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Fourth Semester B.E. Degree Examination, June/July 2013
Micro Controllers

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer FIVE full questions, selecting
atleast TWO questions from each part.**
2. Missing data, if any, may be suitable assumed.

PART – A

- 1 a. Explain with neat diagram, Harvard architecture and Von-Neumann architecture. (06 Marks)
b. Write the block diagram of 8051 micro controller and explain each block. (10 Marks)
c. Calculate the time required for one machine cycle :
i) At89C51 with crystal 22MHz
ii) DS5000 with crystal 11.59MHz. (04 Marks)
- 2 a. Name the bit addressable SFR's present in 8051 microcontroller with its address and write a program to realise the logic expression
 $Y = \overline{A}BC + A\overline{B}\overline{C}$. (06 Marks)
b. Explain the working of following instructions, with an example.
i) RLA ii) DAA iii) MOVC, bit iv) MOVC A, @RO. v) Atdptr v) XCHDO A, @RO. (10 Marks)
c. Write an assembly level program to subtract two sixteen bit numbers present in internal RAM location and store the result in external RAM location starting from 8000H. Assume that first sixteen bit number is present in internal RAM starting from address 10H and second sixteen bit number is present in internal RAM starting from memory location 12H. (04 Marks)
- 3 a. What is the difference between jump and call instruction. Explain the ranges associated with different types of jump instructions. (08 Marks)
b. With a diagram, explain the different steps that take place on execution of CALL and RET instructions. (08 Marks)
c. Find the content of accumulator after execution of each instruction :

\$ include <reg51.h>	Internal RAM	
org 0000H	Content	
MOV A, 25H	Address	Content
ADD A, 26H	00	25
DA A		
XCHD A, @RO	25	37
Here : sjmp here	26	25
end		
	7F	00
- (04 Marks)
- 4 a. Explain the different types bit logical operators present in 8051C. (06 Marks)
b. Write a program to toggle all the bits of P2 with a delay of 250 m seconds delay using 8051C. Use the exclusive OR operator. (08 Marks)
c. Write a 8051C program to send out the data AA H serially one bit at a time via P2.3. The serial transmission should start from LSB. (06 Marks)

PART – B

- 5 a. With a diagram, explain the start and stop of the timer 0 through pin P 3.2 when GATE bit in TMOD register is set to high. (06 Marks)
- b. Explain the steps to program timer 1 in mode 2 with a diagram. (06 Marks)
- c. Find the number to be stored in TH1 and TL1 register to generate the waveform shown in Fig. Q5(c). Also write the assemble level program to generate the waveform shown in Fig. Q5(c) on P3.1, using timer1. Assume the crystal frequency as 22 MHz. (08 Marks)

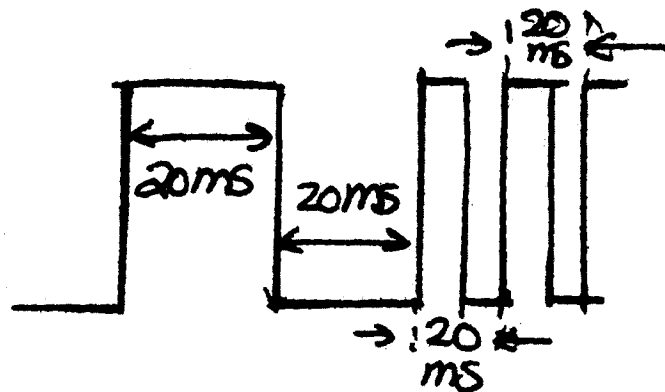


Fig. Q5(c)

- 6 a. What is the need for serial communication? Explain half duplex and full duplex transmission with the help of figure. (06 Marks)
- b. What is the need of SBUF register and explain all the bits of SCON register. (08 Marks)
- c. Write the programming steps to transfer data serially in 8051. (06 Marks)
- 7 a. What is the difference between polling and interrupts? Write the advantages and disadvantages interrupts. (06 Marks)
- b. Explain how external interrupts can be activated as level triggered and edge triggered in 8051 with the help of diagram. (06 Marks)
- c. Write a 8051 C program that continuously gets a single bit of data from P1.7 and send it to P1.0, while simultaneously creating a square wave of 200 μ s period on pin P2.5. Use timer 0 a create the square wave. Assume that crystal frequency used is 11.0592 NHz. Also send letter A to the serial port. Use baud rate 9600. (08 Marks)
- 8 a. Explain with a diagram, how the DAC 0808 can be interfaced to 8051 chip. Write a 8051C program to generate a square wave of frequency 10 KHz using OAC interface. (08 Marks)
- b. Explain the use of register select, read/write and enable pins of LCD. (06 Marks)
- c. Explain how a stepper motor can be connected to 8051 micro controller. (06 Marks)

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