Define interrupts.

Ans:

An interrupt is used to cause a temporary halt in the execution of Program.

* 8086 MicroProcessor ত interrupt Pin আছে ৩টা

Pin 17 ⇒ NMI [Non Maskable Interrupt]
Pin 18 ⇒ INTR [
Pin 24 ⇒ INTA

* NMI হল edge triggered input.
* INTR হল Interrupt Request Signal.
* INTA দ্বারা হয় interrupt acknowledgement

Draw Micro-Computer Operation timeline

Ans:

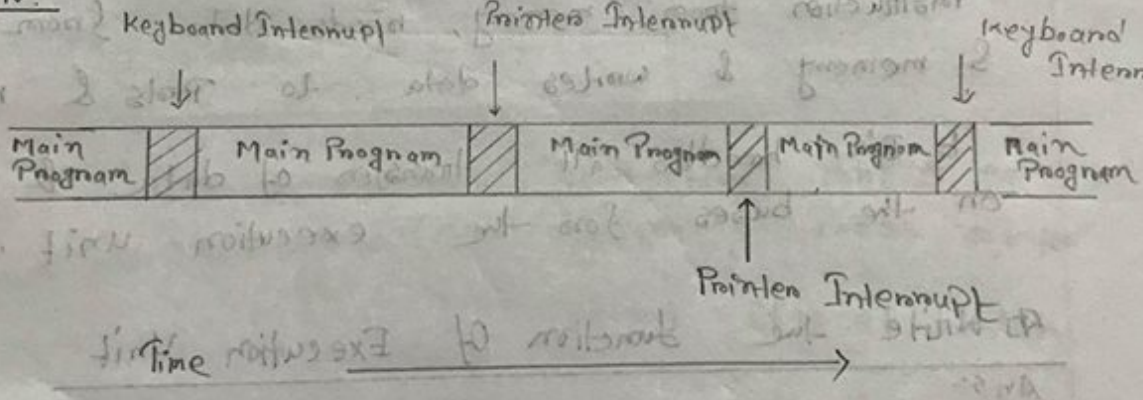
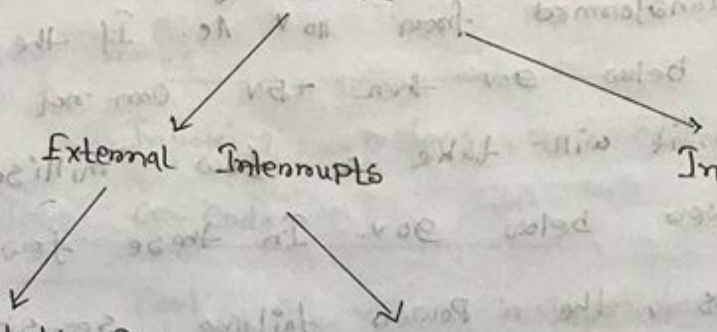


Fig: Micro-Computer Operation Timeline Showing interrupts

Interrupt I/O কয় ভাগে বিভক্ত?



~~Maskable Interrupt~~

External Interrupts → External হলো initiate করার জন্য use করা।

Write about maskable & non maskable interrupt

Ans:

Maskable:

Maskable interrupts can be enabled or disabled by instructions. Example: Mouse-Click

Non maskable:

Non maskable interrupts can not be enabled or disabled by instructions. Example: Power failure interrupt.

* 8086 → Total 256 টা interrupt

Describe Power failure interrupt.

Ans:

Micro-Processor normally use +5V which is transformed from 110 V Ac. If the voltage droops below 90V then +5V can not be maintained. However, it will take a few milliseconds to droop Power below 90V. In these few ~~seconds~~ miliseconds, the Power failure sensing circuit can interrupt the micro-Processor. An interrupt Service routine can be written to store Critical data in non volatile memory.

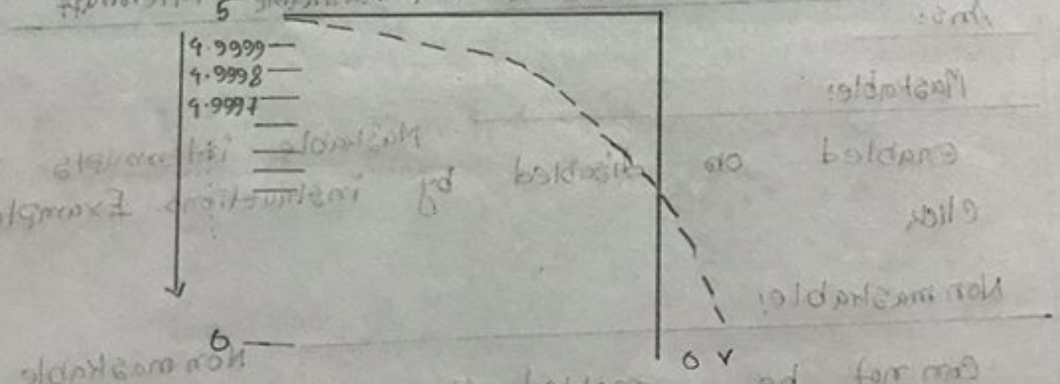


Fig: Power failure

* 8086 → MHz.

5×10^6 cycle second

1 টি cycle complete করতে সময় লাগে = 5×10^{-6} s

= 5 μs

* Information → Primary Memory → [Volatile Memory]
* Hard - disk → Non - ~~Vola~~ Volatile

Define invoke.

Ans:

Invoking refers to calling a method.

Define Op-code

Ans:

Part of the instruction that specifies the operation to be performed by the instruction.

* Processor → RAM & ROM কে access করতে পারে,
* Processor → Secondary Memory access করতে পারে না,

Define DMA

Ans:

DMA is a type of I/O technique in which data can be transferred between micro-Computer memory & an external device such as the hard disk, without micro Processor involvement.

* DMA → DMA Controller Chip 8237 ব্যবহার করে থাকে.

* ধরি DVD drive memory access করতে চায়,
তাহলে
DVD drive → DMA Controller কে বলবে আমি memory access চাই।
DMA Controller → CPU কে বলবে Permission এর জন্য, CPU বলতে [CPU Controller]
→ এই memory আসে RAM.

* Micro-Processor idle থাকবে না তার নিজস্ব memory থাকবে না,

* 8086 এর Pin 30 এবং 31 হল DMA Controller এর জন্য.

← 31 Hold
→ 30 HLDA

DR → Request পাঠায়
BG → Request Accept করে

Draw DMA Programmed I/O transfer diagram

Ans:

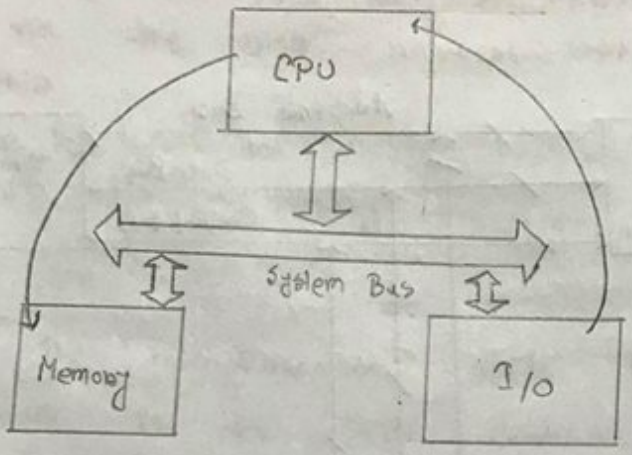


Fig: Programmed I/O transfer

Draw DMA transfer diagram.

Ans:

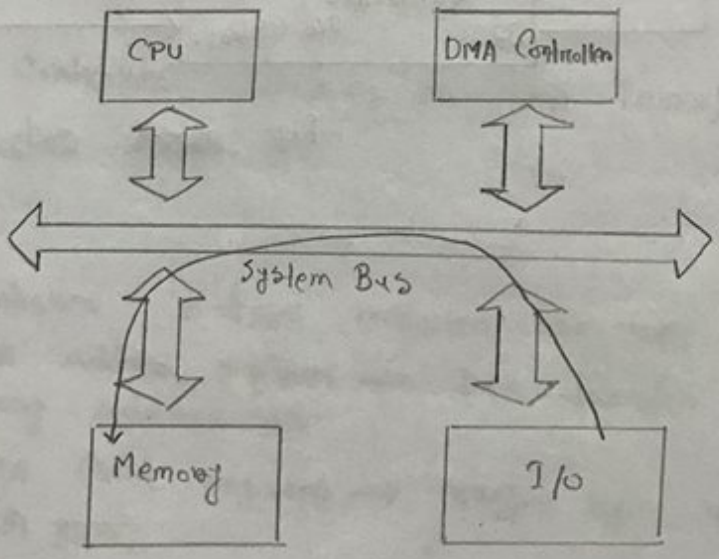


Fig: DMA Transfer

Q. Draw DMA decay diagram.

Ans:

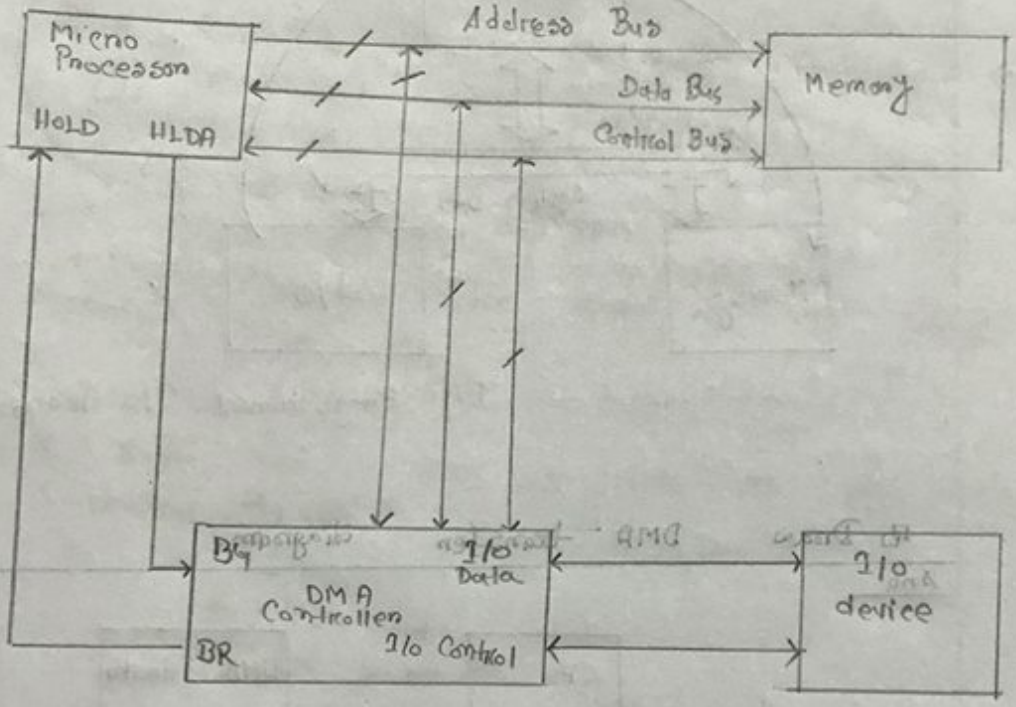


Fig: DMA Controllen chip 8237

Describe DMA operation shortly

Ans:

a. The I/O devices request DMA operation via the DMA request line of the Controller chip.

b. The Controller chip activates microProcessor HOLD Pin, requesting the microProcessor to release the bus.

C. The microProcessor sends HLDA (hold acknowledge) back to the DMA Controller, indicating that the bus is disabled. The DMA Controller places the memory address on the address bus & sends a DMA acknowledgement to the PeriPheral device.

d. DMA Controller Completes the DMA transfer & release the buses.

* DMA Controller ৩ ধরনের register use করে.
  => DMA address register → Data transfer এর জন্য memory address রাখে
  => DMA Count register → কতগুলো byte data আদান-প্রদান করা হবে,
  => DMA Control register → CPU থেকে Command receive করে,

* DMA তিনটা mode এ কাজ করতে পারে,
  (i) Burst
  (ii) Cycle Stealing
  (iii) Transparent

Burst → Total file Transfer না হওয়া পর্যন্ত system bus release করবে না।

* Burst এ faster transfer হয়, কিন্তু micro-Processor এর জন্য inefficient হয়।

* Burst এ I/O slow হয়ে যায়।