M.Sc. - PHYSICS

Course Code: MSCPH-08

Memory Devices and Microprocessors

Very Short Answer Type Questions

Q.1: Define Microprocessor?

Answer 1: 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 those instructions, and provides as output.

Q.2: What is microcontroller?

Answer 2: Microcontroller is a Device that includes microprocessor, memory and I/O signal lines on a single chip, fabricated using VLSI technology.

Q.3: List the main applications of 8 bit microprocessors?

Answer 3: 8 bit microprocessors is used in a variety of applications such as appliances , automobiles ,industrial process and control applications.

Q.4: Write the uses of microprocessors in Medical Instrumentation field?

Answer 4: Patient Monitoring in Intensive Care Unit, Pathological Analysis and the measurement of parameters like blood pressure and temperature.

Q.5: List the limitations of 8 bit microprocessor:

Answer 5: Lower Execution Speed

It can address less memory size

Few instructions are available

Q.6: What is meant by key bouncing?

Answer 6: Microprocessor must wait until the key reach to a steady state; this is known as Key bounce.

Q.7: What is swapping?
Answer 7: The procedure of fetching the chosen program segments or data from the secondary storage into the physical memory is called 'swapping'.

Q.8: List the four operations commonly performed by MPU(Micro processing Unit)?
Answer 8: Memory Read : Reads data (or instructions) from memory.
Memory Write: Writes Data (or instructions) into memory.
I/O Read: Accepts data from input devices.
I/O Write: Sends data to output devices.

Q.9: Write about RST pins in 8085?
Answer 9: In 8085 ,three RST pins are available, such as RST 7.5 ,RST 6.5 , RST 5.5 RST represents Restart Interrupts. These are vectored interrupts that transfer the program control to specific memory locations. They have higher priorities than the INTR interrupt. Among these three, the priority order is 7.5,6.5,5.5.

Q.10: What is the use of 8251 chip?
Answer 10: 8251 chip is mainly used as the asynchronous serial interface between the processor and the external equipment.

Q.11: What is a control flag?
Answer 11: The bits D8 and D9 namely, trap flag (TF) and interrupt flag (IF) bits, are used for controlling machine operation and thus they are called control flags.

Q.12: Compare the 8 bit microprocessors 8080A and 8085.
Answer 12: 8080A is the predecessor of 8085. 8085 has the instruction set of 8080A plus some additional ones. Program written for 8080A will be executed by 8085. 8085 and 8080A are not pin compatible. Both require a +5V power supply.

Q.13: What is 8279?
Answer 13: The 8279 is a programmable Keyboard/Display interface.

Q.14: Define Immediate Addressing.
Answer14: 8 bit or 16 bit immediate data follows the instruction. For e.g MOV AX,5020H instruction transfers a word 5020H to the AX register .

Q.15: Define Direct Addressing mode :

Answer 15: A 16 bit offset address of the data memory location is specified with reference to the DS segment starting address. For.E.g MOV [1020H],5020H instruction transfers a word 5020H to the data memory location at 11020H if DS=1000H.

Q.16: List the major components of the keyboard/Display interface.

Answer 16: a. Keyboard section b. Scan section c. Display section d. CPU interface section

Q.17 : What is the purpose of carry (c) flag and zero (z) flag?

Answer 17: Carry flag holds the carry after addition or the borrow after subtraction. The carry flag also indicates error conditions, as dictated by some programs and procedures. The Zero flag shows that the result of an arithmetic or logical operation is zero. If Z=1, the result is zero; if Z=0, the result is not zero.

Q.18: What is 16-bit ISA? Compare it with 8-bit ISA bus.

Answer 18: The only difference between the 8 and 16-bit ISA bus is that an additional connector is attached behind the 8-bit connector. 16-bit ISA card contains two edge connectors. One plugs into the original 8-bit connector and other plugs into the 16-bit connector.

Q.19: What is a data amplifier?

Answert19: Transceivers are the bi-directional buffers are some times they are called as data amplifiers. They are required to separate the valid data from the time multiplexed address data signal. They are controlled by 2 signals i.e DEN & DT/R.

Q.20: Write the function of crossbar switch?

Answer 20: The crossbar switch provides the inter connection paths between the memory module and the processor. Each node of the crossbar represents a bus switch. All these nodes may be controlled by one of these processors or by a separate one altogether.

Short Answer Type Questions

Q.1 Compare memory mapped I/O with I/O mapped I/O.

Q.2 Compare Microprocessor and Microcontroller.

Q.3 What do you mean ‘ Data Width’?

Q.4 Draw and specify the complete bit configuration of 8085 flag Register?

Q.5 List the control and status signals available in 8085.

Q.6 What are the limitations of 8085 MPU?

Q.7 Define Register Relative Addressing Mode.

Q.8 How DRAM’s are different from SRAM’s? Why DRAMs are said to employ address multiplexing?

Q.9 List the operation modes of 8255

Q.10 What are the modes used in display modes?

Q.11 What is the output modes used in 8279?

Q.12 Define scan counter?

Q.13 What are the signals used in input control signal & output control signal?

Q.14 What are the basic modes of operation of 8255?

Q.15 What is synchronous and asynchronous data transfer?

Q.16 What do you mean by A/D conversion?

Q.17 What is USB?

Q.18 Discuss the various types of memory devices that you are familiar with.

Q.19 Draw and explain the block diagram of programmable interrupt controller 8259.

Q.20 What do you mean by Macro? Discuss merits and demerits of Macro over procedures

Long Answer Type Questions

Q.1 (a) Draw the functional block diagram of IC 8255A and answer following questions.

(1) List the operating modes of IC 8255A.

(2) Discuss control word format.

(3) Specify the handshake signals and their functions if port A is set up as an output port in mode 1.

(4) Write initialization instructions for the 8255A to set up

- Port A as I/P port in mode 0.
- Port B as O/P port in mode 1.
- Port C upper as an O/P in mode 0.

Assume address of control word register as 83H. 07

(b) Write a detailed note on Interrupts of 8085.

Q.2 Discuss the following:

(i) Some features of Pentium series of microprocessors.

(ii) Virtual memory.

(iii) MMX Technology.

(iv) Graphics adapters.

Q.3 (a) Explain Memory Mapped I/O and Peripheral I/O and make the comparison between them.

(b) Explain the function of RIM and SIM instructions.

Q.4 (a) Write a detailed note on Memory Classification.

(b) Explain clearly the interrupt arrangement in 8085 microprocessor with appropriate diagram. How the interrupts are activated ? To which memory location an interrupt points ? How the priority is arranged ? How the interrupts can be cleared ?

Q.5 What is the function of 8254 Programmable Interval Timer? Discuss any one of its applications in detail.

Q.6 (a) With the help of simplified block diagram explain the internal architecture of 8255. How various sections can be addressed ?

(b) List the major components of the 8279 keyboard / display interface, and explain their functions.

Q.7 (a) Write a note on the 8251A programmable communication interface.

(b) List the major components of the 8259A interrupt controller , and explain their functions.

Q.8 (a) Using diagram illustrate logic pin out of the 8085 Microprocessor.

(b) Explain the timing diagram of the memory write cycle