(Pages : 3) **1500**

Reg. No. : .....

Name : .....

Sixth Semester B.Tech. Degree Examination, April 2014
(2008 Scheme)
08.601 : MICROCONTROLLER BASED SYSTEM DESIGN (TA)

Time: 3 Hours Max. Marks: 100

PART – A

(Answer **all** questions. **Each** question carry **4** marks) :

1. Differentiate between :
   a) XCHD A, @ Rp and XCH A, @Rp
   b) RET and RETI.
2. Write a program to achieve the Pseudo operation in 8051 : DEC DPTR.
3. What are the operating modes of timers in 8051 ?
4. Explain the relevance of sleep mode in embedded systems.
5. Explain the function of the following pins of 8051 :
   a) PSEN
   b) INT0.
6. What are the exceptions/interrupts in ARM ?
7. Describe the functionality of
   a) TRISA
   b) FSR in PIC.
8. Write notes on watch dog timer.
9. Explain the use of TI and RI in serial communication.
10. Illustrate the usage of SPSR in ARM with appropriate examples.

P.T.O.

PART – B

(Answer **any 2** questions from **each** Module. **Each** question carries **10** marks) :

Module – 1

11. Write a assembly program to sort all even numbers in ascending order from the given array of 8 bit numbers.

12. Two Switches (SW 1 and SW 2) are connected to P1.7 and P1.6 of an 8051 based system. Write a assembly level program to perform the following task as per the table. Assume data reside in Code ROM and no. of data is stored in the first location.

SW2	SW1	Task
0	0	Unsigned addition
0	1	Signed addition
1	0/1	BCD packed addition

13. With neat block diagram explain the internal architecture of 8051.

Module – 2

14. A data acquisition system is attached with a power plant to measure and monitor a few process variables, design a temperature monitoring module for the same. Write an assembly level program for measuring the temperature and sending the value through serial port at a baud rate = 9600 at a XTAL = 11.0592 MHZ. (State your assumptions clearly)

15. Describe the various modes of operation of timer 1 in PIC 16F877.

16. a) Assume that XTAL = 22MHZ and we are generating a square wave on P1.7 of 8051. Find the lowest square wave frequency generated using model of timer 0. (Neglect instruction overhead)

    b) Obtain the output of the following program. (XTAL = 22 MHZ).

```
            MOV TMOD,#02
LABEL 2 :   CPL P1.2
            MOV R0,#0A
LABEL 1:    MOV TH0,#48
            SETB TR0
HERE :      JNB TF0,HERE
            CLR TR0
            CLR TF0
            DJNZ R0,LABEL 1
            SJMP LABEL 2
```

Module – 3

17. a) Explain with relevant example ARM – Thumb inter working.

    b) Explain the pipeline stages in ARM 7.

18. a) What are various processor modes in ARM ? Explain.

    b) What do you meant by atomic operation ? Give an example.

19. a) Obtain the contents of the registers involved after executing the following instruction LDMIA r0!, {r1 – r3}

    Assume the following initial condition

Memory address	Data
0x80020	0x00000008
0x8001C	0x00000007
0x80018	0x00000006
0x80014	0x00000005
0x80010	0x00000004
0x8000C	0x00000003
0x80008	0x00000002
0x80004	0x00000001
0x80000	0x00000000

    r0 = 0x00080010 ;

    and r3, r2, r1 = 0x00000000

    b) What are the differences between ARM and Thumb instructions ?