

Registration No. :

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Total number of printed pages – 3

B. Tech
PEEI 5401

Seventh Semester Examination – 2013
MICROCONTROLLERS AND APPLICATIONS

BRANCH : EC, BIOMED, ETC

QUESTION CODE : C-230

Full Marks – 70

Time : 3 Hours

*Answer Question No. 1 which is compulsory and any **five** from the rest.
The figures in the right-hand margin indicate marks.*

1. Answer the following questions : 2×10
- (a) What do you mean by the term embedded microcontroller and external memory devices ? Atmel 89C2051 is the example of which type.
- (b) Write the instructions of 8051 microcontroller to push the contents of the following registers to the stack.
- (i) A
- (ii) R3 of register bank 3
- (c) Discuss the function of RS1 and RS0 bits in PSW of Intel 8051.
- (d) What does the status of EA pin affect the access to internal and external program memory ?
- (e) What is the difference between the following two instructions in terms of addressing modes and function performed ?

MOV A, #46h

MOV A, 46h



P.T.O.

- (f) What is assembler ? What is the meaning and advantage of EQU directive ?
- (g) How many bits are serially transmitted at a time in mode 2 of serial communication in Intel 8051 ? Calculate the baud-rate in mode2 at 12 MHz oscillator frequency.
- (h) List the different members of Atmel microcontrollers. What is the difference in architecture of 8051 and 89C51 microcontrollers ?
- (i) What are the various addressing modes in PIC microcontrollers ? What is the role of FSR and INDF register in PIC 16C71 ?
- (j) Write the PIC instruction to clear the Watch dog timer and W register.
2. (a) List the special function register associated with the Timer/ Counter of MCS-51microcontrollers. Explain about the Mode select register of Timer/ Counter 5
- (b) Write an 89C51 based ASM program to generate a 2 KHz square wave at P1.0 of Port 1. Assume Timer 0 auto-reload mode generating the necessary delay. 5
3. (a) Draw the neat sketch of DAC interfacing with Atmel 89C51 microcontroller. What is pin 3.6 of Atmel 89C2051 ? 5
- (b) Write a program of Atmel 89C2051 microcontroller for stair case ramp generation. 5
4. How many interrupts are supported by PIC 16F877 flash microcontroller ? Explain about the SFRs associated with interrupts of the same. 10
5. a) With the necessary diagram explain about the Quasi-bi-directional Port structure of 8051 microcontroller. Which ports of the 8051 microcontroller are designed using the above structure ? 5
- (b) Write a PIC based 8-bit addition program and display the result on the LEDS connected at PORT B. 5

6. (a) Explain about the following instructions with the necessary example : 5
- (i) Movlw k
 - (ii) clrf f
 - (iii) sleep
 - (iv) MOVC A, @ DPTR + A
 - (v) bcf f, b
- (b) Program for multiplication of two floating point numbers. 5
7. (a) Write a program to generate a pulse of .5ms on P1.0 pin of 89C2051, triggered by INT0 interrupt. Assume XTAL = 12 MHz. 5
- (b) Write an ASM program to unpack a packed BCD number. 5
8. Write short notes on any **two** of the following : 5×2
- (a) Watch dog timer
 - (b) Internal RAM organization of Intel 8051
 - (c) Comparison table for Atmel microcontrollers
 - (d) Power Saving options.

