Typical Configuration of Computer System

One Mark Questions

Question 1. What is a motherboard?
Answer: The motherboard is a large printed circuit board and every physical unit is connected to it. It is the main circuit board of the computer system.

Question 2. What is microprocessor?
Answer: It is a program-controlled semiconductor device (IC), which fetches, decode and executes instructions.

Question 3. What is the purpose of registers in the CPU?
Answer: The registers are high-speed temporary storage (memory) of CPU. It is CPU's working memory and uses to store data and instructions during program execution.

Question 4. How does the computer communicate with other devices?
Answer: The ports are used to connect external devices like printers, keyboards or scanners and interface with the computer.

Question 5. What is system bus?
Answer: It is an internal bus that connects major components like processor, memory and I/O. The data transfer takes place in high speed.

Question 6. What is the function of control bus?
Answer: The control bus is used for transmission of control signals to coordinate the operations of various units of the computer.

Question 7. What is a data bus?
Answer: A set of wire is connected between the control unit and other units like memory, Input/ Output device.

Question 8. What is a port?
Answer: The port is a buffered I/O, which is used to hold the data transmitted from the microprocessor to I/O device or vice-versa.

Question 9. What is an interface?
Answer: An interface is provided between the system bus and I/O devices to match the slow I/O devices with the speed of the microprocessor.

Question 10. Expand PCI.
Answer: Peripheral Component Interconnect.

Question 11. How many bits of data are sent in a serial port?
Answer: The serial port can transfer data serially on bit at a time.

Question 12. Expand USB.
Answer: Universal Serial Bus

Question 13. Give one feature of a USB port.
Answer: The data speed of the USB port is 12 megabits per second.

Question 14. What is meant by plug and play device?
Answer: Plug-n-play device means devices can be inserted or removed into the computer system while the system is switched ON and working.

Question 15. Name any one USB device.
Answer: Pen drives/Printers/Mouse are one of the USB devices.

Question 16. Is device controller a hardware or software?
Answer: The device controller is a hardware.

Question 17. What is cache memory?
Answer: It is a small, fast memory that exists between the main memory and the CPU.

Question 18. Where is L1 cache located?
Answer: The cache that comes with the (CPU) processor called Level one (L1) cache.

Question 19. Where is L2 cache located?
Answer: The L2 cache is located near the motherboard(RAM).

Question 20. Expand SDRAM.
Answer: The expansion of SDRAM is Synchronous Dynamic Random Access Memory.

Question 21. Give the expansion of DDRRAM.
Answer: The expansion of DDRRAM is Double Data Rate Random Access Memory.

Question 22. Expand SMPS.
Answer: The term SMPS is expanded as Switch Mode Power Supply.

Question 23. What is the use of SMPS?
Answer: The SMPS gives controlled regulated converted DC power to all the units of computer.

Question 24. What is the approximate power consumed by a PC?
Answer: The approximate power consumed by a PC (Computer) is around 300 Watts.

Question 25. Expand UPS.
Answer: The expansion of UPS is Uninterruptable Power Supply.

Question 26. What is the use of UPS?
Answer: The UPS give power supply during the outage of main power supply to the computer.

Question 27. List the types of UPS.
Answer: The two types of UPS are Standalone UPS (offline UPS) and online UPS.

Question 28. What is the function of ALU?
Answer: The ALU performs all arithmetic and logic operations on the data.

Question 29. What is the function of Control unit in CPU?
Answer: The CU is said to be the nervous system of computer and it controls the overall operations of the computer.

Question 30. What is the purpose of registers?
Answer: The registers are high-speed temporary storage units within the CPU. Its main purpose is to store data and instructions during processing by the CPU.

Question 31. Name the two types of storage unit.
Answer: The two types of storage units are primary memory and secondary memory.

Question 32. Give examples for primary memory.
Answer: The RAM and ROM are examples for primary memory.

Question 33. Give examples for secondary memory.
Answer: Magnetic disks, Magnetic tape, optical disks are the examples for secondary memory.

Question 34. Expand the term ATX motherboard.
Answer: The term ATX motherboard expansion is Advanced Technology extended motherboard.

Question 35. Expand the term BIOS.
Answer: The expansion of BIOS is Basic Input Output System.

Question 36. What is the purpose of BIOS?
Answer: BIOS is a small chip that holds a set of instruction to load the hardware

settings required to activate basic components of computer like keyboard, monitor, etc.,

Question 37. Which program of BIOS stores the operating system into the memory?
Answer: The BIOS invoke bootstrap loader to load the operating system into the memory as soon as computer is switched on.

Question 38. Expand the term CMOS.
Answer: The expansion of CMOS is Complementary Metal Oxide Semiconductor.

Question 39. What is the purpose of CMOS?
Answer: The CMOS memory chip store the date, time and system setup parameters.

Question 40. What are slots in a motherboard?
Answer: The slots are opening in a motherboard where add on printed circuit board (PCB) are inserted.

Question 41. Name any two expansion slots.
Answer: The two expansion slots are ISA and PCI.

Question 42. Expand PCI.
Answer: The PCI is expanded as Peripheral Component Interconnect.

Question 43. Expand ISA.
Answer: The ISA is expanded as Industry Standard Architecture.

Question 44. What are disk controllers?
Answer: The disk controllers are the circuit that enables the CPU to communicate with hard disk, floppy disk, etc.,

Question 45. Name the interface that enables to read and write information to the hard drive.
Answer: The Hard disk controller is the interface that enables to read and write information to the hard drive.

Question 46. Expand the term IDE.
Answer: The IDE expansion is Integrated Digital Electronics.

Question 47. Expand the term DVI.
Answer: The expansion of DVI is Digital Video Interface.

Question 48. What is the purpose of DVI?
Answer: The DVI port connects flat panel LCD monitor to high-end video graphic card of the system.

Question 49. Name the different bus of system or expansion bus.
Answer: The system or expansion bus consists of data bus, address bus and control bus.

Question 50. Name the different internal memory.
Answer: The different internal memory are registers, cache memory, and primary memory.

Two Marks Questions

Question 1. Name any two types of motherboard.
Answer: The two types of motherboard are XT and ATX motherboard.

Question 2. Mention any two characteristics of the motherboard.
Answer: The two characteristics of the motherboard are form factor and chipset & socket.

Question 3. Mention the components of the motherboard.
Answer: The different components of the motherboard are CPU processor, BIOS, CMOS, Slots, I/O ports, Bus, and Slots.

Question 4. Explain system bus.
Answer: This is a single computer bus that controls the transfers between the CPU, the main memory, and the input/output devices.

Question 5. What is data bus and address bus?
Answer:
1. The Databus:
A group of wire is connected between the control unit and other sections (Input/Output device). These are bi-directional (two direction).

2. Address bus:
A collection of wires connecting the CPU with main memory that is used to identify particular locations (addresses) in main memory. The address bus is unidirectional (one direction).

Question 6. What is the purpose of the expansion slot?
Answer: An expansion slot is an opening located inside a computer on the motherboard that allows additional boards to be connected to it. For example, to install a new video card in the computer we purchase a video expansion card and insert that card into the expansion slot.

Question 7. What is the purpose of AGP slot?
Answer: The AGP is an advanced port designed for Video cards and 3D accelerators

designed by Intel. AGP is to provide enhanced graphic accelerator cards, thus enhancing the picture quality of the screen.

Question 8. Name the different types of I/O ports.
Answer: The different I/O ports are serial port, parallel port, USB port, and AGP port, etc.,

Question 9. Explain serial port.
Answer: COM/Serial ports: [Component Object Model]
It is used for connecting communication devices like modems or mice. Serial ports provide the serial transmission of data of one bit at a time. There are two types namely, COM ports – 9 pin ports and 25- pin ports.

Question 10. Explain the parallel port.
Answer: Parallel ports are used to connect external input/output devices like scanners or printers. They provide parallel transmission of data, of 1 byte (8 bits) at a time. Parallel ports use 25 pin RS-232C.

Question 11. Explain USB port.
Answer:

- USB provide higher data transfer speed for Plug-n-play devices like keyboard, mice, scanners, printers, digital cameras, thumb drives, etc.,
- USB allows multiple devices as many as up to 127 to run simultaneously on a computer.

Question 12. What is meant by plug and play card?
Answer: These are devices that work with a computer system as soon as they are connected. The user does not have to manually install drivers for the device or even tell the computer that a new device has been added. Instead, the computer automatically recognizes the device, loads new drivers for the hardware if needed, and begins to work with the newly connected device.

Question 13. What is the purpose of ports and buses?
Answer: The port has either holes or a slot that matches the plug or card being connected into the port. A PS/2 port found on the back of computers that allows a keyboard and mouse with a PS/2 connector to be connected to the computer. The bus connects major components like processor, memory and I/O internally and also connects the different external devices and ports thus expanding the computers capabilities.

Question 14. Explain the instruction execution cycle.
Answer: The instruction execution cycle performs the following steps:
a. Instruction Cycle:

1. Instruction Fetch
2. Instruction Decode

1. Instruction Fetch:
The first step is to fetch the instruction to be executed. This is called Instruction Fetch operation. Execution of the program starts from the Program Counter Register (PC) which has the first instruction of the program. The contents of the PC are then transferred to the Memory Address Register (MAR) and a READ signal is sent to the memory and is read out and loaded into the Memory Data Register (MDR). Later, the contents of the MDR are transferred to the Instruction Register (IR).

2. Instruction Decode
In the instruction Decode operation, the Instruction Register (IR) determines the type of instruction and selects signals accordingly. It separates the operation part of instruction and is sent to the control unit and the address part is sent to MAR of the instruction.

b. In Execution cycle:
The decoded instruction is executed finally. Instruction Decoder generates microinstructions and the timing signals that control the various processing elements involved in executing the instruction.

Question 15. Explain the features of the XT motherboard.
Answer: The extended Technology motherboards are old model motherboards. Slot type processors, Low insertion Force (LIF) sockets, DIMM RAM slots and ISA slots with 12 pin power connectors can be seen. Example, P1, P2, and Pentium MMX processors.

Question 16. Explain the features of AT motherboard.
Answer: Advanced Technology motherboards has Pin Grid Array (PGA) socket, SDRAM slots, 20 pin power connector, PCI slots, and ISA slots. Example: motherboard for Pentium 3 processors.

Question 17. Explain the features of Baby AT motherboard.
Answer: It is the combination of XT and AT and has slot type processor sockets and also PGA processors sockets, SDRAM slots and DDRRAM slots, PCI slots and ISA slots, 12 pin and 20 pin power connectors and ports. Example: Motherboard for Pentium 3 and Pentium 4 processors.

Question 18. Explain the features of ATX motherboard.
Answer: Advanced Technology extended motherboards are comparatively latest boards with MPGA processor sockets, DDRRAM slots, PCI slots, primary and secondary IDE interfaces, SATA connectors, 20 pin, and 24 pin ATX power connectors and USB ports. Example, motherboard for P4, Dual-core, Core 2 Duo, Quad-core, i3, i5 processors, etc.,

Question 19. Explain dock speed of a processor.
Answer: It refers to the speed of the processor. The clock speed is measured in terms of MegaHertz (millions of pulse per second) or Gigahertz (billions of pulses per second). The clock speed ranges from 1000 MHz to 3000 GHz. It means in 1000 MHz clock speed processor, can perform approximately 1000 million instructions per second. The faster the clock speed, the faster the processing speed. Ex: 2.7 GHz processor, 3.0 GHz processor, etc,

Question 20. Write the function of northbridge.
Answer: The northbridge is an integrated circuit (IC) is responsible for communications between the CPU interface, AGP, and the memory. The Northbridge is directly connected to these components and acts like a "bridge" for the Southbridge chip to communicate with the CPU, RAM, and graphics controller. Today, the northbridge is a single-chip that is North of the PCI bus, however, early computers may have had up to three separate chips that made up the northbridge.

Question 21. Write the function of southbridge.
Answer: The Southbridge is an integrated circuit on the motherboard that is responsible for the. hard drive controller, I/O controller and integrated hardware such as sound card, video card if present on the motherboard, USB, PCI, ISA, IDE, BIOS, and Ethernet.

Three Marks Questions

Question 1. Explain the different components of the motherboard.
Answer:
1. Processor slot:
It is used to install the microprocessor. Different processors use different sockets or slots. Based on the type, there are two main types of slots
a. Socket 7:
Is a 321-pin socket for Pentium class CPUs – Pentium MMX, K5, K6, etc.,

b. Slot 1:
Pentium ll/lll CPUs use slot 1.

2. Basic Input Output System (BIOS):
It is a small chip on the motherboard that loads the hardware settings required to load various devices like keyboard, monitor, or hard disk drives.

3. Complementary Metal Oxide Semiconductor memory (CMOS):
It stores the date, time and system setup parameters. A small Lithium-Ion battery powers the CMOS as well as BIOS.

4. SMPS Power supply connectors:
A power supply unit Switch Mode Power supply (SMPS) converts 230 Volts AC to 5 to 12 V DC Volts and provide regulated power for the functioning of the various components. The wattage of SMPS is around 150 to 500 watts.

Question 2. Explain the characteristics of the motherboard.
Answer: The characteristics of motherboard identifies different kinds of motherboards, including Physical characteristics, which in combination are called the form factor like XT, AT Baby AT and ATX motherboard; The chipset used, which defines the capabilities of the motherboard such as an AMD, Intel, NVidia, SiS, or VIA chipset; The processors the motherboard supports; Different processors use different sockets or slots. Based on the type, there are two main types of slots
a. Socket 7:
Is a 321-pin socket for Pentium class CPUs – Pentium MMX, K5, K6, etc.,

b. Slot 1:
Pentium ll/IH CPUs use slot 1

The BIOS it uses – System BIOS is a chip located on all motherboards that contain instructions and set up for how your system should boot and how it operates. The phoenix and AMI are the two BIOS manufacturers and the internal and expansion buses that it supports.

Question 3. Explain the general structure of a processor.
Answer:
1. General structure of CPU:
The CPU is the brain of a computer. Its primary function is to execute/run the programs. Under its control, programs and data are stored in the memory and displayed on the monitor (CRT screen) or printed on the printer. The CPU consists of Arithmetic and Logic unit, Timing and Control Unit, Accumulator, General, and special-purpose registers.
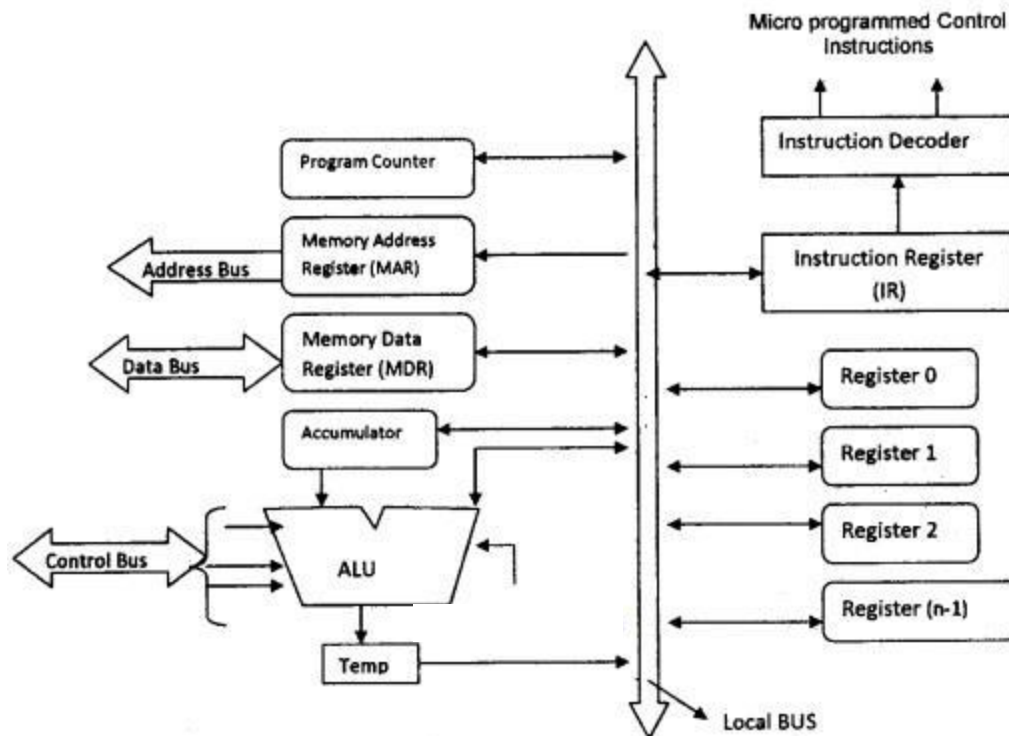
2. Program Counter Register (PC):
The PC points to memory location that holds the next instruction to be executed;

3. Memory Address Register (MAR):
it holds address of the active memory location loaded from the program counter register. The CPU transfers the instruction location from PC to MAR. From MAR it is sent to the memory through the address bus.

4. Memory Buffer Register (MBR) or Memory Data Register (MDR):
It contains data of memory location specified by MAR for the purpose of storing or to retrieve. It is connected to data bus. The flow of data from the CPU to the memory or from the memory to CPU is always through MBR.

5. Arithmetic and Logic Unit (ALU):
The function of an ALU is to perform arithmetic operations such as +, -, *, /, ^ and logic operations such as AND, OR, NOT, ++, —, >, >=, <, <=, != (not equal) etc.,

6. Accumulator Register (AR):
The accumulator usually stores one of the operands to be manipulated by the ALU. The accumulator is an 8-bit register. It holds one of the operand to be operated on by the ALU and receives the result of an operation done by the ALU. In general, the accumulator is both a source (operand) and a destination (result) register.

7. Instruction Register (IR):
It holds the instruction currently being executed and until decoded. It separates the operation part of instruction and is sent to the Control unit and the address part is sent to MAR of the instruction.

8. Instruction Decoder (ID):
It is an electronic hardware, which decodes the instruction and they are further divided into a set of micro-operations.

9. Timing and Control Unit (TCU):
It generates timing and control signals necessary for the execution of instructions. It provides status, control and timing signals necessary for the operation of other parts of the CPU, memory and I/O devices. It controls the entire operation of the computer.

Question 4. Explain different types of I/O ports.
Answer: The different I/O ports are serial port, parallel port, USB port, and AGP port, etc.,
1. COM/Serial ports: [Component Object Model]
It is used for connecting communication devices like modems or mice. Serial ports provide the serial transmission of data of one bit at a time. There are two types namely com ports – 9 pin ports and 25- pin ports.

2. Parallel ports:
Used to connect external input/output devices like scanners or printers. They facilitate the parallel transmission of data, of 1 byte (8 bits) at a time. Parallel ports use 25 pin RS- 232C.

3. Universal Serial Bus {USB) connectors:

USB provides high-speed data transfer for Plug-n-play devices like keyboard, mice, scanners, printers, digital cameras, thumb drives, etc.,

The data transfer speed in USB 1.0 is 12 Mb per second, USB 2.0 is 480 Mb per second and USB 3.0 is 5 Gb per second.

USB allows multiple devices as many as up to 127 to run simultaneously on a computer.

The AGP is an advanced port designed for Video cards and 3D accelerators designed by Intel. AGP is to provide enhanced graphic accelerator cards, thus enhancing the picture quality of the screen.

4. PS/2 connectors:
Stands for "Personal System/2" (PS/2) are used to connect input devices like PS/2 keyboards or mice.

5. IDE drive connector:[lntegrated Drive Electronics]
IDE devices like Harddisk drives, CD-ROM drives are connected via a 40-pin ribbon cable.

Question 5. Give the features of the USB port.
Answer: Universal Serial Bus (USB) connectors:
Universal Serial Bus, USB is a standard that was introduced in 1995 by Intel, Compaq, Microsoft, and other computer companies. USB 1.x is an external bus standard that supports data transfer rates of 12 Mbps and is capable of supporting up to 127 peripheral devices.

USB 2.0, also known as hi-speed USB, is capable of supporting a transfer rate of up to 480 Mbps and is backward compatible, meaning it is capable of supporting USB 1.0 and 1.1 devices and cables. USB 3.0 also known as SuperSpeed USB is the latest version of the USB protocol.

Most new computers provide USB 3.0 ports built-in, offering data transfer speeds of up to five gigabits per second. USB provides high-speed data transfer for Plug-n-play devices like keyboard, mice, scanners, printers, digital cameras, thumb drives, etc.,

Question 6. Explain cache memory.
Answer:
a. Cache Memory:

1. It is a small, fast memory that exists between the main memory and the CPU.
2. It is much faster than the main memory (access time 10-20 ns).
3. There are two types of cache memory i.e., LI and L2 cache
4. L1 cache located with CPU and L2 cache located with RAM.
5. It stores instructions and data, which are to be immediately executed.
6. It is much costlier than the main memory.
7. The Cache Memory capacity is much less than the main memory
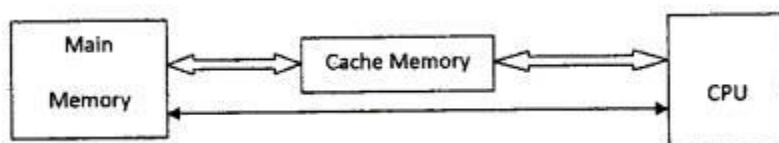
b. Working of Cache memory:
When the program is running, the CPU reads the data/instruction from RAM and

stores it in registers. At the same time, it also stores a copy of the data/ instructions in cache memory. The next time, if the CPU needs same data/instruction, it finds it in the cache memory. This helps to enhance the speed of instruction execution by CPU. There are two types of cache memory

1. Level one (L1) cache
2. Level two (L2) cache

1. Level one (L1) Cache:
The cache that comes with the (CPU) processor called Level one (LI) cache. This cache runs at the processor's clock speed and therefore is very fast. LI cache is further divided into two sections; one for data and other for instructions.

2. Level two (L2) cache:
It is a much slower cache, which is residing in motherboard (RAM) and delivers slower performance.

Question 7. Explain the types of power supply.
Answer: The power supply to computer can be categorised into two types. Namely, Switch Mode Power Supply (SMPS) and Uninterruptible Power Supply (UPS).
SMPS:
The switched-mode power supply acting as a DC to DC converter first rectifies an AC input voltage (240Volts), converts it to DC and, chops this DC in a "chopper" and converts it to a higher or lower level of DC (5 to 12 V DC Volts)or perhaps both a higher AND lower level of DC. Typical modern applications include computer power supply and the power supplies in TV and Video sets. The wattage of SMPS is around 150 to 500 watts.

SMPSs are three types.

1. AT SMPS
2. ATX SMPS
3. BTXSMPS

1. AT SMPS:
AT stands for Advanced Technology. These are all. old SMPSs. They had 12pin power connector, this is called an AT power connector. They were used in Pentium-1, Pentium- MMX, Pentium-ll and Pentium-Ill CPUs.

2. ATX SMPS:
ATX stands for Advanced Technology extended. They had a 20pin Power connector, this is called an ATX power connector. They were used in Pentium-Ill, Pentium-IV and AMD CPUs.

3. BTXSMPS:
BTX stands for Balanced Technology extended. They have a 24pin Power connector, this is also called an ATX power connector. It has 15pin SATA power connectors. They are used in Dual-core, core2duo, Quad-core, i3, i5, i7 and latest AMD CPUs.

4. Uninterruptible Power Supply (UPS):

- UPS unit give continuous power supply in the event of the main source power break.
- It also regulates the high and IQW voltage in power supply.
- On-line and Off-line UPS are the two kinds of UPS.
- They give different backup power ranging from 15 minutes to several hours.

UPS is Uninterruptible Power Supply, this is also known as power backup with battery. With UPS even the main power source down, this unit will always give power to computer. UPS have a limit time to give backup power, this depends on how big the UPS capacity.

5. Working of UPS:
With simple explanation inside UPS have battery with recharge module, it also have module to determine whether the main power source on or off, so when the main power source on, the recharge module will charge the battery till full. When the main power source suddenly off, then the module will switch on the battery changed into a backup power source.

Two types of UPS are Offline and Online UPS.
1. Offline UPS (standby UPS):
This UPS type have a module to switch between using battery or using bypass main power source. When the main power source is off, then the module will switch from the main power source to the battery source in less than 4ms delay time and supply power to the computer.

2. Online UPS
This UPS type is better than Offline because no matter the main power source is on or off, this Online UPS output always come from battery source. That's why this type of UPS does not have delay time when the main power source is off or on. The price for Online UPS is more expensive than Offline UPS.

Question 8. What is the purpose of ports, buses, and controllers in the I/O system?
Answer: The port has either holes or a slot that matches the plug or card being connected into the port. A PS/2 port found on the back of computers that allows a keyboard and mouse with a PS/2 connector to be connected to the computer.

The bus connects major components like processor, memory and I/O internally and also connects the different external devices and ports thus expanding the computers capabilities.

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5. IDE drive connector:[lntegrated Drive Electronics]
IDE devices like Harddisk drives, CD-ROM drives are connected via a 40-pin ribbon cable.

6. Floppy drive connector:
Used for connecting the floppy drive to the PC. It is a 34-pin ribbon cable.

Question 9. Give the typical configuration of a computer.
Answer: Standard Configuration of a PC

SI.No	Component	Specification
1.	Processor Name	INTEL P IV 3.00 GHz
2	Motherboard	INTEL 945G chipset Original Motherboard

3	RAM Size	2G B/4GB DDR RAM
4	Hard disk size	250/500 GB (Sata/Baracuda) having 7200 rpm
5	CD/DVD unit	CDROM – DVD combo drive
6	Monitor	15″ or 17″ Color CRT or TFT monitor
7	Floppy Disk Drive	1.44 MB FDD
8	Keyboard and Mouse	PS/2 compatible Multi-media Keyboard and Optical Mouse
9	Multimedia	Multimedia Speakers / or Headphone with mike
10	Cabinet	ATX cabinet having 500 watts SMPS unit.
11	Modem	Internal/External Modem
12	Printer	Inkjet/Laser Printer

Question 10. Write a short note on primary memory.
Answer:
1. Random Access Memory (RAM):
The main memory RAM size varies from 16 MB, 32 MB, 64 MB to 8 GB.
Features:

Fast Memo; EXpensive memory, small size memory, Volatile in nature i.e., data stored on it completely erased as and when the computer is switched off.

2. Different types of RAM's are:
a. Dynamic RAM (DRAM) – is the most common type of memory and is small and cheap but slow. It pair of transistors and capacitors makes the memory cell where transistors are arranged in matrix form and capacitors are used to hold 0 and 1 bits. DRAM must by refreshed continuously to retain data in memory with the help of refresher circuit.

b. Static RAM (SRAM) -normally uses 4 to 6 transistors to form the memory cell and takes more space on a chip. No capacitors are used and refreshing is not required. It is much faster than DRAM therefore used in cache memory.

c. Synchronous Dynamic RAM (SDRAM) – A special type of DRAM where synchronized to the system clock of the CPU thereby reduces CPU waiting time for data.

d. Double Data Rate RAM (DDRRAM) – is the same as SDRAM except data transfer rate is double the rate of SDRAM.

3. Read-Only Memory (ROM):
These are non-volatile fixed size memory usually supplied by manufacturers of

motherboards.
Types of ROM

- PROM – Programmable ROM
- EPROM – Erasable Programmable ROM
- EEPROM – Electrically Erasable Programmable ROM