QUESTION BANK - GUJARAT UNIVERSITY

MICROCONTROLLER AND ITS APPLICATIONS

B.E. Semester - 5 (Inst. & Control)

Each question carries 10 marks

Q-1	With the help of neat diagram explain the architecture of 8051 microcontroller in detail. Discuss its flag register.
Q-2	Draw block diagram of 8 channel temperature indicator and controller using 8051 microcontroller. Explain it in detail.
Q-3	Explain the various addressing modes of 8051 with the help of appropriate example of each.
Q-4	Write an 8051 assembly language program to multiply two 8-bit numbers kept in the external RAM addressed by 4000H and 4001H respectively. Store the result in the external RAM beginning from 6000H.
Q-5	Write an 8051 assembly language program to convert a binary number stored in external RAM location 3000H to its equivalent BCD number and store the result in internal RAM 20H.
Q-6	Ten hexadecimal numbers are stored in internal RAM 40H onwards. Write an 8051 assembly language program to find the largest number and store it in register R4.
Q-7	Explain various bit level instructions available in 8051in detail.
Q-8	(i) Write an 8051 assembly language program to compliment the lower nibble of internal RAM location 72H. (ii) Write an 8051 assembly language program to find larger of two 8-bit numbers stored in external RAM 2000H and 2001H.
Q-9	Explain the difference between MOC, MOVX, and MOVC instructions with the help of neat diagram.
Q-10	Explain all rotate instructions with the help of appropriate example of them.
Q-11	Create a Square wave of 50% duty cycle over Port 0.0.
Q-12	Write an 8051 assembly language program to perform a) keep monitoring the P0.1 until it becomes high b) When P0.1 become high, read data from Port 1, and c) send a low to high pulse on P1.0 indicate that data has been read.
Q-13	(i) Explain the difference between MOV 80H, #99H and MOV @R0, #99H if R0=80H. (ii) If A=90H and CY=1, what is the value of A after execution of (a) RR A (b) RL A (c) RLC A (d) RRC A
Q-14	Describe the interrupt structure of 8051 in detail.

Q-15	(i) Explain the function of the pins PSEN and EA of 8051. (ii) Explain the registers DPTR and SP of 8051.
Q-16	Name any four additional hardware features available in microcontrollers when compared to microprocessors. Explain their use in detail.
Q-17	Explain how interrupts are prioritized in 8051 microcontroller.
Q-18	Explain the I/O port structure of 8051 microcontroller in detail.
Q-19	Explain various timer modes available in 8051 microcontroller in detail.
Q-20	With the help of neat circuit diagram explain how a 4x4 keypad is interfaced with 8051microcontrolle. Write 8051 assembly language program for keypad scanning.
Q-21	Draw the schematic for interfacing a stepper motor with 8051 microcontroller and write 8051 assembly language program for the same.
Q-22	Explain the instruction set of 8051 microcontroller with appropriate example.
Q-23	Explain TCON and TMOD function registers of 8051 microcontroller in detail.
Q-24	Explain SCON and PCON function registers of 8051 microcontroller in detail.
Q-25	Explain the following instructions of 8051 with examples. a. CJNE destination, source, label b. MUL AB c. INC @Rp d. SWAP A e. SETB P2.0
Q-26	Interface 32K of ROM and 8K of RAM with 8051 microcontroller. Write their address range.
Q-27	Explain program status word of 8051 microcontroller in detail.
Q-28	Explain internal memory organization of 8051 microcontroller with the help of necessary figures.
Q-29	Write an 8051 assembly language program to generate software delay of 100ms. Explain your delay calculations assuming crystal frequency of 12MHz.
Q-30	A lookup table of seven segment code is stored in ROM beginning from memory location 5000H. A single digit BCD (i.e. 0 to 9 only) is stored in internal RAM 20H. Convert it to its equivalent seven segment code and store it in external RAM 6000H.
Q-31	Explain different jump and call instructions of 8051 microcontroller with their jump ranges with the help of figure.
Q-32	Write an 8051 assembly language program to find the square of any number between 0 to F using lookup table technique.
Q-33	Interface 4 digit seven segment display with 8051 and write a program to display BCD number 5432 on it.
Q-34	Draw interfacing circuit of LCD with 8051 and write a program to display “HELLO” word on it.

Q-35	Explain pulse width measurement of a square signal using interrupt 1 pin of 8051 microcontroller. Write an assembly language program of the same.
Q-36	Interface 8-bit DAC with microcontroller 8051. Write a program to generate saw tooth wave using DAC.
Q-37	List different modes of data communication available in 8051 microcontroller and discuss any one of them in detail.
Q-38	Explain interrupt driven character transmission in 8051 microcontroller. Write an assembly language program of the same.
Q-39	Explain frequency measurement using 8051 microcontroller. Write an assembly language program of the same.
Q-40	Explain interrupt priority of 8051 microcontroller in detail. How priority can be changed using IP function register?

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