UNIT-1   8085 MICROPROCESSOR

TWO MARKS

1. What is microprocessor? Give the power supply &clock freqency of 8085

A microprocessor is a multipurpose, programmable logic device that reads binary instructions from a storage device called memory accepts binary data. As input and processes data according to those instructions and provides result as output. The power of 8085 is +5v and clock freqency in 3MHZ.

2. List few applications of microprocessor-based system.

It is used:

i)For measurements, display and control of current, voltage, Temperature, pressure, etc. ii)For traffic control and industrial tool control.
iii)For speed control of machines.

3.   What are the funtions of an accumalator?

The accumalator is the register associated with the ALU operations and sometimes I/O operations. It is an integral part of ALU. It holds one of data to be processed by ALU. It also temporarily stores the result of the operation performed by the ALU.

4.   List the 16 – bit registers of 8085 microprossor.

Stack pointer (sp) and program counter(pc).

5.   List the allowed register pairs of 8085.

B-C register pair   D-C register pair   H-L register pair.

6.   Mention the purpose of SID and SOD lines

SID(serial input data line):

It is an input line through which the microprocessor accepts serial data. SOD(serial output data line):
It is an output line through which the microprocessor sends output serial data.

7.   What is an opcode?

The part of the instruction that specifies the operation to be performed is called the operation code or opcode.

8.What is the funtion of IO/M signal in the 8085?

It is a status signal. It is used to differentiate between memory locations and I/O operations when this signal is low (IO/M=0) it denotes the memory related operations.when this signal is high(IO/M=1)it denotes an I/O operation

9. What is an operand?

The data on which the operation is to be performed is called as an operand.

10. How many address lines in a 4096*8 EPROM CHIP?

12 Address lines.

11.Control signals used for DMA operation are

HOLD and HLDA

12. What is meant by wait state?

This state is used by slow peripheral devices.the peripheral devices can transfer the data to or from the microprocessor by using READY input line.the microprocessor remains in the wait state as long as READY line is low.during the wait state,the contents of the address,address/data and control buses are held constant.

13. What is meant by polling?

Polling or device polling is a process which identifies the device that has interrupted the microprocessor.

14. What is meant by interrupt?

Interrupt is an external signal that causes a microprocessor to jump to a specific subroutine.

15. Explain priority interrupts of 8085?

The 8085 microprocessor has five interrupt inputs.they are TRAP,RST 7.5,RST 6.5,RST 5.5,and INTR.these interrupts have a fixed priority of interrupt service.If two or more interrupts go high at the same time,the 8085 will service them on priority basis.the TRAP has the highest priority followed by RST7.5,RST6.5,RST5.5.the priority of interrupts in 8085 is shown in the table.

Interrupts	priority
TRAP	1
RST7.5	2
RST6.5	3
RST5.5	4
INTR	5

16. What is a microcomputer?

A computer that is designed using a microprocessor as its CPU is called microcomputer.

17. What is the signal classification of 8085?

All the signals of 8085 can be classified into 6 groups
1. Address bus   2. Data bus
3. Control and status signals   4. Power supply and frequency signals
5. Externally intiated signals 6. Serial I/O ports

18. What are operations performed on data in 8085?

The various operations performed are

1. Store 8-bit data 2. Perform arithmetic and logical operations 3. Test for conditions 4. Sequence the execution of instructions
5. Store data temporarily during execution in the defined R/W
6. Memory locations called the stack

19. Steps involved to fetch a byte in 8085?

i)the pc places the 16-bit memory address on the address bus

ii)the control unit sends the control signal RD to enable the memory chip iii)the byte from the memory location is placed on the data bus

iv)the byte is placed in the instruction decoder of the microprocessor and the task is carried out according to the instruction.

20. How many interrupts does 8085 have mention them

The 8085 has 5 interrupt signals they have INTR,RST7.5,RST6.5,RST5.5 and TRAP

21. Basic concepts in the memory interfacing?

The primary function of memory interfacing is that the microprocessor should be able to read from and write into a given register of a memory chip.to perform these operations the

microprocessor should,

1. Be able to select the chip   2. Identify the register   3. Enable the appropriate buffer

22. Define instruction cycle,machine cycle and T-state?

Instruction cycle is defined as the time required completing the execution of an instruction.

Machine cycle is defined as the time required completing one operation of accessing memory,I/O or acknowledging an external request.T –cycle is defined as one subdivision of the operation performed in one clock period.

23. What is the use of ALE?

The ALE is used to latch the lower order address so that it can be available in T2 and T3 and used for identifying the memory address.during T1 the ALE goes high,the latch is transparent ie, the output changes according to the input data,so the output of the latch is the lower order address.when ALE goes low,the lower order address is latched until the next ALE.

24. How many machine cycles does 8085 have,mention them?

The 8085 have seven machine cycles they are
1. Opcode fetch
2. Memory read
3. Memory write
4. I/O read
5. I/Owrite
6. Interrupt acknowledge
7. Bus idle

25.Explain the signals HOLD,READY and SID

HOLD indicates that a peripheral such a DMA controller is requesting the use of address bus,data bus and control bus.

READY is used to delay the microprocessor read or write cycles until a slow responding peripheral is ready to accept or send data.
SID is used to accept serial data bit by bit.

26.What is the use of bidirectional buffer?

It is used to increase the driving capacityof data bus.the data bus of the microcomputer system is bidirectional,so it requires a buffer that allow the data to flow in both directions.

27.What is the microcontroller and microcomputer?

Microcontroller is a device that includes microprocessor,memory and I/O signal lines on a single chip,fabricated using VLSI technology.

Microcomputer is a computer that is designed using microprocessor as its CPU.it includes microprocessor,memory and I/O.

28.Define flags?

The flags are used to reflect the data conditions in the accumulator.the 8085 flags are s-sign flag,zero flag,auxillary flag,parity flag,CY-CARRY FLAG

D7	D6	D5	D4	D3	D2	D1	D0
S	Z		AC		P		CY

29. Difference between memory mapped I/O and peripheral I/O ?

MEMORY MAPPEED I/O	PERIPHERAL I/O
16-bit device address	8-bit device address
The data transfer between any general-purpose register and I/O port	The data transfer only between accumulator and I/O port
The memory map(64kb)is shared between I/O device and system memory	The I/O map is independent of the memory map,256 input device and 256 output device
More hardware is required to decode 16-bit address	Less hardware is required to decode 8-bit address

30.What is interfacing?

An interface is a shared boundary between the devices which involves sharing information.interfacing is the process of making two different systems communicate with each other.

31. What is memory mapping?

The assignment of memory address to various registers in a memory chip is called as memory mapping.

32. What is I/O mapping?

The assignment of addresss to varriousI/O devices in the memory chip is called as I/O mapping.

UNIT-2   PROGRAMMING OF 8085 PROCESSOR

1. What is an instruction?

An instruction is a binary pattern entered through an input device to command the microprocessor to perform that specific function.

2. How many operations are there in the instruction set of 8085 microprocessor?

There are 74 operations in the 8085 microprocessor

3. List out the five categories of the 8085 instructions.give ex of the instructions for each group?

1. Data transfer group – MOV,MVI,LXI
2. Arithmetic group – ADD,SUB,INR.
3. Logical group- ANA,XRA,CMP.
4. Branch group – JMP,JNZ,CALL.

5. Stack I/O and machine control group – PUSH,POP,IN,HLT.

4. Explain the difference between a JMP instruction and CALL instruction.

A JMP instruction permanently changes the program counter. A CALL instruction leaves information on the stack so that the original program execution sequence can be resumed.

5. Explain the purpose of the I/O instructions IN and OUT

The IN instruction is used to move data from an I/O port in to the accumulator. The OUT instruction is used to move data from the accumulator to an I/O port.
The IN and OUT instructions are used only on microprocessor,which use a separate address space for interfacing.

6. What is the difference between the shift and rotate instructions?

A rotate instruction is a closed loop instruction.that is,the data moved out at one end is put back in at the other end.the shift instruction loses the data that is moved out of the last bit locations.

7. List the four instructions which control the interrupt structure of the 8085 microprocessor?

DI(disable interrupts) EI(enable interrupts) RIM(read interrupt masks) SIM(set interrupt masks)

8. Mention the categories of instruction and give two ex for each category?

The instructions of 8085 can be categorized in to the following five
1. Data transfer MOV RD,RS,STA 16-BIT
2. Arithmetic ADD R,DCR M.
3. Logical XRI 8- bit,RAR
4. Branching JNZ CALL 16-bit
5. Machine control HLT,NOP

9. Explain LDA,STA AND DAA instructions

LDA copies the data byte in to the accumulator from the memory location specified by the 16-bit address.STA copies the data byte from the accumulator in the memory location specified by 16-bit address.DAA changes the content of the accumulator from binary to 4-bit BCD digits.

10. Explain the different instruction formats with ex?

The instruction set is grouped in to the following formats One byte instruction MOV C,A
Two byte instruction MVI A,39H Three byte instruction JMP 2345H

11. What is the use of addressing modes,mention the different types?

The various formats of specifying the operands are called as addressing modes,it is used to access the operands or data. The different types are as follows
1. Immediate addressing
2. Register addressing
3. Direct addressing
4. Indirect addressing
5. Implicit addressing

12. Define stack and stack related instructions?

The stack is a group of memory locations in the R/W memory that is used for the temporary storage of binary information during the execution of the program.the stack related instructions are PUSH and POP

13. Why do we use XRA A instruction?

The XRA A instruction is used to clear the contents of the accumulator and store the value 00H

14. How does the microprocessor differentiate b/w data and instruction ?

When the first m/c code of an instruction is fetched and decoded in the instruction register,the microprocessor recognizes the number of bytes required to fetch the entire instruction.for ex MVI A,data, the second byte is always considered as data.if the data byte is omitted by mistake whatever is in that memory location will be considered as data and the byte after the "data"will be treated as the next instruction.

15. Compare RET and POP

RET transfers the content of the top two locations of the stack to the PC	Pop transfers the content of the top two locations of the stack to the specified register pair
When RET is executed the SP is incremented by two.and it has 8 condational RETURN instructions	When POP is executed the SP is incremented by two and no conditional POP instructions

16. What are subroutine?

Procedures are group of instructions stored as a separate program in memory and it is called from the main program in memory and it is called from the main program whenever required.the type of procedure depends onwhere the procedures are stored in memory. If it is in the same code segment as that of the main program then it is a near procedure otherwise it is a far procedure.

17. What is a recursive procedures?

A recursive procedure is a procedure,which calls itself.recursive procedures are used to work with complex data structures called trees.if the procedure is called with N=3,then the N is decremented by 1 after each procedure CALL and the procedure is called until N=0.

18.How to access subroutine with in the main program procedure?

i) accessed by CALL & RET instruction

ii)machine code of instruction is put only once in the memory iii)with procedures less memory is required

iv)parameters can be passed in registers,memory location or stack

19. Define stack?

Stack is a sequence of RAM memory locations defined by the programmer.

20. How the microprocessor is synchronized with peripherals?

The timing and control unit synchronizes all the microprocessor operations with clock and generates control signals necessary for communication between the microprocessor and peripherals.

21. What is the minimum s/m and how it is formed in 8085?

A minimum s/m is one which is formed using minimum number of IC chips.the 8085 based minimum s/m is formed using 8155,8355 & 8755.

1. What is the use of 8051 chip?

Intel's 8251A is a universal synchronous asynchronous receiver and transmitter compatible with Intel's Processors. This may be programmed to operate in any of the serial communication modes built into it. This chip converts the parallel data into a serial stream of bits suitable for serial transmission. It is also able to receive a serial stream of bits and converts it into parallel data bytes to be read by a microprocessor.

2. What are the different types of methods used for data transmission?

The data transmission between points involves unidirectional or bi-directional transmission of meaningful digital data through a medium. There are basically there modes of data transmission
(a)Simplex
(b) Duplex
(c) Half Duplex

In simplex mode, data is transmitted only in one direction over a single communication channel. For example, a computer (CPU) may transmit data for a CRT display unit in this mode.

In duplex mode, data may be transferred between two transreceivers in both directions simultaneously.

In half duplex mode, on the other hand, data transmission may take place in either direction, but at a time may be transmitted only in one direction. For example, a computer may communication with a terminal in this mode. When the terminal sends data (i.e. terminal is sender).The message is received by the computer (i.e. computer is receiver). However, it is not possible to transmit data from the computer to terminal and from terminal to the computer simultaneously.

3. What is the various programmed data transfer method?
 i) Synchronous data transfer
 ii) Asynchronous data transfer
 iii) Interrupt driven data transfer

4. What is synchronous data transfer?

It is a data method which is used when the I/O device and the microprocessor match in speed. The transfer a data to or from the device, the user program issues a suitable instruction addressing the device. The data transfer is completed at the end of the execution of this instruction.

5. What is asynchronous data transfer?

It is a data transfer method which is used when the speed of I/O device does not match with the speed of the microprocessor. Asynchronous data transfer is also called as Handshaking.

6. What are the functional types used in control words of 8251a?

The control words of 8251A are divided into two functional types
1.   Mode Instruction control word
2.   Command Instruction control word

Mode Instruction control word: - This defines the general operational characteristics of 8251A.
Command Instruction control word: - The command instruction controls the actual operations of the selected format like enable transmit/receiver, error reset and modem control.

7. What are the basic modes of operation of 8255?

There are two basic modes of operation of 8255, viz.
  1. I/O mode.
  2. BSR mode

 In I/O mode, the 8255 ports work as programmable I/O ports, while in BSR mode only port C

(PC0-PC7) can be used to set or reset its individual port bits. Under the IO mode of operation, further there are three modes of operation of 8255, So as to support different types of applications, viz. mode 0, mode 1, and mode 2.

Mode 0- Basic I/O mode
Mode 1-Strobe I/O mode
Mode 2- Strobe bi-direction I/O

8. Write the features of mode 0 in 8255?

1. Two 8-bit ports (port A and port B) and two 4-bit ports (port C upper and lower) are available. The two 4-bit ports can be combined used as a third 8-bit port.

2. Any port can be used as an input or output port.

3. Output ports are latched. Input ports are not latched.

4. A maximum of four ports are available so that overall 16 I/O configurations are possible.

9. What are the features used mode 1 in 8255?

Two groups A and group B are available for strobe data transfer.

1. Each group contains one 8-bit data I/O port and one 4-bit control/data port.

2. The 8-bit data port can be either used as input or output port. The inputs and outputs both are latched.

3. Out of 8-bit port C, PC0-PC2 is used to generate control signals for port B and PC3=PC5 are used to generate control signals for port A. The inputs PC6, PC7 may be used as independent data lines.

10. What are the signals used in input control signal and output control signals?

Input control signals

STB (Strobe input) INTR (Interrupt request) OBF (Output buffer full) INTR (Interrupt request)

IBF (Input buffer full) Output control signal ACK (Acknowledge input)

11. What are the features used mode 2 in8255?

The signals 8-bit port in group A is available.

1. The 8-bit port is bi-directional and additionally a 5-bit control port is available.

2. Three I/O lines are available at port C, viz PC2-PC0.

3. Inputs and output are both latched.

4. The 5-bit control port C (PC3-PC7) is used for generating/accepting handshake Signals for the 8-bit data transfer on port A.

12. What are the modes of operation used in 8253?

Each of the three counters of 8253 can be operated in one of the following six modes of operation.

Mode 0 to 6

13. What are the different types of write operations used in 8253?

There are two types write operation in 8253

(1) Writing a control word register
(2) Writing a count value into a count register

The control word register accepts data from the data buffer and initialize

(a) Initializing the operating modes (mode 0- mode 4)
(b) Selection of counters (counter 0- counter 2)
(c) Choose binary /BCD counters.
(d) Loading of the counter registers.

The mode control register is a write only register and the CPU cannot read its contents.

14. Give the different types of command words used in 8259A

The command words of 8259A are classified in two groups

1. Initialization command words (ICWs)   2. Operation command words (OCWs)

15. Give the operation modes of 8259A?

(a) Fully Nest Mode   (b) End of Interrupt
(c) Automatic Rotation   (d) Automatic EOI mode
(e) Specific Rotation   (f) Special Mask Mode
(g) Edge and level Triggered Mode   (h) Reading 8259 Status
(i) Poll command   (j) Special Fully Nested Mode
(k) Buffered Mode   (l) Cascade Mode

16. Define scan counter?

The scan counter has two modes to scan the key matrix and refresh the display. In the encoded mode, the counter provides binary count that is to be externally decoded to provide the scan lines for keyboard and display. In the decoded scan mode, the counter internally decodes the least significant 2 bit and provides a decoded 1 out of 4 scan on SL3-SL 3. The keyboard and display both are in the same mode at a time.

17. What is the output modes used in 8279?

8279 provides two output modes for selecting the display options.

1. Display scan

2. In this mode, 8279 provides 8 or 16 character- multiplexed displays those can be organized as dual 4-bit or single 8-bit display units.

3. Display Entry 8279 allows options for data entry on the displays. The display data is entered for display from the right side or from the left side.

18. What are the modes used in keyboard modes?

1. Scanned Keyboard mode with 2 Key Lockout   2. Scanned Keyboard with N-Key Rollover.

3. Scanned Keyboard Special Error Mode.   4. Scanned Matrix Mode.

19. What are the modes used in display modes?

1. Left Entry Mode

In the left entry mode, the data is entered from the left side of the display unit. 2. Right Entry Mode
In the right entry mode, the first entry to be displayed is entered on the rightmost display.

20. What is the use of modem control unit in 8251?

The modem control unit handles the modem handshake signals to coordinate the communication between the modem and the USART.

21. List the operation modes of 8255?

a) I/O Mode
     i. Mode 0- Simple Input/Output.
     ii. Mode 1- Strobe Input/Output (handshake mode)
     iii. Mode 2- Strobe bi-directional mode
b) Bit Set/Reset Mode.

22. What is a control word?

It is a word stored in a register (control register) used to control the operation of a program digital device.

23. What is the purpose of control word written to control register in 8255?

The control words written to control register specify an I/O function for each I/O port. The bit D7 of the control word determines either the I/O functions of the BSR function.

24. What is the size of ports in 8255?
    Port - A: 8- bits   Port - B   : 8- bits
    Port -CU : 4- bits   Port -CL   : 4- bits

25. What is an USART?
        USART stands for universal Synchronous / Asynchronous Receiver / Transmitter. It is a programmable communication interface that can communicate by using either synchronous or asynchronous serial data.

26. What is the use of 8251 chip?
        8251 chip is mainly used as the asynchronous serial interface between the processor and the external equipment.

27. The 8279 is a programmable ------------------ interface.
    Keyboard/ Display

28. List the major components of the Keyboard/ Display interface.
        a. Keyboard section   b. Scan section   c. Display section   d.   CPU   interface section

29. What is Key bouncing?
        Mechanical switch are used as keys in most of the keyboard. When a key is pressed the contact bounce back and forth and settle down only after a small time delay (about 20ms). Even though a key is actuated once, it will appear to have been actuated several times. This problem is called Key Bouncing.

30. What is TXD?
        TXD- Transmitter Data Output
This output pin carries serial of the transmitted data bits along with other information like start bit, stop bits and priority bit.

31. Define HRQ?
        The hold request output request the access of the system bus. In non- cascaded 8257 systems, this is connected with HOLD pin of CPU. In cascade mode, this pin of a slave is connected with a DRQ input line of the master 8257, while that of the master is connected with HOLD input of the CPU.

32. What is RXD?
        RXD- Receive Data Input
This input pin of 8251A receives a composite stream of the data to be received by 8251A.

33. What are the internal devices of a typical DAC?
        The internal devices of a DAC are R/2R resistive network, an internal latch and current to voltage converting amplifier.

34. What is setting or conversion time in DAC?
        The time taken by the DAC to convert a given digital data to corresponding analog signal is called conversion time.

35. What are the different types of ADC?
        The different types of ADC are successive approximation ADC, counter type ADC, flash type ADC, integrator converters and voltage to frequency converters.

1. What is mean by microcontroller?

A device which contains 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. Explain DJNZ instruction of Intel 8051 microcontroller? a) DJNZ Rn, rel

Decrement the content of the register Rn and jump if not zero. b) DJNZ direct, rel

Decrement the content of direct 8- bit address and jump if not zero.

3. State the function of RS1 and RS0 bits in the flag register of Intel 8051 microcontroller?

RS1, RS0- Register bank select bits RS1, RS0- Bank

Bank 0
Bank 1
Bank 2
Bank 3

4. Give the alternate functions for the port pins of port3?

RD WR T1 T0
INT 1 INT 0 TXD RXD

RD – Read data control output
WR – Write data control output

T1 – Timer / counter 1 external input or test
pin T0 – Timer / counter 0 external input or
test pin INT 1 – Interrupt 1 input pin
INT 0 – interrupt 0 input pin

TXD – Transmit data pin for serial port in UART mode
RXD – Receive data pin for serial port in UART mode

5. Specify the single instruction, which clears the most significant bit of B register of 8051, without affecting the remaining bits.

Single instruction, which clears the most significant bit of B register of 8051, without affecting the remaining bits, is CLR B.7.

6. Explain the function of the pins PSEN and EA of 8051.

PSEN: PSEN stands for program store enable. In 8051 based system in which an external ROM holds the program code, this pin is connected to the OE pin of the ROM.

EA: EA stands for external access. When the EA pin is connected to Vcc, program fetched to address 0000H through 0FFFH are directed to the internal ROM and program fetches to addresses 1000H through FFFFH are directed to external ROM/EPROM. When the EA pin is grounded, all addresses fetched by program are directed to the external ROM/EPROM.

7. Explain the 16-bit registers DPTR and SP of 8051. DPTR:

DPTR stands for data pointer. DPTR consists of a high byte (DPH) and a low byte (DPL). Its function is to hold a 16-bit address. It may be manipulated as a 16- bit data registers. It serves as a base register in indirect jumps, lookup table instructions and external data transfer.

SP:

SP stands for stack pointer. SP is a 8-bit wide register. It is incremented before data is stored during PUSH and CALL instructions. The stack array can reside anywhere in-chip RAM. The stack pointer is initiailsed to 07H after a reset. This causes the stack to begin at location. 08H.

8. Name the special functions registers available in 8051.

Accumulator   B Register
Program status Word.
Stack pointer.   Data pointer
Port 0   Port 1   Port 2   Port 3
Interrupt priority control register.
Interrupt enable control register.

9. Explain the register IE format of 8051.

        EA ET2 ES
        ET1 EX1 ET0 EX0
        EA- Enable all control bit.

        ET2- Timer 2 interrupt enable bit.
        ES- Enable serial port control bit.
        ET1- Enable Timer1 control bit.
        EX1-Enable external interrupt1 control bit.
        ET0-Enable Timer0 control bit.
        EX0-Enable external interrupt0 control bit.

10. Name the five interrupt sources of 8051?

        The interrupt
are: Vector address

External interrupt 0: IE0: 0003H
Timers interrupt 0: TF0: 000BH
External interrupt 1: IE1: 0013H T
imers interrupt 1: TF1:001BH
Serial interrupt

Receive interrupt: RI: 0023H
Transmit interrupt: TI: 0023H

11.Write a program to subtract the contents of RI of Bank0 from the contents of R0 0f Bank2.

MOV PSW, #10
MOV A, R0
MOV PSW, #00
SUBB A, R1

12. How the RS-232 serial bus is interrupt to 1TL logic device?

        The RS-232 signal voltage level devices are not compatible with TTL logic levels. Hence for interfacing TTL devices to RS-232 serial bus, level converters are used. The popularly used level converters are MC 1488 & MC 1489 or MAX 232.

13.List some of the features of 8096 microcontroller.

        a. The 8096 is a 16-bit microcontroller.

        b. the 8096 is designed to use in application which require high speed calculations and fast I/O operation.

        c. The high speed I/O section of an 8096 includes a 16-bit timer, a 16- bit counter, a 4 input programmable edge detector, 4 software timer and counter 6-output programmable events
        Generator.

        d. It has 100 instructions, which can operate on bit, byte, word and double words.

        e. The bit operation is possible and these can be performed on any bit in the register file or in the special function register.

14. List the features of 8051 microcontroller?

The features are

- Single supply +5 volt operation using HMOS technology.
- 4096 bytes program memory on chip (not on 8031)
- 128 data register banks
- Four register mode, 16-bit timer/ counter.
- Extensive Boolean processing capabilities.
- 64 KB external RAM size
- 32 bi-directional individually addressable I/O lines.
- 8 bit CPU optimized for control applications.

16. Explain the operating mode 0 of 8051 serial ports?

In this mode serial enters & exits through RXD, TXD outputs the shift clock 8 bits are transmitted/received: 8 data bits (LSB first). The baud rate is fixed at 1/12 the oscillator frequency.

17. Explain the operating mode 0 of 8051 ports?

In this mode 11 bits are transmitted (through TXD) or received (through RXD): a start bit (0), 8 data bits (LSB first) a, programmable 9th data bit, & a stop bit (1).ON transmit the 9th data bit (TB* in SCON) can be assigned the value of 0 or 1.

For eg: the parity bit (P, in the PSW) could be moved into TB8. On receive the 9th data bit go in to the RS8 in Special Function Register SCON, while the stop bit is ignored. The baud rate is programmable to either 1/32, or 1/64 the oscillator frequency.

18. Explain the mode 3 of 8051 serial ports?

In this mode 11 bits are transmitted (through TXD) or received (through RXD): a start bit (0), 8 data bits (LSB first) a, programmable 9th data bit, & a stop bit (1). In fact, Mode 3 is the same as Mode 2 in all respect except the baud rate. The baud rate in Mode 3 is variable.

In all the four modes, transmission is initiated by any instruction that uses SBUF as a destination register. Reception is initiated in Mode 0 by the condition RI=0 & REN=1. Reception is initiated in other modes by the incoming start bit if REn=1.

19. List the addressing modes of 8051?

Direct addressing
Register addressing

Register indirect addressing
Implicit addressing
Immediate addressing Index
addressing
Bit addressing

UNIT 5   MICRO CONTROLLER PROGRAMMING & APPLICATIONS

1. Write a program using 8051 assembly language to change the data 55h stored in the lower byte of the data pointer register to AAH using rotate instruction?

    MOV DPL,#55H
    MOV A,DPL RL
    A
    LABEL : SJMP Label

2. Explain the contents of the accumulator after the execution of the following program segments?

    MOV A,#3CH
    MOV R4,#66H
    ANL A,R4
    A 3C
    R4 66
    A 24

3. Write a program to load accumulator a,DPH and DPL with 30H?

    MOV A,#30
    MOV DPH,A
    MOV DPL,A

4. Write a program to perform multiplication of 2 nos using 8051?

    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

5. Write a program to mask the 0th &7th bit using 8051?

    MOV A,#data
    ANL A,#81
    MOV DPTR,#4500
    MOVX @DPTR,A
    LOOP SJMP LOOP

6. Write about CALL statement in 8051?

    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.

7. Write about the jump statement?

    There are three forms of jump.they
    are LJMP(Long-jump)-address 16
    AJMP(Absolute jump)-address 11
    Sjmp(short jump)-relative address

8. Write a program to load accumulator DPH & DPL using 8051?

    MOV A,#30
    MOV DPH,A

MOV DPL,A

9. Write a program to find 2's complement using 8051?
MOV
A,R0 CPL
A INC A

10. Write a program to add two 8-bit numbers using 8051?
MOV A,#30H
ADD A,#50H

11. Write a program to swap two numbers using 8051?
MOV A,#data
SWAP A

12. Write a program to subtract two 8-bit numbers & exchange the digits using 8051?
MOV A,#9F
MOV R0,#40
SUBB A,R0
SWAP A

13. Write a program to subtract the contents of R1 of bank 0from the contents of R0 of bank 2 using 8051?
MOV PSW,#10
MOV A,R0
MOV PSW,#00
SUBB A,R1

14. Explain the operating mode0 of 8051 serial ports?
In this mode serial enters & exits through RXD,TXD output the shift clock 8 bits are transmitted or received 8 data bits(LSB first).the baud rate is fixed at 1/12 the oscillator frequency.

15. Explain the operating mode2 of 8051 serial ports?
In this mode 11 bits are transmitted (through TXD)or received(through RXD)A start bit(0),8 data bits(LSB first),a programmable 9th data bit & a stop bit(1) ON transmit the 9th data bit(TB*in SCON) can be assigned the value of 0 or 1.or for eg: the parity bit(p,in the PSW) could be moved into TB8. On receive the 9th data bit go in to the RB8 in special function register SCON ,while the stop bit is ignored.the baud rate is programmable to either 1/32 or 1/64 the oscillator frequency.

16. Explain the mode3 of 8051 serial ports?
In this mode 11 bits are transmitted(through TXD)or received(through RXD): astart bit(0).8 data bits(LSB first), aprogrammable 9th data bit,& a stop bit(1).in fact, mode3 is the same as mode2 in all respects except the baud rate. the baud rate in mode3 is variable.in all the four modes, transmission is intiated by any instruction that uses SBUF as a destination register.reception is initiated by any instruction that uses SBUF as a destination register.reception is intiated in mode0 by the condition R1=0 & REN=1.reception is initiated in other modes by the incoming start bit if REN-1.

17. What are the tasks involved in keyboard interfacing?
The task involved in keyboard interfacing are sensing a keyboard interfacing are sensing a key actuation, de bouncing the key and generating key codes(decoding the key).these task are performed software if the keyboard is interfaced through ports and they are performed by hardware if the keyboard is interfaced through 8279.

18. How a keyboard matrix is formed in keyboard interface ?

        The return lines RL0 to RL7 of 8279 are used to form the columns of keyboard matrix.in decoded scan the scan lines SLO to SL3 of 8279 are used to form the rows of keyboard matrix. In encoded scan mode, the output lines of external decoder are used as rows of keyboard matrix.

19. What is scanning in keyboard and what is scan time?

        The process of sending a zero to each row of a keyboard matrix and reading the columns for key actuation is called scanning. the scan time is the time taken by the processor to scan all the rows one by one starting from first row and coming back to the first row.

20. What is scanning in display and what is the scan time?

        In display devices the process of sending display codes to 7-segment LED'S to display the led's one by one is called scanning. The scan time is the time taken to display all the 7-segment LED'S one by one, starting from first LED and coming back to the first LED again.

21. Give some ex of input devices to microprocessor-based systems

        The input devices used in the microprocessor- based system are keyboards, DIP switches ,ADC, floppy disc, etc.

UNIT 1

1. Briefly explain memory interfacing techniques used in 8085 microprocessor
2. Deduce functional description of 8085 microprocessor with neat diagram.
3. Explain in detail about the various addressing modes in 8085 processor.
4. Describe the interrupts of 8085 Microprocessor
5. Describe the memory interfacing with 8085 microprocessor.
6. Draw and explain the timing diagram for SHLD 16 bit address.
7. Draw and explain the timing diagram for MVI A,32H
8. Draw the timing diagram for instruction CALL 4322H.Assume relevant details.
9. Explain the I/O read and write operation of 8085 processor with timing diagram.
10. Draw the timing diagram for memory read cycle and explain

UNIT 2

1. Write a program to obtain 1's complement of 16-bit number stored at location FC15(H) and FC16(H).Store the result at location FC17 (H) and FC18 (H).MSB should be in location FC16H and FC18H.

2. Write the program to multiply two 8-bit numbers to result in 16-bit number.

3. Write the 8085 ALP to convert hexadecimal value to a decimal value and explain it.

4. Write the 8085 ALP for modulo 10 counter with flowchart

5. With suitable examples describe the data manipulation instructions of 8085.

6. Discuss about the data transfer and control instruction of 8085 processor.

7. Write short notes on branching operations available in 8085

UNIT 3

1. Discuss internal architecture of 8051 microcontroller in detail

2. Explain the five addressing modes of 8051 microcontroller with example.

3. Explain the 8051 timers in detail with suitable diagrams.

4. Explain Counter/Timer applications of 8051.

5. Discuss the internal memory organization of the 8051 microcontroller.

6. Discuss about the memory organization and special function registers in 8051

UNIT 4

1. Discuss the various modes of operation of the programmable interval timer 8253
2. Draw the Block diagram of 8255(PPI) and explain its various operating modes
3. Draw the Block diagram of 8259(PIC) and explain the initialization command words.
4. Describe how 8279 keyboard and Display controller is interfaced to 8085.
5. Explain how the serial data transfer can be performed using 8251 USART

UNIT 5

1. Explain keyboard and display interface with microcontroller
2. How does one control a stepper motor via optoisolator? Explain it with a neat diagram
3. Explain the 4x4 keyboard interfacing with microcontroller 8051
4. Explain the following 8051 instructions with example: DA, MUL, SWAP, SJMP
5. Explain the microprocessor application in a closed loop control of servo motor.
6. Describe how washing machine actions are designed using a microcontroller