



MICROPROCESSOR AND MICROCONTROLLERS

QUESTION BANK

with ANSWER KEY for 2mark Qs

UNIT 1

PART A

1. What is the need for ALE signal in 8085 microprocessor? (2)

The ALE signal goes high at the beginning of each machine cycle indicating the availability of the address on the address bus, and the signal is used to latch the 16-bit address bus.

2. How many machine cycles are needed to execute STA 1800H? (2)

4 Machine cycles are needed.

3. What is the need for interfacing? (2)

Generally I/O devices are slow devices. Therefore the speed of I/O devices does not match with the speed of microprocessor. And to an interface is provided between system bus and I/O devices.

4. Compare memory mapped I/O and peripheral mapped I/O. (2)

Instead of a memory register, if an output device is connected at the address, the accumulator contents will be transferred to the output device. This is called memory mapped I/O.

5. State the disadvantages of memory mapped I/O scheme. (2)

When I/O devices are memory mapped, some of the addresses are

allotted to I/O devices and so the full address space cannot be used for addressing memory (i.e., physical memory address space will be reduced. Hence memory mapping is useful only for small systems, where the memory requirement is less.

6. What are the requirements to be met while interfacing I/O devices to microprocessor/microcontroller? (2)



Use IO/M signal

IO device selection Handshaking signals

7. Define interfacing. (2)

Generally I/O devices are slow devices. Therefore the speed of I/O devices does not match with the speed of microprocessor. And so an interface is provided between system bus and I/O devices.

8. Show the common anode seven segments LED Configuration. How to switch it on and off? (2)

In common anode, all anodes of LEDs are connected together.

9. Differentiate between software and hardware interrupts. (2)

The Software interrupt is initiated by the main program, but the Hardware interrupt is initiated by an external device. In 8085, the Software interrupt cannot be disabled or masked but the Hardware interrupt except TRAP can be disabled or masked.

10. What is interrupt? (2)

Interrupt is a signal sent by an external device to the processor so as to request the processor to perform a particular task or work.

11. Name the vectored and non vectored interrupt of 8085 system. (2)

When an interrupt is accepted, if the processor control branches to a specific address defined by the manufacturer then the interrupt is called vectored interrupt.

In Non-vectored interrupt there is no specific address for storing the interrupt service routine. Hence the interrupted device should give the address of the interrupt service routine.

12. What do you mean by timing diagram? (2)



The timing diagram provides information regarding the status of various signals, when a machine cycle is executed. The knowledge of timing diagram is essential for system designer to select matched peripheral devices like memories, latches, ports, etc., to form a

microprocessor system.

13. Define i) Instruction cycle (1)

The sequence of operations that a processor has to carry out while executing the instruction is called Instruction cycle. Each instruction cycle of a processor in 8085 consists of a number of machine cycles.

ii) Machine cycle (1)

The processor cycle or machine cycle is the basic operation performed by the processor. To execute an instruction, the processor will run one or more machine cycles in a particular order.

14. Define T-state and In which T-cycle the ALE signal is activated?(2)

T-State is defined as one subdivision of the operation performed in one clock period. These subdivisions are internal states synchronized with the system clock, and each T-State is precisely equal to one clock period. At the beginning of first T state.

15. What do you mean by masking the interrupt? How it is activated in 8085? (2)

Masking is preventing the interrupt from disturbing the current program execution. When the processor is performing an important job (process) and if the process should not be

interrupted then all the interrupts should be masked or disabled. In processor with multiple interrupts, the lower priority interrupt can be masked so as to prevent it from interrupting, the execution of interrupt service routine of higher priority interrupt.

16. List the main applications of 8 bit microprocessors?(2)

LCD

Microcomputer

Keyboard display.

17. What is Address Bus?(2)



The address is an identification number used by the microprocessor to identify or access a memory location or I/O device. It is an output signal from the processor. Hence the address bus is unidirectional.

18. What is System Bus?(2)

Bus is a group of conducting lines that carries data, address and control

Signals.

19. What are the limitations of 8085 MPU?(2)

(i) The lower order address bus of the 8085 microprocessor is multiplexed (time shared) with the data bus. The buses need to be demultiplexed.

(ii) Appropriate control signals need to be generated to interface memory and I/O with the 8085.

20. Why is the data bus bi-directional?

The microprocessor has to fetch (read) the data from memory or input device for processing and after processing, it has to store (write) the data to memory or output device. Hence the data bus is bi-directional.

21. What is a flag?(1)

The data conditions, after arithmetic or logical operations, are indicated by setting or resetting the flip-flops called flags.

22. Why are the program counter and the stack pointer 16-bit registers?(2)

Memory locations for the program counter and stack pointer have 16-bit addresses. So the PC and SP have 16-bit registers.

23. Explain the function of ALE and IO/M signals in the 8085 architecture?(2)

The ALE signal goes high at the beginning of each machine cycle indicating the availability of the address on the address bus, and the signal is used to latch the low order address bus. The IO/M signal is a status signal indicating whether the machine cycle is I/O or memory operation. The



IO/M signal is combined with the RD and WR control signals to generate IOR, IOW, MEMW, MEMR .

24. Write down the control and status signals?(2)

Two Control signals and three status signals

Control signals: RD and WR

Status signals: IO/M, S1, S2

25. Define T-state?(2)

T-state is defined as one subdivision of the operation of performance in one clock period.

PART B

1. Describe the functional pin diagram of 8085. (16)
2. Describe the functional block diagram of 8085. (16)
3. Explain the 8085 interrupt system, in detail. (16)
4. Explain various machine cycles supported by 8085. (16)
5. a) With suitable examples explain how I/O devices are connected using memory mapped I/O and peripheral I/O. (10)
b) Design a microprocessor system to interface an $8K \times 8$ EPROM and $8K \times 8$ RAM. (6)
6. Draw timing diagrams for the following instruction with appropriate control and status signal. Explain in brief. CALL 2000 (16)
7. Describe the 8085 microcomputer with an example?(16)
8. Explain the Internal architecture of the 8085 microprocessor?(16)
9. Describe the concepts of memory interfacing?(16)
10. Draw and explain the timing diagram of the following instructions.(16)
 - (i) LDA 2050H
 - (ii) RET



UNIT 2

PART A

1. Show the different instruction formats used in 8085. (2)

- (i) One byte instruction
- (ii) Two byte instruction
- (iii) Three byte instruction

2. What is the type of stack used in 8085? (2)

First in First out

3. What are the different addressing modes of 8085? (2)

- (i) Direct
- (ii) Indirect
- (iii) Immediate
- (iv) Implied
- (v) Register

4. Define addressing modes. How many addressing modes are available in 8085?(2)

The different ways that a microprocessor can access data are referred to as addressing modes. 5 addressing modes are available in 8085.

5. The last executable instruction in a procedure must beHLT..... (2)

6. Explain the following instruction:

- i) LHLD 8020 (1)



This instruction copies the contents of the memory location given within the instruction into the L reg and the contents of the next memory location into the H reg.

ii) XTHL (1)

This instruction exchanges the contents of the memory location pointed by the with the contents of the L Reg and the contents of the next memory location into the H reg.

7. What do you mean by Looping, Counting and Indexing? (2)

looping: In this tech the program is instructed to execute certain set of instructions repeatedly to execute a particular task number of times.

Counting: This tech allows programmer to count how many times the ins. or instruction are executed.

Indexing: This tech allows programmer to point or refer the data stored in sequential memory location one by one.

8. What is the subroutine? How it is useful? (2)

When interrupt line is high, the microprocessor executes the current operation and goes to the specific vector location.

9. Explain the need of software timers. (2)

A timer can be used to control the sequence of an event or process.

10. If the CALL and RET instructions are not provided in the 8085, could it be possible to write subroutines for this microprocessor? If so how will you call and return from the

subroutine? (2)

JMP instruction

11. Differentiate cascade stack and memory stack? (2)

cascade stack- *stack* to store the return address

memory stack- meaning that only 1 MB of *memory* can be addressed



12. What is the significance of 'XCHG' and 'SPHL' instructions? (2)

'XCHG'-Exchange the contents of HL register pair

SPHL-store the contents of HL register pair

13. Define two-byte instruction with one example?(2)

In a 2-byte instruction, the first byte specifies the Opcode; the second byte specifies the operand.

Example: Opcode operand binary code hex code

MVI A, Data 0011 1110 3E First byte

DATA Data second byte

14. Write instructions to load the hexadecimal numbers 65H in register C, and 92h in the accumulator A. Display the number 65H at PORT0 and 92H at PORT1? (2)

MVI C, 65H

MVI A, 92H

OUT PORT1 ; DISPLAY 92H

MOV A, C ; COPY C INTO A FOR DISPLAY

OUT PORT0 ; DISPLAY 65H

HLT

15. What operation can be performed by using the instruction ADD A? (2)

The instruction ADD a will add the content of the accumulator to itself; this is equivalent to multiplying by 2.

16. What are the machine control operations used in 8085 microprocessor? (2)

HLT: Halt

NOP: No Operation



17. What are the notations used in the 8085 instructions? (2)

R = 8085 8-bit register

M=memory register

Rs = Register source

Rd = register destination

Rp = register pair

() = Contents of

18. What is JNC 16-bit address? (2)

It change the program sequence to the location specified by the 16-bit address if the carry flag is reset .

19. Give the difference between JZ and JNZ. (2)

JZ change the program sequence to the location specified by the 16-bit address if the zero flag is set

JNZ change the program sequence to the location specified by the 16-bit address if the zero flag is reset.

20. What is CMA? (2)

Complements the data in the accumulator.

21. What is CALL instruction? (2)

CALL instruction change the sequence to the location of a subroutine.

22. What is a three-byte instruction? (2)



In a 3-byte instruction, the first byte specifies the Opcode; the second byte and third byte specifies the operand.

Example: STA

23. What operation can be performed by using the instruction SUB A? Specify the status of Z and CY? (2)

The instruction SUB A will clear the accumulator. The flag status will be $CY = 0$ and $Z = 1$.

24. Define Opcode and operand? (2)

The operation to be performed is called Opcode. The data to be operated is called operand.

25. Define the types of branching operations?

Jump: to test the conditions

Call, Return, And Restart: Change the sequence of the program

PART B

1. Explain the addressing modes of 8085 with example. (16)

2. Explain the Different types of instruction in 8085. (16)

3. i) Write a program to arrange /n numbers in ascending order. (8)

ii) Write a program to unpack a two digit BCD number stored at memory location

1000H. (8)

4. Explain the BCD to Decimal code conversion technique and write 8085 assembly

language program for the same. (16)

5. Explain the BCD to Seven Segment code conversion technique and write 8085 assembly language program for the same. (16)

6. i) Write a program to calculate the factorial of a number between 0 to 8. (8)

ii) Write a program to find the number of negative, zero and positive numbers. (8)



7. Write an assembly language program to subtract a BCD number from another BCD number? (16)

8. Explain the 8085 instruction set? (16)

9. Write an assembly language program to add two 16-bit numbers? (16)

10. Describe the concept of Instructions and data format? (16)

UNIT 3

PART A

1. Write down the function of OBF in 8255. (2)

output Buffer Full function determines whether the bidirectional data transfer is allowed or not.

2. Define PPI. (2)

The 8255A is a widely used, programmable, parallel I/O device. It can be

programmed to transfer data under various conditions, from simple I/O to interrupt I/O.

3. Bring about the features of 8259. (2)

1. It manages eight interrupt requests.
2. The interrupt vector addresses are programmable.
3. The priorities of interrupts are programmable.
4. The interrupt can be masked or unmasked individually.

4. Explain the advantages of PIC chips in microprocessor based systems. (2)

To increase the interrupt handling capacity of the microprocessor.

5. Explain the working of receiver part of USART. (2)

it manages all receiver related activities. Along with data reception, it does false start bit detection, parity error detection, framing error detection, sync detection and break detection.



6. What is key debouncing? (2)

Key bouncing may cause multiple entries made for the same key. To overcome this problem after a key press is sensed the device is made to wait for few milliseconds. Then the key is checked again to ensure it is still pressed. If it is still pressed it is taken as a valid key press. This process is called keyboard debouncing.

7. How much current is needed to drive an LED? Draw a typical driver circuit for it? (2)

A current of between 5 and 30mA to light.

8. What is the count value needed to program the 8254 to generate a delay of 1 ms?(2)

Count-1000, frequency-1khz

9. Draw and explain the operation of a sample and hold circuit. (2)

10. Name any two type of ADCS. (2)

The different types of ADC are successive approximation ADC,

Counter type ADC flash type ADC, integrator converters and voltage-to-frequency converters.

11. For a A/D converter circuit why Vref should be stabilized supply.(2)

To regulate the supply.

12. Which is the fastest ADC and why? (2)

Flash type ADC.

13. What do you mean by Quantization error? (2)

The difference between an analog wave and its digital representation. Also known as "quantization noise."



14. What is the difference between A/D and D/A converters? (2)

Digital-to-analog conversion is to pull the samples from memory and convert them into an *impulse train*.

An ADC is attempting to capture and convert a largely unknown signal into a known representation. In contrast, a DAC is taking a fully known, well-understood representation and "simply" generating an equivalent analog value.

the challenge for an ADC is much greater than it is for a DAC. To get the most out of an ADC, especially a higher-performance one (speed or precision) takes a well-designed analog signal-conditioning input channel, often with an ADC driver carefully matched to the ADC itself.

The DAC's life is much easier. But that relative ease shouldn't encourage complacency on the designer's part. It's too easy not to give the analog output of the DAC the attention it needs, regarding parameters such as slew rate, output drive (voltage, current, and impedance) and protection against faults at its load. And that can lead to nasty circuit and system level headaches, at both the prototype evaluation and in the field. ♦

15. Define the following terms for D/A converters: (2)

i) Resolution

Resolution of a converter determines the degree of accuracy in conversion. It is equal to $1/2^n$.

ii) Accuracy

Accuracy is the degree to which information on a map or in a digital database matches true or accepted values. Accuracy is an issue pertaining to the quality of data and the number of errors contained in a dataset or map. In discussing a GIS database, it is possible to consider horizontal and vertical accuracy with respect to geographic position, as well as attribute, conceptual, and logical accuracy.

iii) Monotonicity

If a clock has monotonicity, then each successive time reading from that clock will yield a time no later in the future than the previous reading.

iv) Conversion time

The time required by an analog to digital converter to fully convert an analog input sample.

16. What is the necessity of the programmable interval timer? (2)

To generate the accurate time delay.



17. List the features of 8279. (2)

It has built in hardware to provide key debounce.

It provides two output modes for display interface.

It provides three input modes for keyboard interface.

18. Compare parallel and serial type of data transfer. (2)

In parallel communication number of lines required to transfer data depend on the number of bits to be transferred.

In serial communication one bit is transferred at a time over a single line.

19. Why the number of output ports in the peripheral-mapped I/O is restricted to 256 ports? (2)

The number of output ports in the peripheral I/O is restricted to 256 ports because the operand of the OUT instruction is 8-bits; it can have only 256 combinations.

19. What are the control signals necessary in the memory mapped I/O? (2)

MEMR, MEMW

20. What happens when the 8085 executes the out instruction? (2)

When the 8085 executes the out instruction, in the third machine cycle, it places

the output port address on the low-order address bus, duplicates the same port address on the high-order bus, places the contents of the accumulator on the data bus and asserts the control signal WR.

21. Define Memory mapped I/O? (2)

In this method, an I/O device is treated as a memory location. The microprocessor uses 16-bit address to identify an I/O device. Thus the memory map is shared between memory and I/O devices.

22. What is an interrupt I/O? (2)



Interrupt is an event that causes the CPU to initiate a fixed sequence known as an interrupt sequence.

23. What is SIM? (2)

Set interrupt mask-SIM

24. What is RIM? (2)

Read interrupt mask=RIM

25. Give the commonly used priority modes? (2)

fully nested mode

special fully nested mode

rotating priority mode

special masked mode

polled mode

PART B

1. Explain any two of the modes of 8255 in detail. (16)

2. With neat block diagram explain PPI. (16)

3. i) Using model, write a program to communicate between two microprocessors using 8255. (10)

ii) Show the control word format of 8255 and explain how each bit is programmed. (6)

4. With neat block diagram explain the functions of 8259. (16)

5. i) Bring about the features of 8251. (6)

ii) Discuss how 8251 is used for serial communication of data. (6)

iii) Explain the advantages of using the USART chips in microprocessor based systems. (4)



6. Design an interface circuit needed to connect DIP switch as an input device and display the value of the key pressed using a 7 segment LED display. Using 8085 system, write a program to implement the same. (16)
7. Explain the 7 segment LED interface with microprocessor. (16)
8. i) Explain the advantages of using the keyboard and display controller chips in microprocessor based system. (6)
ii) Write a program using RST 5.5 interrupt to get an input from keyboard and display it on the display system. (6)
iii) Use RST 5.5 instead of RST 7.5 and change mask pattern accordingly. (4)
9. i) Explain the working of 8254 timer and write a program using it to generate a square waveform of period 3 msec. (10)
ii) Describe with any one of the mode configurations of 8254 timer in detail. (6)
10. Explain how to convert an analog signal into digital signal. (16)

UNIT 4

PART A

1. What is Microcontroller? (2)

A device which combines the microprocessor with integrated peripherals like memory, serial ports, parallel ports, timer/counter, interrupt controller, data acquisition interfaces like ADC, DAC is called microcontroller.

2. List the features of 8051 microcontroller. (2)

The features are

single_supply +5 volt operation using HMOS technology.

4096 bytes program memory on chip(not on 8031)

128 data memory on chip.

Four register banks.

Two multiple mode,16-bit timer/counter.



Extensive boolean processing capabilities.

64 KB external RAM size

3. Name any four additional hardware features available in microcontrollers when compared to microprocessors. (2)

Two multiple mode, 16 bit timers/counters, Four register banks, integrated Boolean processor.

4. List out the Hardware Resources available in 8051. (2)

4096 bytes on chip program memory

128 bytes onchip data memory on chip

5. When 8051 is reset, all interrupts are disabled. How to enable these interrupts?(2)

INTR must be kept low & ISR should be enable.

6. What is nested interrupts? (2)

When the interrupt is acknowledged, it sets the corresponding bit in ISR.

7. How will you double the baud rate in 8051? (2)

By adjusting the machine cycles.

8. Explain software and hardware methods to start and stop timers in 8051.(2)

When a timer is used to measure time it is also called an "interval timer" since it is measuring the time of the interval between two events.

9. Give steps to program 8051 for serial data transfer. (2)

IN

OUT



DATA

JMP

HLT

10. Write short notes on interrupt priority. (2)

ISR-Interrupt service routine stores all the levels that are currently being serviced.

11. Write the vector address and priority sequence of 8051 interrupts (2)

The interrupts are:

Vector address

External interrupt 0 : IE0 : 0003H

Timer interrupt 0 : TF0 : 000BH

External interrupt 1 : IE1 : 0013H

Timer Interrupt 1 : TF1 : 001BH

Serial Interrupt

Receive interrupt : RI : 0023H

Transmit interrupt: TI : 0023H

12. Write a delay routine for 1 millisecond using timer 0 of 8051 for 12 MHz crystal frequency. (2)

13. What is the purpose for the 8255 PPI? (2)

The 8255A is a widely used, programmable, parallel I/O device. It can be

programmed to transfer data under various conditions, from simple I/O to interrupt I/O.

14. List the operating modes of 8255A PPI? (2)



Two 8-bit ports (A and B)

Two 4-bit ports (Cu and CL)

Data bus buffer

Control logic

15. Specify the bit of a control word for the 8255, which differentiates between the I/O mode and the BSR mode? (2)

BSR mode D7= 0, and I/O mode D5 = 1

16. Write the control word format in the BSR mode? (2)

D7 D6 D5 D4 D3 D2 D1 D0

0 X X X Bit Select S/R

BSR mode Not used Set = 1

Generally Set= 0 Reset = 0

17. List the major components of 8279 keyboard /display interface? (2)

Keyboard section

Scan section

Display section

MPU interface

18. What is USART? (2)

USART is an integrated circuit. It is a programmable device ;its function

and specifications for serial I/O can be determined by writing instructions in its

internal registers.



19. List the major components of 8251A programmable communication interface? (2)

Read/Write control logic

• Three buffer registers

• Data register

• Control register transmission receiver

• Data bus buffer

• Modem control

20. What is the purpose for scan section in Keyboard interface? (2)

The scan section has a scan counter and four scan lines. These scan lines can be decoded using a 4-to-16 decoder to generate 16 lines for scanning

21. What is the need of Coprocessor? (2)

The general-purpose processors such as 8086 and 8085 are not optimized to do arithmetic manipulations, CRT display manipulation and word processing. Hence we go for a coprocessor, which is capable of doing dedicated functions (Special Operations) to increase the overall execution speed of larger systems.

22. What is transmitter section in USART? (2)

The transmitter section accepts parallel data from the MPU and converts

them into serial data. It has two registers. A buffer register and an output register

23. Give the various modes of 8253 timer? (2)

Mode 0: interrupt or terminal count

Mode 1: Rate generator

Mode 3: square wave generator

Mode 4: software triggered strobe

Mode 5: hardware triggered strobe



24. Write the steps necessary to initialize a counter in write operations? (2)

Write a control word into the control register

Load the low-order address byte

Load the high order byte

25. List the major components of 8251A programmable communication interface? (2)

Read/Write control logic

Three buffer registers

Data register

Control register transmission receiver

Data bus buffer

Modem control

PART B

1. Describe the architecture of 8051 with neat diagram. (16)

2. Discuss the peripheral interface of 8051. (8)

3. Explain the different serial communication modes in 8051. (8)

i. Explain the memory structure of 8051. (8)

ii. States various modes available for timer in 8051. (16)

5. Explain the functional pin diagram of 8051 Microcontroller. (16)

6 Explain in detail about the coprocessor (16)

7.Explain the timer &counter application of 8051?(16)

8.Draw the functional block diagram of 8051?(16)

9.Explain the different modes of operation timer in8051?(16)



10. Explain the interrupt structure of 8051 microcontroller Explain how interrupts are prioritized. (8)

11.(i) What is the difference between the Microprocessors and Microcontrollers?(8)

(ii) Explain the I/O port structure of 8051. (8)

UNIT 5

PART A

1. What is the time taken to execute MUL instruction in 8051? (2)

2. What is the jump range? (2)

There are three forms of jump. They are

LJMP(Long jump)-address 16

AJMP(Absolute Jump)-address 11

SJMP(Short Jump)-relative address

3. Explain the addressing modes of 8051. (2)

(i)register addressing

(ii)Direct byte addressing

(iii)Register indirect addressing

(iv)Immediate addressing

(v)register specific addressing

(vi)Index addressing

4. Identify the addressing mode used by each of the following instruction.

i) MOV A, R4

register addressing



ii) `MOVC A, @A+DPTR`

Index addressing

iii) `SWAP A`

register specific addressing

iv) `MOV A, #30H`

Immediate addressing

5. Explain PUSH and POP instructions in 8051. (2)

PUSH-The stack pointer is incremented by one. The contents of the indicated variable is then copied into the internal RAM location addressed by the stack pointer.

POP-Reverse of PUSH operation

6. What are the instructions used to access external RAM. (2)

`MOVC A, @A+DPTR`

`MOVC A, @A+PC`

7. What is key bounce? How it is achieved? (2)

Mechanical switches are used as keys in most of the keyboards.

When a key is pressed the contacts bounce back and forth and settle down

only after a small time delay (about 20 ms). Even though a key is

actuated once, it will appear to have been actuated several times. This

problem is called key bouncing

8. Explain DAA instruction of 8051. (2)

decimal adjust accumulator for addition bytes

9. Explain rotate instructions of 8051. (2)



RL A,ELC A,RR A,RRC A

10. Give the PSW setting for masking register bank 2 as default register bank in 8051

Microcontroller? (2)

Selecting one of the 4 banks is done by setting or clearing the 2 bank select bits RB0 and RB1 in the PSW register. Registers are called R0 to R7 by default

11. How can you perform multiplication in 8051? (2)

MUL AB multiplies the unsigned eight bit integers in the Accumulator and REG B. The low order byte of the 16 Bit product is left in the accumulator, and the high order byte in B.

12. If the product is 12. How can you perform addition in 8051? (2)

MOV A,#30H

ADD A,#50H

13. Name any four bit manipulation instructions in 8051? (2)

ANL A,ORL A,XRL A,CLR A

14. Write a program to subtract the contents of R1 of Bank 0 from the contents of R0 of Bank 2 using 8051? (2)

MOV PSW,#10

MOV A,R0

MOV PSW,#00

SUBB A,R1

15. Write a program to subtract 2 8-bit numbers & exchange the digits using 8051? (2)

MOV A,#9F



MOV R0,#40

SUBB A,R0

SWAP A

16. Write a program to swap two numbers using 8051? (2)

MOV A, #data

SWAP A

17. Write a program to add 2 8-bit numbers using 8051? (2)

MOV A,#30H

ADD A,#50H

18. Write a program to find the 2's complement using 8051? (2)

MOV A,R0

CPL A

INC A

19. Write program to load accumulator ,DPH,&DPL using 8051? (2)

MOV A,#30

MOV DPH,A

MOV DPL,A

20. Write about the jump statement? (2)

There are three forms of jump. They are

LJMP(Long jump)-address 16

AJMP(Absolute Jump)-address 11



SJMP(Short Jump)-relative address

21. Write about CALL statement in 8051? (2)

There are two subroutine CALL instructions. They are

LCALL(Long CALL)

ACALL(Absolute CALL)

Each increments the PC to the 1st byte of the instruction & pushes them in to the stack

22. List the addressing modes of 8051? (2)

Direct addressing

Register addressing

Register indirect addressing.

Implicit addressing

Immediate addressing

Index addressing

Bit addressing

23. Write a program to mask the 0th &7th bit using 8051? (2)

```
MOV A,#data
```

```
ANL A,#81
```

```
MOV DPTR,#4500
```

```
MOVX @DPTR,A
```

```
LOOP SJMP LOOP
```

24. Write A program to perform multiplication of 2 nos using 8051? (2)



MOV A,#data 1

MOV B,#data 2

MUL AB

MOV DPTR,#5000

MOV @DPTR,A(lower value)

INC DPTR

MOV A,B

MOVX @ DPTR,A

25. Explain the interrupts of 8051 microcontroller? (2)

INT0,TF0,INT1,TF1,R1&T1

PART B

1. i) Write 8051 ALP to read data from port 1 when negative edge triggered at INTO and supply the data to port 2 by masking the upper 4 bits. (8)

ii) Write 8051 ALP to transmit 'Hello World' to PC at 9600 baud for external crystal frequency of 11.0592MHz. (8)

2. With a neat circuit diagram explain how a 4 x 4 keypad is interfaced with 8051 microcontroller and write 8051 ALP for keypad scanning. (16)

3. Draw the schematic for interfacing a stepper motor with 8051 microcontroller and write 8051 ALP for changing speed and direction of motor. (16)

4. Draw the schematic for interfacing a servo motor with 8051 microcontroller and write 8051 ALP for servo motor control. (16)

5. i) Explain addition and subtraction instructions of 8051. (8)

ii) Explain various types of jump instructions according to range. (8)

6. i) Write a 8051 ALP to find Fibonacci series of N given numbers. (8)

ii) Write a 8051 ALP to find the average of given N numbers.



7. List the various Instruction available in 8051 microcontroller.(16)
8. Draw the Pin Diagram of 8051 and explain the function of various signals.(16)
- 9.Explain the microcontroller 8051 based stepper motor control?(16)
10. Explain the microcontroller 8051 based stepper motor control?(16)
11. Explain the microcontroller 8051 based Closed loop control of servo motor(16)
- 12.Explain the 4x4 interfacing with microcontroller 8051?(16)

www.eeecube.blogspot.com