

Model Question Paper-1

Subject: Microcontroller (18EE52)

Semester: 5th

Q.No.	UNIT – I		Bloom's Taxonom y Level	Marks
1.	a)	Explain With the neat diagram, the programming model of 8051 Microcontrollers.	L2	(08)
	b)	Illustrate the oscillator circuit and execution timing of 8051 microcontroller.	L3	(06)
	c)	Compare the Microprocessor and Microcontroller.	L4	(06)
UNIT – II				
2.	a)	Interface 4k bytes RAM and 8k bytes ROM to 8051 microcontroller in such a way that starting address of RAM is 1000H and ROM is C000H.	L5	(08)
	b)	Explain with example the various addressing modes of 8051.	L2	(08)
	c)	With simple block diagram explain the features of 8051 microcontroller.	L2	(04)
UNIT – II				
3.	a)	Define assembler directives. With example explain all the assembler directives supported by 8051 microcontroller.	L2	(08)
	b)	Write assembly language program to multiply 25 by 10 using repeated addition.	L3	(06)
	c)	Transfer the contents of the register A,R0,and R1,respectively of bank0 to the register B, R0 and R1 of bank1 using stack operations	L3	(06)
UNIT – III				
4.	a)	With circuit diagram explain the function Port 0	L2	(08)
	b)	Write an assembly language program to exchange the lower nibble of data present in external memory 6000H and 6001H.	L3	(06)
	c)	Write an assembly language program to toggle the bits of port P1	L3	(06)
UNIT – III				
5.	a)	Write 8051 program to generate square wave with $t_{ON} = 3ms$ and $t_{OFF} = 7ms$ on all pins of Port 0. System Clock is 22MHz. Use timer0 in Mode-1.	L3	(08)
	b)	Illustrate with diagram the significance of gate in TMOD register to control timer/counter module in 8051 microcontroller.	L4	(06)
	c)	Write an 8051C program to monitor the switch S0 and when pressed, it flashes the single LED0 ten times.	L3	(06)

6.	a)	Analyze different data types supported by 8051C Microcontroller.	L4	(08)
	b)	Assume that a 1-Hz external clock is being fed into pin T1(P3.5). Write a C programming for counter 1 in mode-2(8-bit auto reload) to count up and display the state of the TL1 count on P1. Start the count at 00H.	L3	(06)
	c)	Write a 8051 C program to toggle all the bits of P2 continuously 500ms. Use Timer 1, 16-bit mode to generate the delay. $f=11.0592\text{Hz}$	L3	(06)
UNIT – IV				
7.	a)	Compare polling and interrupts. What are the steps a microcontroller performs upon activation of Interrupt	L4	(08)
	b)	Write a C program for the 8051 to transfer "VTU Belagavi" serially at 9600 baud, 8-bit data, 1 stop bit, do this continuously.	L3	(06)
	c)	Explain the importance of TI and RI flags.	L2	(06)
8.	a)	Explain RS-232 hand shaking signals and specify the purpose of MAX – 232 while interfacing	L2	(08)
	b)	Explain how interrupt priority can be changed using IP register. Also explain the default priorities assigned to interrupts in 8051 microcontroller.	L2	(06)
	c)	Write a program that continuously gets 8-bit data from 'P0' and sends it to 'P1' where simultaneously creating a square wave of 200 μs period on pin P2.0. Use timer-0 to create square wave. Assume XTAL=11.0592.	L3	(06)
UNIT – V				
9.	a)	Interface LCD to 8051 and write an 8051 assembly/8051 C program to send MASTER to LCD display using busy flag.	L3	(08)
	b)	Explain the control word format 8255 IC. What is the control word for all the ports as out ports?	L2	(06)
	c)	Explain the construction and working of stepper motor. Explain the 4 Step sequence, step angle and steps per revolution.	L3	(06)
10	a)	How to interface DC motor to 8051 Microcontroller using optoisolator? Write a C program to move DC motor with 25% duty cycle Pulse	L3	(08)
	b)	Explain the salient features of an ADC. What are the signals of importance while interfacing such an ADC to a 8051 controller	L2	(06)
	c)	Write 8051 assembly program to rotate stepper motor 64 $^{\circ}$ in clockwise direction. The motor has step angle of 2 $^{\circ}$. Use 4 step sequence and draw the schematic diagram. Steps per revolution = 180, number of rotor teeth = 45. Movement per 4 step sequence = 8 $^{\circ}$	L3	(06)

Model Question Paper-2

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Q.No.	UNIT – I		Bloom's Taxonomy Level	Marks
1.	a)	Draw the block diagram of 8051 microcontroller. Explain the working of a. Stack and Stack pointer b. Program Counter and Data Pointer	L2	(08)
	b)	Compare CISC and RISC microcontrollers.	L4	(06)
	c)	Explain with the help of diagrams (connecting & timing) how to interface 32K EPROM and 16K RAM to 8051 microcontroller	L5	(06)
UNIT – II				
2.	a)	Describe the functions of various pins of 8051 microcontroller with pin diagram.	L2	(08)
	b)	Explain the memory organization in 8051 controller.	L2	(06)
	c)	Explain the bit pattern of Program status word (PSW).	L2	(06)
UNIT – III				
3.	a)	Differentiate JMP and CALL instructions. Explain with suitable diagram the jump and Call program range.	L4	(08)
	b)	Write a program to count the number of 1's and 0's of 8-bit data stored in location 6000H	L3	(06)
	c)	Write a program to compute 1+2+.....+N (say 15) and save the sum at 70H	L3	(06)
4.	a)	Explain with examples the operation performed by the following instructions? a). SWAP A b). MOV c,b c). DA A d). XCHD A,@R0	L2	(08)
	b)	Write an ALP to convert a packed BCD number into two ASCII numbers. Store the result in R5 and R6 respectively.	L3	(06)
	c)	Write an assembly language program to find the largest element from given array of data.	L3	(06)
UNIT – III				
5.	a)	What are the different ways to introduce a delay in 8051C. Give the three factors, which affect the accuracy of the delay	L4	(08)
	b)	In a home guard system, a door sensor is connected to the P1.0 pin, window sensor is connected to the P1.1 pin, and the siren is connected to P2.0. write an 8051 C program to monitor the door and window sensor. When any one gets open, sound the siren by sending a square wave of a few hundred Hz.	L3	(06)

	c)	Write a 8051 C program to toggle only bit P1.5 continuously every 50ms. Use Time 0, 16-bit mode to generate the delay. $f=11.0592\text{Hz}$	L3	(06)
6.	a)	Explain Mode-1 programming of 8051 timer. Describe the different steps to program in Mode-1.	L2	(08)
	b)	Write an 8051 C program to convert 1111 1011 (FBH) to decimal and then ASCII and display the digits on P0 sequentially (MSB first)	L3	(06)
	c)	Write an 8051 C program to send byte 24h serially one bit at a time via P2.0 send LSB first	L3	(06)
UNIT – IV				
7.	a)	Explain the bit contents of IE and IP registers.	L2	(08)
	b)	Write an 8051 C program to transfer the message "Work is worship" serially at 9600 baud rate, 8 bit data and one stop bit, continuously.	L3	(06)
	c)	Write a note on Asynchronous serial communication and data framing.	L3	(06)
8.	a)	Explain the bit contents of SCON and PCON registers.	L2	(08)
	b)	Write a C program using interrupts to generate a square wave on port pin P1.2 of 1kHz using timer-0 in mode 2.	L3	(06)
	c)	Explain how programming of external hardware interrupts is done in 8051 microcontrollers with a code snippet.	L3	(06)
UNIT – V				
9.	a)	What is PWM Technique? Explain bidirectional motor control using LM293 Chip. If SW=0, the dc motor moves clockwise and if SW=1, the dc motor moves counter-clockwise. Draw the schematic diagram. Write 8051 assembly program to do this.	L3	(08)
	b)	Show simple keyboard interface with port of 8051 & explain the scanning and identifying the key pressed.	L2	(06)
	c)	Interface a DAC to 8051 microcontroller and write an assembly language program to generate triangular wave using DAC interface.	L3	(06)
10	a)	With neat diagram write an assembly language program to interface ADC0804 to 8051 microcontroller.	L3	(08)
	b)	A switch is connected to pin P2.7. write a C program to monitor the status of 'SW' and perform the following: a. If SW=0: the stepper motor moves clock wise If SW=1: the stepper motor moves counter clock wise	L3	(06)
	c)	Explain with the block diagram the architecture of 8255A	L2	(06)