UNIT-2 PROGRAMMING OF 8085 PROCESSOR
TWO MARKS

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. Compare CALL and PUSH instructions

CALL	PUSH
When CALL is executed the microprocessor automatically stores the 16-bit address of the instruction next to CALL on the stack	The program uses the instruction PUSH to save the contents of the register pair on the stack
When CALL is executed the stack pointer is decremented by two	When PUSH is executed the stack pointer register is decremented by two

15. 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.

16. Compare RET and POP

RET	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

17. 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.

18. 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.

19. 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

20. Define stack?

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

21. 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.

22. 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.

UNIT V -8051 MICRO CONTROLLER PROGRAMMING & APPLICATIONS

TWO MARKS

1. **What is micro controller?**
   Micro controller is a microprocessor with limited number of RAM, ROM, I/O ports and timer on a single chip i.e. all the required hardware for a system is combined together on a single chip.

2. **Mention any two real time micro controllers**.
   - Micro oven
   - Washing machine

3. **Give any two differences between microprocessor and micro controller.**

Microprocessor	Micro controller
Register-oriented architecture	Memory-oriented architecture
It do not have internal ROM, RAM and I/O port	It contains RAM, ROM and I/O in a single chip

4. **What are the bits used in the program status word of 8031 micro controller?**
   The various status bits used are the carry bit, auxiliary carry bit, overflow bit, parity bit, general purpose flag bit and register select bank control bits.

5. **What is the use of PSEN signal used in IC 8031?**
   It is the control signal that enables the external program memory. When the device executes the program from external program memory PSEN is activated. During the execution of internal program memory PSEN is not activated.

6. **What are the registers used for timer operations?**
   The registers used for timer operation are TH0, TH1, TL0, TL1, TMOD, TCON and IE.

7. **What is the difference between mode 0 and mode 1 timer operation of IC8031?**
   In mode 0 13 bits register is used whereas in mode1 16 bits register is used.

8. **What is meant by transition activated interrupts?**
   In transition-activated interrupts, the timer control register bits are set when the transition at the INT input (changes from logic 1 to 0 or vice versa).

9. **What are the use of MOVC and MOVX instruction?**
   MOVC-used to move the data from code (program) memory to accumulator.
   MOVX-used to move the data from external memory to the accumulator.

10. Give any two differences between LCALL and ACALL instruction.

Long call (LCALL)	Absolute call (ACALL)
3 byte instruction	2byte instruction
Issues 11 bit absolute addressing	It addresses full 64 Kbytes

11.List some assembler directives used by the compiler of 8031.
- ORG
- EQU
- DFB

12.What is meant by power down mode? (NOV/DEC 2010)

In 8096 micro controller the upper 16 bytes of RAM is called power down RAM because these locations receive their power from the Vpd pin in the power down mode. Hence in the power down only these locations are alive.

13.Specify the functions of various ports in 8096.

Port 0 – input port, used for A to D converter inputs.
Port 1- bi directional ports
Port 2- input, output as well as bi-directional pins
Port 3,4- bi directional ports used to expand the memory.

14.Why the ALU used in 8096 is called as RALU?

Here the ALU can access all the registers in the RAM memory and no need for accumulator. Hence this memory is termed as RALU.

15.Give any four features of 8096.
- Contains full duplex serial port
- Watch dog timer to recover from errors
- Programmable 8-source priority interrupt system.
- Hardware multiply and divide instruction

16. What is cross assembler? (NOV/DEC 2009)

Assemblers which run on one CPU but which generate object code for another CPU are called cross assemblers.

17. What is the basic difference between counter and time?

In the case of timer operation counter is connected to the internal clock where as in counter operation it is connected to the external clock having different baud rates.

18.What is use of DPTR in 8031 micro controllers?

It consists of a high byte and low byte data of a 16-bit external data RAM address. It is accessed as a 16 bit register or 2,8 bit registers.

19. What was the first developed microprocessor?
The first developed Intel microprocessor was 4-bit 4004 processor.

20. Mention any few 8-bit and 16-bit micro controllers.
      8 bit micro controllers-Intel 8051,PIC 16C56,motorolo 6805,TMS 7500.
      16 bit micro controllers- H81532,Intel 8096,MCS-96 family.

21. What are the input units used to generate digital data inputs?
      DIP switches and thumb switches are the 2 different input units used to give digital input to the processor.

22. What are the three different types of DIP switches? [APRIL/MAY 2011]
- Piano DIP switches
- Slide DIP switches
- Tristate DIP switches

23. What does thumb switches mean?
      These are rotary mechanical devices that convert the displayed decimal numbers to binary mechanical positions and are read electronically by an electronic counter or a microprocessor.

24. What is the function of watchdog timer?
      A Watch dog timer resets the PIC if the chip ever malfunctions and deviates from its normal operation.

25. What is data memory space? (APRIL/MAY 2009)

      The processor can read data from this memory space and can write data to this memory space. It cannot execute program instructions from this memory space. 8051 internal RAM is in this memory space.

26. What is called down loaded program?
      The 8051 can input a block of data through its serial communications port, load that data into memory, and then execute that data as a program. It is used to change the program operating in a remote microprocessor based controller.

27. What is scratch pad?
      It is an 8-bit register. It is incremented just before data is stored by using the push or call instructions or the interrupt.

28. What is port latch?
      The port latch allows storing data going out of the port or coming to the port.

8051 APPLICATIONS

1. What are the basic digital output units used in microcomputer?
A simple system uses 7-segment LED displays for numbers and hexadecimal letters, 18-segment LED display or 5 x 7 matrix LED displays for displaying numbers and letters of an alphabet.

2. Why the seven segment LED display is referred as static display? (Nov/Dec-2010)
In this circuit the current is passed through the display at all times, and hence it is referred as static display.

3. Give any two differences between memory mapped and peripheral mapped I/O interfacing.

Memory mapped I/O interfacing	Peripheral mapped I/O interfacing
Peripheral is identified by 16-bit memory address	Peripheral is identified with an 8-bit address
Data transfer is implemented by using memory related instructions such as STA, LDA, MOV M,R and MOV R,M.	Data transfer is implemented by IN and OUT instructions.

4. What are the interface devices used to connect output port and high power devices?
Integrated circuit buffers and transistor buffers are used as interface devices between the output port pins and high power devices.

5. What is the use of sample and HOLD IC?
Sample and hold circuit samples an input signal and hold s on to its last sampled value until the input is sampled again.

6. What is aperture time?
It is the delay required between HOLD command and an input analog transition, so that the transmission does not affect the held output.

7. State some applications of sample and HOLD circuit.
- Automatic test systems
- Industrial process controls
- Arbitrary function generators
- Avionics equipment

8. What is the disadvantage in keyboard interfacing using ports?
The disadvantage in keyboard interfacing using ports is that most of the processor time is utilized in keyboard scanning and debouncing. As a result the computational speed of the processor will be reduced.

9. What is the advantage in using INTEL 8279 for keyboard and display interfacing?

When 8279 is used for keyboard and display interfacing, it takes care of all the task involved in keyboard scanning and display refreshing. Hence the processor is relieved from the task of keyboard scanning, debouncing, keyboard generation and display refreshing and the processor time can be more effectively used fro computing.

10. What is a programmable peripheral device?

If the functions performed by a peripheral device can be altered or changed by a program instruction then the peripheral device can be altered or changed by a program instruction then the peripheral device is called programmable device.

11. What is synchronous data transfer scheme?

In synchronous data transfer scheme, the processor does not check the readiness of the device after a command have been issued for read/write operation in this scheme the processor will request the device to get ready and then read/write to the device immediately after the request.

12. What is asynchronous data transfer scheme?

In asynchronous data transfer scheme, first the processor sends a request to the device for read/write operation. Then the processor keeps on polling the status of the device. Once the device is ready, the processor executes a data transfer instruction to complete the process.

13. What is an interfacing circuit? (Nov/Dec-2009)

An interfacing circuit is an electronic circuit, which is used to connect the peripherals to the computer.

14. What are the input devices used in single board microcomputer?

The input devices used in single board microcomputer are hex keyboard, DIP switches, ADC, floppy disc etc

15. What are the output devices used in single board microcomputer?

The output devices used in single board microcomputer are 7 segment LEDs, LCD display, Printer, Floppy disc , CRT terminal etc

16. How is an input and output device interfaced with 8085 microprocessor?

An input and output device is interfaced with 8085 microprocessor either as a peripheral I/O or as a memory mapped I/O. In the peripheral I/O, the instructions IN/OUT are used for data transfer, and the device is identified by an 8 bit address. In the

memory mapped I/O, memory related instructions are used for data transfer, and the device is identified by a 16 bit address.

17. What is a port?

A Port is a buffered IC, which is used to hold the data transmitted from microprocessor to I/O device or vice-versa.

18. What is the need for port?

The I/O devices are generally slow devices and their timing characteristics do not match with processor timings. Hence the I/O devices are connected to system bus through the ports.

19. Give some examples of port devices used in 8085 microprocessor based system.

The various INTEL I/O port devices used in 8085 microprocessor-based systems are 8212,8155,8156,8255,8355 and 8755.

20. Can an input port and output port have the same port address?

Yes. They will be differentiated by control signals. The RD is used to enable the input port and the WR is used to enable the output port.

21. What are the different methods of interfacing I/O devices to 8085-based system?

The different methods of interfacing I/O devices are,
  a) Memory mapped I/O device
  b) Standard mapped I/O Device (or) Isolated mapping

22. What are the parts of seven segment LED?

Seven segment LED consists of seven light emitting diode segments and one segment for the decimal point.

23. Give some applications of seven segments LED

They are used on calculators and other products, which only need limited display.
It can give limited alphabetical information.

24 What are the two types of 7 segments LED?

The two types of 7 segments LED are,
  a) Common anode type
  b) Common Cathode type

25. Explain how the seven segment LEDs are interfaced to 8085 processor.

The seven segment LEDs are interfaced to 8085 processor using INTEL 8279 keyboard and display controller. The 8279 is a dedicated controller which takes care of keyboard scanning and display refreshing. A maximum of 16 number of 7 Segment LEDs can be interfaced using one 8279 in 8085 based system as multiplexed display.

26. What is a multiplexed display?

The process of switching ON the display devices one by one for a specified time interval is called Multiplexed display. In microprocessor based systems six to eight 7 segment LEDs are interfaced to provide multiplexed display. At any one time only one 7 segment LED is made to glow. After few milliseconds the next & segment LED is made to glow and so on. Due to persistent of vision, it will appear as if the LEDs are glowing continuously.

27. Give some advantages of multiplexed display?

The advantages of multiplexed display are,
  a) Only one BCD to 7 segment decoder, IC 7447 is needed for all the 7 segment LEDs.
  b) In a current requirement of one 7 segment LED, 6 to 8 LEDs can be displayed or interfaced.
  c) The power requirements of the display devices are reduced to a very large extent.

28. Define memory mapped I/O. (Apr/May-06)

Microprocessor such as the 8085 and Z80 can address 256 out port ports and 256 input ports by use of output and input instructions in the microprocessor program. One way to expand beyond this number of ports is to define memory location as I/O ports. An instruction to write memory at such a location is interpreted by the external hardware as an output. An instruction to read memory is interpreted as an input. Defining I/O ports in this way is called memory mapped I/O.

29. Compare the memory mapped I/O and Standard mapped I/O

Memory mapped I/O	Standard mapped I/O
a) 16 bit address is allotted to an I/O device	a) 8 bit address is allotted to an I/O device
b) The devices are accessed by memory read or memory write cycle	b) The devices are accessed by I/O 8 read or I/O write cycle
c) All instructions related to memory can be used for data transfer	c) Only IN and OUT instructions can be used for data transfer
d) A large number of I/O ports can be interfaced.	d) Only 256 ports can be interfaced

UNIT- 4 PERIPHERAL INTERFACING

TWO MARKS

1. What is the use of 8051 chip? 1

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?

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) IBF (Input buffer full) INTR (Interrupt request) Output control signal OBF (Output buffer full) ACK (Acknowledge input) INTR (Interrupt request)

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.

1. Mode 0 (Interrupt on terminal count) 2. Mode 1 (Programmable monoshot)

3. Mode 2 (Rate generator) 4. Mode 3 (Square wave generator)

5. Mode 4 (Software triggered strobe) 6. Mode 5 (Hardware triggered strobe)

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.

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.

PART B
1. Explain any one 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
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-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 mamory 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.Give the register organization of 8085?

Temp reg   Temp reg
W(8)   Z(8)
Register   register

B(8)   E(8)
Register   Register
H(8)   L(8)
Stack pointer(16)
Program counter(16)

28. 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.

29. Define flags?

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

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

30. 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

31. 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.

32. 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.