Victoria University of Bangladesh

Department of Computer Science & Engineering

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Course Title: Microprocessor & Interfacing

Answer to the question no: 1 (b)

Ans: Draw 8085 pin configuration:

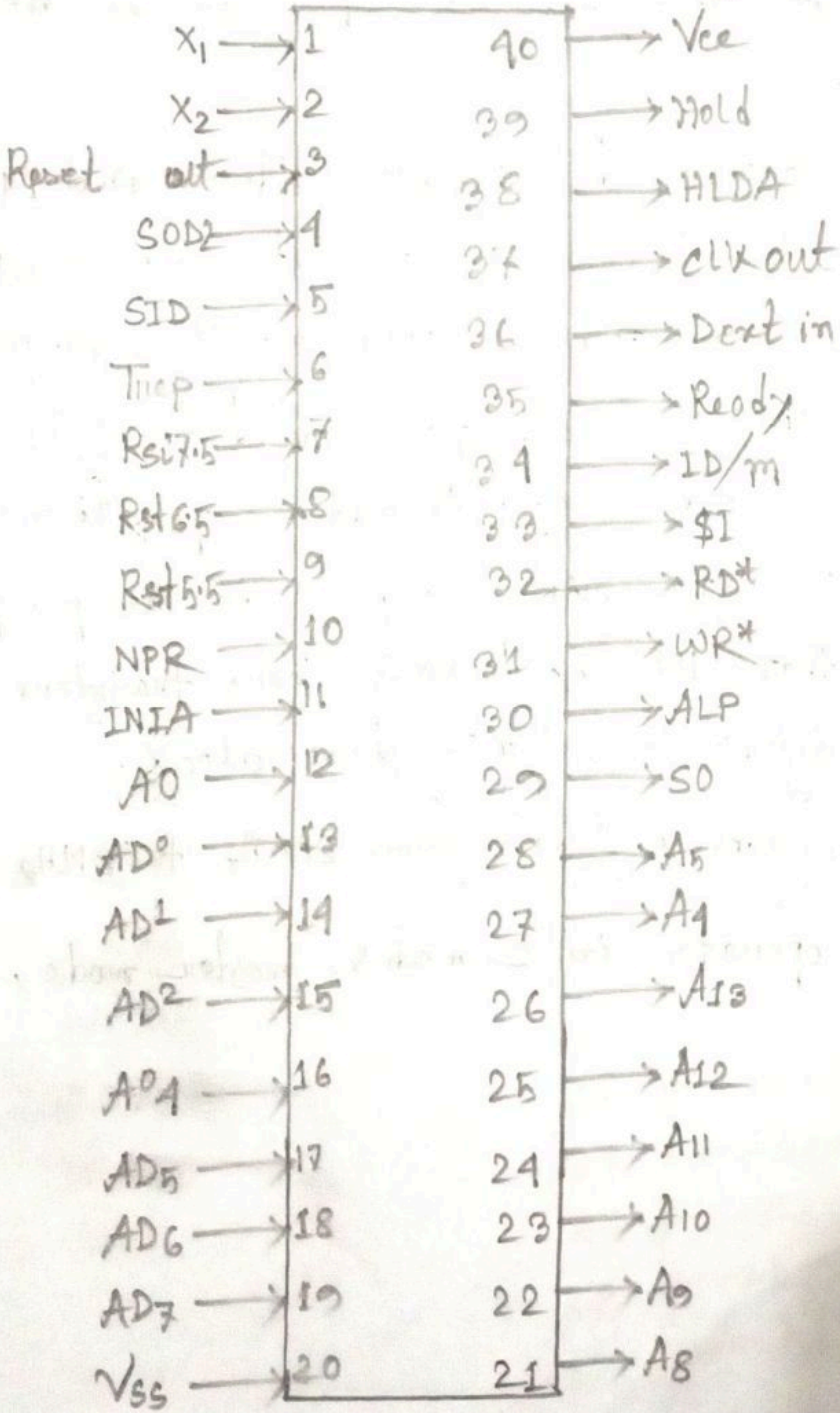


Fig. Pin diagram of 8085

Answer to the question no: 2(b)

Ans: 8257 Pin discription and Architecture:

(1) It has four channels which can be used over four I/O devices.
(2) Each channel has 16 bit address and 14 bit counts.
(3) Each channel can transfer data up to 64 kbit.
(4) Each channel can be programmed independently.
(5) Each channel can perform read transfer, write transfer and verify transfer operation.
(6) It generate MARK signal to the peripheral device that 128 by tes have been transferred.
(7) It requires a single phase clock.
(8) It's freqkency flones from 200 Hz to 3MHz.
(9) It operate in 2 modes, master mode, and solve mode.

P.T.O.

There are the main features of 8257 pin description These thinger are very important for any 8257 pin description:

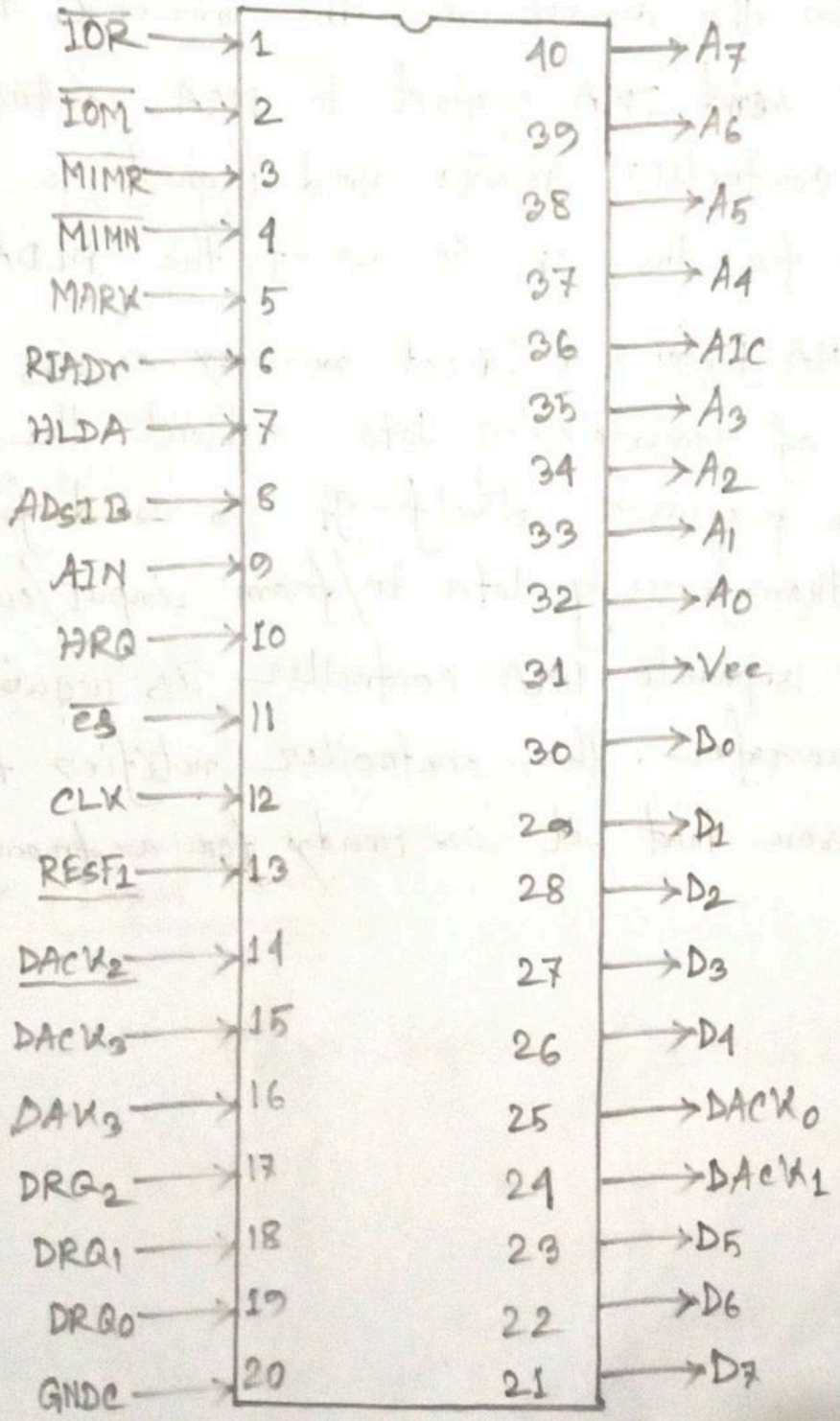


Fig. Pin diagram of 8257.

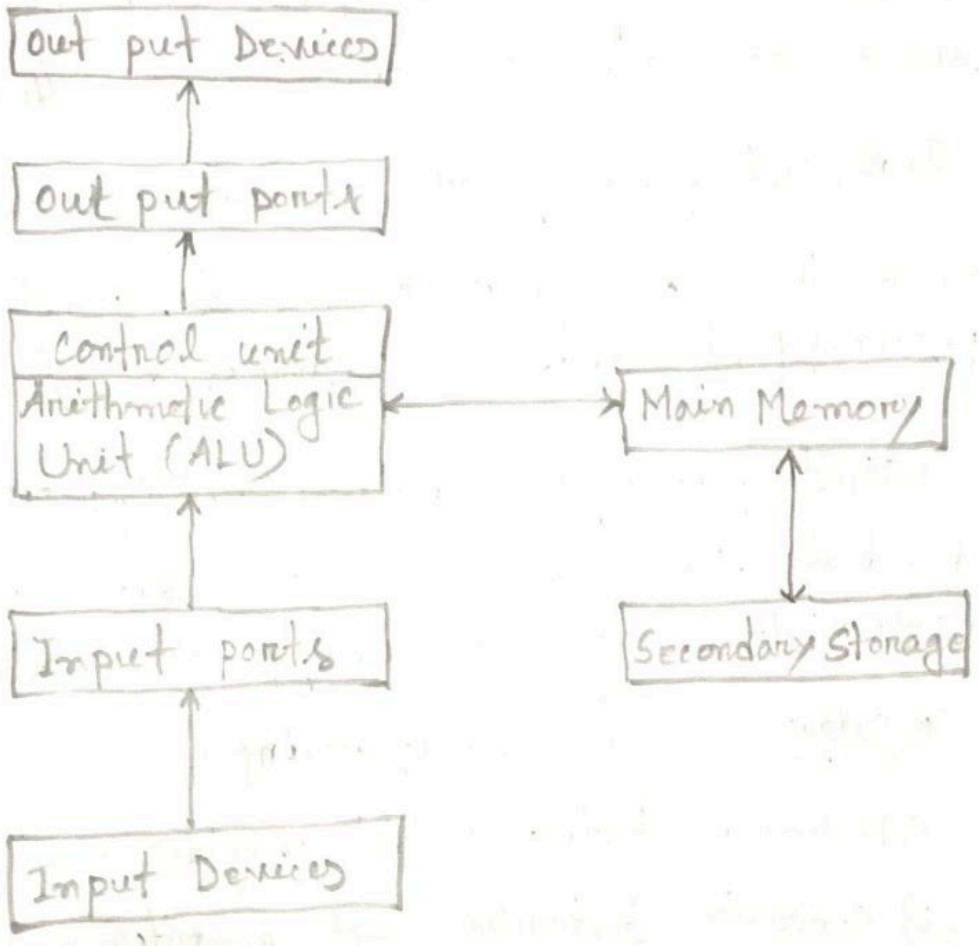
Answer to the question no: 2 (a)

Ans: Initially when any device has to send data between the device and the memory, the between has to send DMA reghert to DMA controler. The DMA controller genetes Hold reghest to the CPU and waits for the CPU to assert the HLDA.

#DMA Performed: Direct memory access (DMA) is the Process of transferring data without the involvement of the processor itself. It is ~~used for~~ often used for transferring data to/from input/output devices. A ~~sp~~ separate DMA controller is required to handle the transfer. The controller notifies the DSP processor that it is ready for a transfer.

Answer to the question no: 1 (a)

Ans: Block Diagram:



Block diagram of a computer.

P.t.o.

Features of Microprocessor:

(1) Architecture: Microprocessor are available is 8 bit, 16 bit, 32 bit, 64 bit architectures. The bit sizes can also be called bus width.

(2) Parallal processing: The multicore cheap that contains more than one processor in it, anables parallal processing at independent portions of a task.

(3) Multi processing and time searing: The time is devided in to several egal slices and it is alloted to various processing is a roler to lain fashion.

(4) Categonies of microprocessing:

(a) Fedreed Instraction set computer.

(b) Complain Instruction set computer.

(c) Special purpase processors.

Answer to the question no: 1 (c)

Ans: Define classification of Microprocessors: They are three types of microprocessors namely, CISC, RISC and EPIC.

A microprocessor is basically the brain of computer. We can also call it simply a processor or CPU. Furthermore, a microprocessor is basically a computer processor that is mounted on a signal IC. It means that all the functions of the processors are included on a single chip. Furthermore, the basic task of a microprocessor is to input the instructions from the memory, decode, and process them and produce the output. It performs three basic tasks while processing the information.

① CISC (Complex Instruction Set computer): The instructions are in a complex form. It means that a single instructions can contain many low-level instructions. For example, loading data form memory, storing data to the memory, performing basic operations, etc.

Example of CISC are Intel 386, Intel 486, Pentium, Pentium Pro, Pentium II, etc.

P.t.O.

(2) RISC (Reduced Instruction Set computer): The instructions are quite simple, and hence they execute quickly. Moreover, the instruction get complete in one clock cycle and also use a few addressing modes only.

Example: IBM RS6000, DEC Alpha 21064, DEC Alpha 21164.

(3) EPIC (Explicitly Parallel Instruction computing): It always the instructions to compute parallelly by making use of compilers. Furthermore, it encodes ~~in~~ the instruction is 128-bit bundels. Where is bundle contains three instructions encoded in 41 bits each and a 5-bit template. This 5-bit template contains informations about the type of instruction and that which instruction can be executed in parallel.

Example: IA-64 (Intel Architecture-64), etc.

Answer to the question no: 3(a)

Ans: Rotate Instructions:

The following instructions come under this category:

Instructions	Description
RCL	Rotate all bits of the operand left by specified number of bits through carry flag.
RCR	Rotate all bits of the operand right by specified number of bits through carry flag.
ROL	Rotate all bits of the operand left by specified number of bits.
ROR	Rotate all bits of the operand right by specified number of bits.

Shift Instructions: The following instructions come under this category

Instructions	Description
SAL or SHL	Shifts each bit of operand left by specified number of bits and put zero in LSB position.
SAR	Shift each bit of any operand right by specified number of bits. Copy old MSB into new MSB.
SHR	Shift each bit of operand right by specified number of bits and put zero in MSB position.

#Branch Instruction: The following instructions come under this category:

Instructions	Description
JA Or JNBE	Jump if above, not below, or equal i.e when CF and ZF = 0
JAE/JNB/JNC	Jump if above, not below equal or no carry i.e. when CF=0
JB/JNAE/JC	Jump if below, not above, equal or carry i.e. when CF=0
JBE/JNA	Jump if below, not above or equal i.e. when CF and ZF = 1
Jexz	Jump if cx register = 0
JE/JZ	Jump if zero or equal i.e. when ZF=1.
JG/JNLE	Jump if greater, not less or equal i.e. when ZF=0 and CF=OF.
JGE/JNL	Jump if greater, not less or equal i.e when SF=OF
JL/JNGE	Jump if less, not greater than or equal i.e. when SF ≠ OF.
JLE/JNG	Jump if less, equal or not greater i.e. when ZF=1 and SF ≠ OF
JMP	Causes the program execution to jump unconditionally to the memory address or label given in the instruction.

CALL	Calls a procedure whose address is given in the instruction and saves their return address to the stack.
RET	Returns program execution from a procedure to the next instruction or main program.
IRET	Return program execution from an interrupt service procedure to the main program.
INT	Used to generate software interrupt at the desired point in a program.
INTO	Software interrupts to indicate overflow after arithmetic operation.
LOOP	Jump to defined label until CX=0
LOOPZ/ LOOPE	Decrement CX register and jump if CX≠0 and ZF=1
LOOPNZ/ LOOPNE	Decrement CX register and jump if CX≠0 and ZF=0

Here, CF = Carry Flag
ZF = Zero Flag
OF = Overflow Flag
SF = Sign Flag
CX = Register.

Answer to the Q no: 3(b)

Ans: Memory Interfacing: When we are executing any instruction, we need the microprocessor to access the memory for reading instructions' codes and the data stored in the memory. For this both the memory and the microprocessor requires some signals to read from and write to register.
The interfacing process includes some key factors to match with the memory requirements and micro-processor signals. The interfacing circuits therefore should be designed in such a way that it matches the memory signal requirements with the signal of the microprocessor.

#I/O Interfacing:-

There are various communication devices like the keyboard, mouse, printer etc. So, we need to interface the keyboard, and other devices with the micro-processor by using latches and buffers. This type of interfacing is known as I/O interfacing.