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Computer Architecture and Organization
Additional Assessment
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Question 1

Introduction:
A Microprocessor is an Integrated Circuit with all the functions of a CPU however, it cannot be used standalone since unlike a microcontroller it has no memory or peripherals. 8086 does not have a RAM or ROM inside it. However, it has internal registers for storing intermediate and final results and interfaces with memory located outside it through the System Bus.

In case of 8086, it is a 16-bit Integer processor in a 40 pin, Dual Inline Packaged IC. The size of the internal registers present within the chip indicate how much information the processor can operate on at a time in this case 16-bit registers and how it moves data around internally within the chip, sometimes also referred to as the internal data bus.

8086 provides the programmer with 14 internal registers, each 16 bits or 2 Bytes wide.

Sub-topics:

1. Bus Interfacing Unit (BIU)
2. Execution Unit (EU)

Description:

Bus Interfacing Unit (BIU)

- It provides the interface of 8086 to external memory and I/O devices.
- It operates with respect to bus cycles (machine cycles). This means it performs various machine cycles such as memory read, I/O read etc. to transfer data with memory and I/O devices.
- BIU performs the following functions-
    - It generates the 20 bit physical address for memory access.
    - It fetches instruction from memory.
    - It transfers data to and from the memory and I/O.
    - It supports pipelining using the 6 byte instruction queue.

Execution Unit (EU)

- It fetches instructions from the Queue in BIU, decodes and executes them.
- It performs arithmetic, logic and internal data transfer operations within the microprocessor.
- It sends request signals to the BIU to access the external module.
- It operates with respect to T-stats (clock cycles) and does not depend upon which machine cycle is being performed by the BIU.

Conclusion:
From this video I learned about Microprocessors. The 8086 Microprocessor- Internal Architecture. The Intel 8086 is a 16-bit microprocessor intended to be used as the CPU in a microcomputer. The term "16-bit" means that its arithmetic logic unit, internal registers, and most of its instructions are designed to work 16-bit binary words.

The architecture of 8086 is divided into two functional parts these two units work asynchronously. Functional division of architecture speeds up the processing, since BIU and EU operate parallel and independently, EU executes the instructions and BIU fetches another instruction from the memory simultaneously.

Question 2:

Introduction:
Control unit, arithmetic logic unit and memory are together called the central processing unit or CPU. Computer devices like keyboard, mouse, printer, etc. The set of instructions or programs that make the computer function using these hardware parts are called software.

Sub-topics:
1. Case
2. Motherboard
3. Power Supply
4. Graphics Card
5. Hard Drive
6. Ram
7. CPU

Description:
Case
The computer case is the metal and plastic box that contains the main components of the computer, including the motherboard, central processing unit (CPU), and power supply. The front of the case usually has an On/Off button and one or more optical drives.

Motherboard
The motherboard is an important computer component because it's what everything else connects to! The motherboard is a decently sized circuit board that lets other components communicate. A motherboard has ports that face outside a PC's case, so you can charge your computer and a computer's motherboard also contains slots for expansions, so you can add additional accessory ports if you wish.

Power Supply
The power supply powers all other components of the machine. It usually plugs into the motherboard to power the other parts. The power supply connects to either an internal battery (on a laptop) or a plug for an outlet (on a desktop).

Graphics Card
A Graphics Processing Unit (GPU) is a chip or electronic circuit capable of rendering graphics for display on an electronic device.

Hard Drive
RAM is temporary, in computer needs a place to store data permanently. That's where the hard drive comes in. The traditional hard drive consists of several spinning platters with an arm that physically writes data to the disk. However, these drives are slow and are starting to be replaced by the faster solid-state drives.

Ram (Random-access Memory)
RAM is temporary memory. Whenever you open up a Microsoft Word window, your computer places it in RAM, and when you close the window, that RAM is freed. Since RAM is volatile, its contents are lost if the machine loses power. This is why you lose a Word document when the power goes out if you didn't save it.

CPU (Central Processing Unit)
A CPU, sometimes referred to as a computer's brain, is the workhorse of the machine. It performs the calculations needed by a system, and can vary in speed. The work that a CPU does generates heat, which is why your computer has a fan inside. A more powerful CPU is necessary for intense computer work like editing high-definition video or programming complex software.

Conclusion:
A basic computer has at least 7 basic components which include a computer case or tower, motherboard, Central Processing Unit (CPU), Power Supply Unit (PSU), Random Access Memory (RAM), hard drive (HDD), Graphic Processing Unit (GPU) and some type of optical drive which would be your CD/DVD drive.