

GUJARAT UNIVERISTY

B.E. 4th SEM EC

Microcontrollers & Applications

Each question carry 10 marks

Q.1 Draw and explain architecture of intel-51, 8-bit Microcontroller.

Q.2 Write a assembly program to multiply two 16-bit numbers for 8051 controller.

Q.3 Write a program to transfer block of data from internal memory locations to external memory locations for 8051 controller.

Q.4 1) A switch is connected to P1.7. Write a program to check the status of switch and perform the following

1. if switch = 0, send letter "N" to P2.

2. if switch = 1, send letter "Y" to P2.

2) Write an assembly language program to convert packed BCD number to ASCII value for 8051 controller.

Q.5 Explain different Addressing Modes of 8051 Microcontroller with examples.

Q.6 Explain pin configuration with circuit diagram for all port of 8051 microcontroller.

Q.7 a) Answer the following questions

[1] What is the purpose of EA pin in 8051 Microcontroller.

[2] What is the function of ALE signal?

[3] Describe DPTR.

[4] Write instruction to select register bank 2.

[5] Draw clock circuit of 8051 microcontroller.

b) Explain following instructions.

[1] XCHD A, R1 [2] MOVC A,@A+DPTR

[3] MOV A, 50H [4] MOV R7,#50H [5] MOV 50H ,#50H

Q. 8 Explain different modes of Timer for 8051 microcontroller.

Q. 9 Explain difference between Microprocessor and Microcontroller. Also list different

criteria for selection of a microcontroller for a particular application.

Q.10 List main feature of 8051 microcontroller. Give difference between 8051 and 8052 microcontroller. Also discuss RAM structure of 8051 microcontroller.

Q.11 List the interrupts available in the 8051 microcontroller. Explain interrupt enable (IE) SFR and Interrupt priority (IP) SFR.

Q.12 Explain TCON and TMOD SFR for 8051 Microcontroller.

Q.13 Explain different mode for serial communication for 8051 Microcontroller.

Q.14 a) Define and describe the directives of 8051 Microcontroller.

b) Explain classification of instruction used for 8051 microcontroller.

Q.15 a) Explain following instructions
[1] SWAP A [2] MOVX A,@DPTR [3] DIV AB
[4] MUL AB [5] RR A

b) Answer the following questions

[1] List all SFR used for 8051 microcontroller.

[2] Describe PC.

[3] What is the function of \overline{PSEN} signal?

[4] Draw Reset circuit of 8051 microcontroller.

[5] Explain function of MOV R1,35h

Q.16 Explain operation of timer in mode 1. Discuss programming steps to generate time delay using mode 1. Write program to generate delay of 1 second using timer 0 in mode 1.

Q. 17 Discuss interfacing of external 16K EPROM and 8K RAM with the microcontroller.

Q.18 Write program to transfer the message “Gujarat University” serially at 4800 baud, 8-bit data, 1 stop bit.

Q.19 How Liquid Crystal Display (LCD) is superior to conventional Display? List and describe the LCD Instructions.

Q.20 Draw and explain interfacing diagram of DAC with 8051 microcontroller. Write program to generate sine wave at the output of DAC.

- Q.21 Draw and explain interfacing of 4x4 matrix keyboard with 8051 microcontroller. Write program to read switch.
- Q.22 Explain interfacing of stepper motor with microcontroller. Write program to rotate stepper motor in clockwise direction continuously in full step mode.
- Q.23 Discuss RTC interfacing with microcontroller. Write program to get values of hour, minute and second from RTC to RAM location 40h,41h and 42h respectively.
- Q.24 Draw and explain interfacing diagram of ADC with 8051 microcontroller.
- Q.25 Draw and explain Interfacing of 32K bytes of external RAM and 4K bytes of ROM with 8051 microcontroller.
- Q.26 1) Write a program to perform the following.
1. Keep monitoring P1.2 until it becomes high.
 2. When P1.2 becomes high write value 45H on P0.
 3. Sent a high to low pulse to P2.3.
- 2) Write an assembly language program to convert two ASCII value to packed BCD number for 8051 controller.
- Q.27 Draw and explain time/counter logic diagram for 8051 microcontroller. Write a program to generate square wave of frequency 1Kz on pin 1.2
- Q.28 Draw and explain mode 2 for timer of 8051 controller. Write a program to generate square wave of frequency 5Kz on pin 1.4.
- Q.29 Write a program to generate frequency of 100Kz on pin 2.3. Use timer 1 in mode 1.
- Q.30 Draw and explain Interfacing of 1K bytes of external RAM and 8K bytes of ROM with 8051 microcontroller.
- Q.31 Write a program to send the text string "hello" to serial port 1. Set the baud rate at 9600, 8 bit data, and 1 stop bit.
- Q.32 Give comparison between ISA, EISA and VESA bus.
- Q.33 Explain in brief
- 1) PCI Bus
 - 2) USB
- Q.34 Explain in brief
- 1) Parallel Printer Interface
 - 2) Accelerated Graphics Port

- Q 35 Draw and explain interfacing diagram of stepper motor with 8051 microcontroller.
- Q. 36 a) Write an 8051 program count number of 1's in data stored in 50 h memory location.
b) Write an 8051 program to add 16 bit data stored in external memory location starting from 5000H to 5003H. Store answer at external memory location 6000 and 6001H.
- Q. 37 a) Write an ALP to sort block of ten data stored in external memory location from 4000h in ascending order.
b) Write an 8051 program count number of 0's in data stored in 60 h memory location.
- Q. 38 Write and explain bit format for SCON and PCON SFR for 8051 Microcontroller.
- Q.39 a) Write a program to transfer the message "YES" serially do this continuously.
b) Write an 8051 program to generate 5 KHz pulse waveform of 50% duty cycle on pin 1.0 using timer-1 in mode-2.
- Q. 40 Draw and explain interfacing of LCD with 8051 controller. Write a program to display "EC Department" on LDC