections to 8051 where port A has address 88 H. Then program the 8255 to get data from port C and send it to both ports A and B.

(c) Enlist the salient features of 8096 microcontroller and explain the important blocks of its architecture.