

1. What do you mean by Addressing modes? (May/June 2014)

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

2. What is meant by Vectored interrupt? (May/June 2014)

When the external device interrupts the processor, processor has to execute interrupt service routine for servicing the interrupt. If the internal control circuit of the processor produces a CALL to a predefined memory location which is the starting address of interrupt service routine, then that address is called Vector address and such interrupts are called vector interrupts.

3. Name the hardware interrupts of 8086. (May/June 2013, Nov/Dec 2010)

- i. Divide by zero interrupt (Type 0)
- ii. Single step interrupt (Type 1)
- iii. Non Maskable interrupt (Type 2)
- iv. Breakpoint interrupt (Type 3)
- v. Overflow interrupt (Type 4)

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5. What address in the interrupt vector table are used for a Type-2 interrupt in 8086? (Nov/Dec2012)

008H (CS base address) and 00CH (IP offset) are the addresses in the interrupt vector table are used for a Type-2 interrupt in 8086.

6. Why do we use Macros? (Nov/ Dec 2012)

Macro is a group of instruction. The macro assembler generates the code in the program each time where the macro is called. Macros are defined by MACRO & ENDM directives. Creating macro is similar to creating new opcodes that can be used in the program

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INIT MACRO
MOV AX, data MO
V DS MOV ES, AX
ENDM

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7. What is BIOS function call in 8086 μ p? (May/June 2012)

With the software interrupts you can call the desired routines from many different programs in system.eg. BIOS in IBM PC. The IBM PC has in its ROM collection of routines, each performing some specific function such as reading character from keyboard, writing character to CRT. This collection of routines referred to as Basic Input Output System or BIOS. The BIOS routines are called with INT instructions.

8. Give the importance of the assembler directive EVEN. (Nov/Dec 2011)

The assembler directive EVEN aligns next variable or instruction to even b

9. Name the registers available in 8086. (April/May 2011)

- (i) General purpose registers
- (ii) Segment registers
- (iii) Pointers and index registers
- (iv) Flag Registers.

10. What are the general purposes registers in 8086? (Nov/Dec 2011)

AX, BX, CX, DX are the general purpose registers in 8086.

11. Define microprocessor?

A microprocessor is a multipurpose, programmable, clock-driven, register –based electronic device that reads binary instructions from a storage device called memory. Accepts binary data as input and processes data according to instructions, and provides result as output.

12. What is the function of HOLD and HLDA?

HOLD- It indicates when another device is requesting the use of address and data bus (like DMA controller). HLDA (Hold Acknowledge)- It indicates that HOLD request has been received. After the removal of HOLD request the HLDA goes low.

13. List the operations performed by IO/M in 8085.

Memory Read, Memory Write, I/O Read, I/O Write are the operations performed by IO/M in 8085.

14. Why address bus is unidirectional?

It is a 16 bit communication line (A0-A15). It is used to indicate the location of data. Since the data flows from MPU (microprocessor unit) to Peripheral devices, the address bus is unidirectional.

15. List some of the logical instructions in 8085.

ANA B, ORA B, XRA B, CMA, STC.

UNIT II 8086 SYSTEM BUS STRUCTURE**1. What are the advantages of Coprocessor? (May/ June 2014)**

- i) It is a high performance data processor.
 - ii) It follows IEEE floating point standard.
- It is multibus compatible.

2. What is meant by loosely coupled configuration? (May/ June 2014)

Loosely coupled system consists of different modules. Each module may consist of an 8086, another processor capable of being a bus master, or processor or closely coupled configuration. Normally each processor has its own local memory and I/O devices, to which other processors do not have direct access. But they can share system resources.

3. How does CPU differentiate the 8087 instructions from its own instructions? (May/June 2013)

8087 instructions can be distinguished from 8086 instructions by letter F which stands for floating point number. All mnemonics in 8087 begin with letter F. It has 68 instructions.

4. **In what ways are the microprocessor and co-processor differ from each other? (Nov/Dec 2012 , April/May 2010).**

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 Coprocessor is a processor which is specially designed processor to work under the control of the processor and to support special processing capabilities.

5. **List any four 8087 data formats. (May/June 2012)**

- i) Word integer
- ii) Short integer
- iii) Short real
- iv) Long real

6. **What is pipelining?**

Fetching the next instruction while the current instruction executes is called pipelining.

7. **How many data lines and address lines are available in 8086?**

Address lines= 20 bit address bus Data lines= 16 bit data bus

8. **What are the segment registers of 8086?**

CS- Code segment, DS-Data segment, ES-Extra segment, SS- Stack segment.

9. **What is the use of Instruction Queue in 8086 microprocessor?**

The queue operates on the principle of first in first out(FIFO). So that the execution unit gets the instruction for execution in the order they fetched .Feature of fetching the next instruction while the current instruction is executing is called pipelining which will reduce the execution time.

10. **What happened in 8086 when DEN =0 and DTR=1 ?**

This signal informs the transceivers that the CPU is ready to send data.

11. **How clock signal is generated in 8086? What is the maximum internal clock frequency of 8086?**

The crystal oscillator in 8284 generates a square wave signal at the same frequency as the crystal . The maximum internal clock frequency of 8086 is 5Mhz.

UNIT III I/O INTERFACING

1. **List the features of memory mapped I/O. (April/May 2014)**

Maximum number of I/O devices are 1 Mbyte.

Requires decoding of 20 address lines and hence more hardware involved.

2. **What are the basic modes of operation of 8255? (Nov/Dec 2013)**

There are two basic modes of operation of 8255. They are:

- i) I/O mode
- ii) BSR mode

3. **What is DMA? (Nov/Dec 2011, 2012)**

A special control unit may be provided to enable transfer a block of data directly between an external device and memory without contiguous intervention by the CPU. This approach is called DMA (Direct Memory Access).

4. State the advantages of DMA. (Nov/Dec 2011, 2012)

- (i) The data transfer is very fast.
- (ii) Processor is not involved in the data transfer operation and hence it is free to execute other tasks.

5. What is the difference between two key lockout and N- key rollover modes in 8279? (Nov/Dec2010)

2-Key lock out: Simultaneous key depression is not allowed.

N-key rollover: Each key depression is treated independently from all others.

6. What is the cascaded mode of 8259 programmable interrupt controller? (April/May 2010)

The mode in which 8259s are interconnected to get multiple interrupt is called cascaded mode.

7. What is the function of scan section in 8279 controller? (April/May 2014)

- (i) Encoded scan- Scan lines are decoded externally to provide 8 scan lines.
- (ii) Decoded scan- internal decoder decodes and provides 4 scan lines.

8. Name any 8 processor control instructions.

CLC, WAIT, CMC, HLT, STC, LOCK, STD, NOP.

9. What is meant by software interrupt in 8086?

The software interrupts are program instructions. These instructions are inserted at desired locations in a program. While running a program, if a software interrupt is encountered then the processor executes an interrupt service routine (ISR).

10. State the functional units available in 8086?

BIU- Bus Interface Unit

EU- Execution Unit

11. State the modes in which 8086 operates?

Minimum mode

Maximum mode.

12. What is the function of TF,DF,IF in 8086?

TF: It is used for single stepping through a program. In the mode, the 8086 generates an internal interrupt after execution of each instruction.

DF: It is used to set direction in string operation.

IF: It is used to receive external maskable interrupts through INTR pin. Clearing IF, disable these interrupts.

UNIT IV MICROCONTROLLER

1. List the different types of 8051 instructions. (April/May 2010)

- (i) Data transfer instructions
- (ii) Byte level logical instructions
- (iii) Arithmetic instructions
- (iv) Bit level logical instructions
- (v) Rotate and Swap instructions

2. What are the addressing modes supported by 8051? (Nov/Dec 2010, April/May 2011)

- (i) Register addressing mode
- (ii) Direct Byte addressing mode
- (iii) Register Indirect addressing mode
- (iv) Immediate addressing mode
- (v) Register Specific addressing mode
- (vi) Index address addressing mode
- (vii) Stack addressing mode

3. What is the difference between MOVX and MOV? (Nov/Dec 2013)

MOV: Copy the byte variable indicated by src-byte into the dest-byte location. Flags are not affected.

MOVX: Copy the contents of the external address to the accumulator, data memory

4. Name the flags that are stored in PSW in 8051. (April/May 2011, Nov/Dec 2011)

Program Status Word is also known as Flag register. It has

- (i) Carry flag
- (ii) Auxiliary Carry flag (iii) FO
- (iv) Register Bank Select
- (v) Overflow flag (vi) Parity flag

5. What are the various operations performed by Boolean variable instructions of 8051? (April/May 2010)

- (i) Logical-AND for bit variables
- (ii) Logical-OR for bit variables
- (iii) Move bit data.

6. What is the purpose for the 8255 PPI?

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.

7. What is the use of mode 2 in 8255A PPI?

This mode is used primarily in applications such as data transfer between two computers or floppy disk controller interface

8. What is the purpose for scan section in Keyboard interface?

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

9. What is USART?

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 .

10. Define Baud?

The rate at which the bits are transmitted is called Baud

11. Define simplex transmission?

In simplex transmission, data are transmitted in only one direction. Example: transmission from a microcomputer to a printer.

UNIT V INTERFACING MICROCONTROLLER

1. List the applications of Microcontroller. (April/ May 2008)

- (i) Robotics
- (ii) Embedded Systems
- (iii) Automotive applications.

2. What are the sources of interrupt s in 8051? (Nov/ Dec 2010)

- (i) External hardware interrupts 0 (INT0)
- (ii) Timer 0 interrupt (TF0)
- (iii) External hardware interrupts 1 (INT1)
- (iv) Timer 1 interrupts (TF1)

3. What is the function of SM2 bit in the SCON register of 8051? (Nov/Dec 2007)

SM2- Serial port Mode control bit 2. Set by software to disable reception of frames for which bit 8 is zero.

4. What is Microcontroller?

Microcontroller incorporates all the features that are found in microprocessor with the added features of in-built ROM, RAM, Parallel I/O, Serial I/O, counters and clock circuit to make a micro computer system on its own.

5. Define baud rate.

Baud rate is used to indicate the rate at which data is being transferred . Baud rate = $1/\text{Time}$ for a bit cell.

6. Name the interrupts of 8051 microcontroller.

External interrupt-0 , External interrupt-1, Timer-0 interrupt, Timer-1 interrupt, and serial port interrupt.

7. Name any 4 additional hardware features available in 8051 when compared to microprocessor.

ROM ,RAM ,Parallel I/O , Serial I/O , Counters, and a clock circuit are available.

8. What is the function of DPTR register?

The data pointer register (DPTR) is the 16 bit address register that can be used to fetch any 8 bit data from the data memory space. When it is not being used for this purpose, it can be used as two eight bit registers , DPH and DPL.

9. What are the external hardware interrupts in 8051?

- INT0 - External hardware interrupt 0
- INT1 - External hardware interrupt 1

16-MARK QUESTIONS**UNIT I**

1. With neat block diagram, explain the architecture of 8086 microprocessor.
2. Draw and discuss the interrupt structure of 8086.
3. Explain the bus interface unit and execution unit of 8086 microprocessor.
4. Explain the register organization of 8086 processor in detail.
5. Explain any 8 addressing modes of 8086 processor with an example.

UNIT II

1. Explain the architecture of 8087 numeric data processor.
2. Draw the architecture of 8089 I/O processor and explain it.
3. Explain the Maximum and Minimum mode of operation of 8086.
4. Describe the architecture of 8089.
5. Explain the functions of an 8086 processor in the maximum mode.
6. Explain how the memory unit is addressed by 8086 with a neat diagram.

UNIT III

1. Draw the block diagram of a keyboard display controller and explain.
2. Explain in detail about the parallel communication interface.
3. Explain the operating modes of 8253 timer.
4. Write a program to interface LED and LCD displays with 8086 Microprocessor.

UNIT IV

1. Draw the data memory structure of 8051 microcontroller and explain.
2. Draw the functional block diagram of 8051 microcontroller and explain each block.
3. Draw the pin diagram of 8051 Microcontroller and explain the Input /Output lines in detail.
4. Draw the architectural block diagram of 8051 microcontroller and explain.

UNIT V

1. How to interface an LCD display with microcontroller? Explain how to display a character using LCD display.
2. Explain the interrupt structure of 8051 microcontroller with suitable diagrams.
3. Discuss briefly about keyboard/display controller.
4. Write brief notes on ADC and DAC along with their interface details.