

College of Engineering, Pune  
END SEMESTER EXAMINATION - May 2012  
S.Y. - B.Tech (Electronics and Telecommunication)  
(ET 209)- Microprocessors and Microcontrollers

Date- 12/05/2012  
Time- 9am-12noon

Max.marks- 50  
Duration - 3 Hrs

Instructions:

1. All questions are compulsory.
2. Neat Diagrams must be drawn wherever necessary.
3. Assume suitable data, if necessary.
4. Figures to the right indicate full marks

- Q.1 A. What is the use of interrupts in microprocessor systems? With suitable examples explain the sequence of operations done by a 8085 microprocessor when it is interrupted. Is there a minimum pulse width required for the interrupt signal? 05
- B
1. What happens if interrupts INT0, TFO, INT1 are activated at the same time. 05
  2. What are the source and sink current for I/O pins of 8051 microcontroller.
- Q.2 Solve any Five 10
1. What is the difference between RET and RETI instruction?
  2. Exchange the nibble of 8-bit data without using swap instruction
  3. Explain the power saving modes of the 8051.
  4. What is the difference between SJMP and LJMP?
  5. With XTAL=11.0592MHz, find the TH1 value needed to have the following baud rate a. 110 b. 150 c. 300
  6. Explain what will happen when instruction "DIV A, R1 with A=3 and R1=9 gets executed. Justify your answer
- Q.3 A Explain the following terms with respect to serial communication 05
1. Half and full duplex 2. framing 3. RS232 standard 4. Baud
- B Write a program to send a block of 100 characters to serial port from external data RAM starting at location 2000h. Send each character as 9 bits, parity bit exists as 9<sup>th</sup> bit. Use baud rate as 19200 baud 05
- Q.4 A. Write short notes on ( any two) 05
- a. RISC vs CISC
  - b. CCP module
  - c. I2C module
- B Explain the addressing modes of PIC microcontroller with suitable examples. 05

PTO

Q. 5

8051 has DAC connected to an I/O port. It is also connected to a PC via serial port. When 8 bit data character is received from PC, it interrupts 8051 through serial port and received 8 bit data value is passed to DAC which is controlling a DC motor. Write an assembly language program to implement this system. Assume baud rate of 9600 baud. At the same time continuously generate square wave of 1KHz with 66% duty cycle. Assume crystal frequency as 11.0592 MHz. Draw the interfacing diagram.

**PCON – Power Control Register**

D7	D6	D5	D4	D3	D2	D1	D0
SMOD	x	x	x	GF1	GF0	PD	IDL

**TCON – Timer Control Register**

D7	D6	D5	D4	D3	D2	D1	D0
TF1	TR1	TF0	TR0	IE1	IT1	IE0	IT0

**SCON – Serial Control Register**

D7	D6	D5	D4	D3	D2	D1	D0
SM0	SM1	SM2	REN	TB8	RB8	TI	RI

**TMOD – Timer Mode Control Register**

D7	D6	D5	D4	D3	D2	D1	D0
Gate	C/T	M1	M0	Gate	C/T	M1	M0
Timer 1				Timer 0			

**IE – Interrupt Enable Register**

D7	D6	D5	D4	D3	D2	D1	D0
EA	x	ET2	ES	ET1	EX1	ET0	EX0

**IP – Interrupt Priority Register**

D7	D6	D5	D4	D3	D2	D1	D0
x	x	PT2	PS	PT1	PX1	PT0	PX0