Computer overview and its Basics

TOPIC-1
Computer and its Functioning

Very Short Answer Type Questions [1 mark each]

Question 1:
Which part interprets program instructions and initiate control operations ?
Answer:
Control unit.

Question 2:
What is primary memory ?
Answer:
Primary memory : This is the storage section of computer which is used to store data or instructions or both for processing purpose. This is non-volatile in nature.

Question 3:
What is RAM ?
Answer:
RAM : RAM stands for Random Access Memory.
This is the main memory of computer used to retain user's instructions and data for processing purpose. This is volatile in nature .

Question 4:
What is ROM ?
Answer:
ROM : ROM stands for Read Only Memory. ROM applies to semiconductor memory whose contents cannot be altered, once they have been set. So non-volatile in nature.

Question 5:
What is PROM ?
Answer:
PROM : PROM stands for Programmable Read Only Memory. A control memory in which stored contents can be altered once after they have been set.

Question 6:
What is EPROM ?
Answer:
EPROM : EPROM stands for Erasable Programm able Read Only Memory. It can be erased and

programmed with a special type of equipment. If it is exposed in ultraviolet light, it allows data to be erased and reprogrammed.

Question 7:
What is EEPROM ?
Answer:
EEPROM : EEPROM stands for Electrically Erasable Programmable Read Only Memory. This type of ROM can be erased and programmed with the help of electric pulse.

Question 8:
Give three examples of both input devices and output devices.
Answer:
Input Devices :

1. Keyboard
2. Mouse
3. Scanner

Output Devices :

1. Monitor
2. Speaker
3. Printer

Short Answer Type Questions – I [2 mark each]

Question 1:
Name the components of a computer system.
Answer:
The computer system consists of two parts :

1. Hardware.
2. Software.

Question 2:
Explain functional components of a computer system.
Answer:
A computer system contains many different objects such' as a CPU, memory, disks, etc. These all must be connected for the system to function.

Question 3:
Explain volatile and non-volatile memory.
Answer:
The memory is which data is lost when power is removed is called volatile memory. The memory is which data is not lost when power is removed is called non-volatile memory.

Question 4:
What are the basic units of computer ? Give two names of sub-units of CPU and also give the functions of each unit
Answer:
The computer consists of the following basic units :

1. Input unit
2. Central Processing Unit (CPU)
3. Output unit
4. Memory unit

The CPU has two sub units :
(A) Control Unit (CU) : Control unit controls the entire operation being carried out.
(B) Arithmetic Logic Unit (ALU) : It performs the
arithmetic and logical operations.

Question 5:
What is data ? What is the output of data processing system ?
Answer:
Data is derived from a word 'datum' i.e. a fact. Data is a collection of raw facts and figures. Data processing system is a computer based system which converts data into information.

Question 6:
What is the difference between data and information ?
Answer:
Data : Data means facts and figures. Data is unprocessed information. For example : Siddharth, 40400195, M.
Information : Information means what we get after processing data i.e., processed data. In other words, information is processed data.
For example :

NAME	ROLL NUMBER	GENDER
Siddharth	40400195	M

Question 7:
What is the function of memory ? What are the types of it ?
Answer:
The memory stores data temporarily or permanently.
Computer memory is of two types :

1. Primary Memory (Main Memory) : The primary or main memory holds the data and information during processing. It holds data temporarily, as we switch off computer the information vanishes.
   For example : RAM.
2. Secondary Memory : It can store data perma-nently on the computer but it cannot process data. It is meant for permanent storage of data and information.
   For example : CD-ROM, DVD-ROM.

Question 8:
What is a bit ? How bit, byte and nibbles are related to each other ?
Answer:
Bit (Binary Digit) : A bit is the smallest elementary unit of memory, which can store one binary signal either 0 or 1. A group of 8 bits is called a byte. A group of 4 bits is called a nibble.

Question 9:
What do you mean by Input Unit ? Give the examples of Input Unit.
Answer:
Input Unit : An input unit takes the input and converts it into binary form so that it can be understood by CPU for processing accordingly. For example : Keyboard, Mouse, Joystick, Scanner, Camera, Magnetic Ink Character Reader (MICR), Bar Code Reader (BCR) etc.

Question 10:
What is the function of CPU in a computer system ?
Answer:
The CPU is the control center for a computer. It controls, directs and manages the entire performance of the computer. The CPU has two different parts which are responsible for different functions.

Question 11:
What do you understand by IPO cycle ?
Answer:
IPO cycle refers to the Input Process Output cycle where every operation undergoes the phases namely input, process and output.

Question 12:
Differentiate between source program and object program.

Answer:

Source Program : A program which is written by the programmer in high level language or in assembly language, which is to be converted into machine language by the compiler is known as source program.

Object Program : The source program is converted into machine level instruction for execution. This converted program (in the machine language) is known as an object program.

Question 13:

Draw the labeled diagram, representing the basic structure of a computer system.

Answer:

Refer to Quick Review diagram to show Basic Computer System.

Question 14:

Mention any two limitations or weaknesses of a computer ?

Answer:

Any two limitations or weaknesses of a computer system are as follows :

1. Lack of intelligence/Lack of decision making power : No doubt, computer is a powerful machine but cannot decide on its own that what it is supposed to do as a machine. This is a serious limitation of a computer system and it is an artificially intelligent machine.
2. Need of special language : A computer can understand only the binary language, in which the information is represented in terms of only two symbols, namely 0 and 1. This is not the natural language of human beings and learning of the binary language is not an easy task.

Short Answer Type Questions – II [3 mark each]

Question 1:

Explain Primary Memory Unit.

Answer:

Memory Unit stores the data, instructions, intermediate results and output temporarily, during the processing of data. This memory is also called the main memory or primary memory of the computer. The input data that is to be processed is brought into the main memory before processing.

Question 2:

Explain what is a computer and write its advantage.

Or

Define computer. Give it's characteristics.

Answer:

A computer is an electronic device which can perform various operations correctly and fast. For example data processing, huge calculations etc. Characteristics of computer :

1. **Speed :** Its speed is very fast. A modern computer can execute millions of instructions in one second.
2. **Accuracy :** A computer can give accurate results up to 20 to 30 places of decimal.
3. **High storage capacity :** A computer can store large amount of data in very small space.
4. **Versatility :** A computer c3n do different types of tasks like data processing, graphics, audio and visual effects.
5. **Repetitive:** A computer makes no mistake in repeating anything as many times.

Long Answer Type Questions [4-5 mark each]

Question 1:
Explain four characteristics of computer.
Answer:
Speed, accuracy, diligence, storage capability and versatility are some of the key characteristics of a computer. A brief overview of these characteristics are :

1. **Speed :** The computer can process data very fast, at the rate of millions of instructions per second. Some calculations that would have taken hours and days to complete otherwise, can be completed in a few seconds using the computer.
2. **Accuracy :** Computer provides a high degree of accuracy. For example : the computer can accurately give the result of division of any two numbers up to 30 decimal places.
3. **Diligence :** When used for a longer period of time, the computer does not get tired or fatigued. It can perform long and complex calculations with the same speed and accuracy from the start till the end.
4. **Storage Capability :** Large volumes of data
and information can be stored in the computer and also retrieved whenever required. A limited amount of data can be stored temporarily in the primary memory. Secondary storage devices like DVD and compact disk can store a large amount of data permanently.

Question 2:
Compare human beings with computer.
Or
What is the difference between man and computer ?
Answer:
A computer is an electronic device which can process data to give meaningful information with the help of a set of instructions called 'Program'.
In computer, following are the advantages as compare to man :

1. It is faster as compared to human beings
2. It is more accurate in comparison to human being. "
3. It can store a huge amount of information that can be retrieved instantly as compared to the human beings.
4. It is immune to boredom and tiredness.

5. It is versatile, can do different types of work with same accuracy and speed.

A computer has following disadvantages :

1. A computer does not have its own intelligence that a man has.
2. A computer cannot work without power
   (electric or battery)

Question 13:
Expand the following terms :

1. CPU,
2. ALU,
3. VLSI,
4. MSI,
5. LSI,
6. SSI,
7. IC,
8. IPO,
9. HLL,
10. MB.

Answer:

1. CPU —> Central Processing Unit
2. ALU —> Arithmetic Logic Unit
3. VLSI —> Very Large Scale Integration
4. MSI —> Medium Scale Integration
5. LSI —> Large Scale Integration
6. SSI —> Small Scale Integration
7. IC —> Integrated Circuits
8. IPO —> Input Process Output
9. HLL —> High Level Language
10. MB —> Mega Byte

TOPIC -2
Generations And Evolution Of Computers Quick Review

Very Short Answer Type Questions [1 mark each]

Question 1:
Write the name of the first calculating device.
Answer:
Calculating machine ABACUS is not called a computer, it can almost be called a computer.

Question 2:
Write the name of first device for multiplication.
Answer:
Napier's Bone was a mechanical device built for the purpose of multiplication in 1617 A.D. by an English mathematician John Napier.

Question 3:
How many generations of computer exist ?
Answer:
There are five gem nations of computer.

Question 4:
What is the time period for first generation of computer ?
Answer:
First Generation is from 1940 to 1956 (used Vacuum Tubes).

Question 5:
What is the time period for second generation of computer ?
Answer:
Second Generation is from 1956 to 1963 (used Transistors).

Question 6:
What is the time period for third generation of computer ?
Answer:
Third Generation is from 1964 to 1971 (used Integrated Circuits).

Question 7:
What is the time period for fourth generation of computer ?
Answer:
Fourth Generation is from 1971 to present (used Microprocessors).

Question 8:
What difference does the 5th generation computer have from other generation computers ?
Answer:
Artificial intelligence.

Question 9:
Which computer language is used for artificial intelligence ?
Answer:
PROLOG.

Question 10:
The binary system uses powers of_____ ?
Answer:
2.

Question 11:
Who is known as the Father of Computers ?
Answer:
Charles Babbage is known as the Father of Computers.

Question 12:
Who was the first lady programmer ?
Answer:
Lady Ada Lovelace.

Question 13:
In which generation vacuum tubes were used ?
Answer:
Vacuum tubes were used in first generation computers.

Question 14:
In which generation transistors were used ?
Answer:
Transistors were used in second generation computers.

Question 15:
Who introduced the concept of punched cards ?
Answer:
Herman Hollerith introduced the concept of punched cards.

Question 16:
Name the machine developed by Blaise Pascal ?
Answer:
The machine developed by Blaise Pascal is Pascaline.

Question 17:
Expand ENIAC.
Answer:
ENIAC stands for Electronic Numerical Integrator And Computer.

Question 18:
Expand EDSAC.
Answer:
EDSAC stands for Electronic Delay Storage Automatic Computer.

Question 19:
Expand UNIVAC.
Answer:
UNIVAC stands for Universal Automatic computers.

Question 20:
Give two examples of fourth generation computers.
Answer:
Two examples of fourth generation computers are home computers and personal computers.

Short Answer Type Questions – I [2 mark each]

Question 1:
Why is analytical engine often called the pioneer computer ?
Answer:
The analytical engine was the first design to introduce the basic architecture of modern computer i.e., CPU storage area, memory & input/ output device. Therefore, it is called the pioneer computer.

Question 2:
Name the two machines proposed by Charles Babbage.
Answer:
The two machines proposed by Charles Babbage are :

1. Difference Engine
2. Analytical Engine.

Question 3:
When and who invented vacuum tubes ?
Answer:
Lee Dee Forest invented vacuum tubes in 1906.

Question 4:
Give the – classification of the mechanical calculating devices.
Answer:
Mechanical calculating devices can be classified into following categories :

1. Manual Calculating Devices.
2. Semi-automatic Calculating Devices.

Question 5:
Name two manual calculating devices.
Answer:
The two manual calculating devices are as follows:

1. ABACUS
2. Napier Bones.

Question 6:
Name any two semi-automatic calculating devices.
Answer:
Two semi-automatic calculating devices are as follows :

1. Pascaline.
2. Difference Engine.

Question 7:
What is ABACUS ? Explain.
Answer:
The ABACUS is a mechanical device which has a wooden frame. An ABACUS consists of beads divided into two parts which are movable on the rods in two parts. The device was used for doing calculations like addition, multiplication, etc. Chinese have been using ABACUS for large calculations. This device is still used for calculations in countries like China, Japan and Russia.

Question 8:
What are the advantages of vacuum tubes ?
Answer:
Vacuum tubes have the following advantages :

1. Vacuum tubes were the only electronic components available during those days which made possible the invention of electronic digital computers.
2. These computers were the fastest calculating devices of that time. They could perform computations in milliseconds.

Question 9:

When were the transistors developed ?

Answer:

Transistors were developed during second generation. A transistor is smaller and more reliable substitute to the vacuum tubes.

Transistor

Question 10:

Write a short note on Charles Babbage.

Answer:

Charles Babbage was a British mathematician. In 1833, he designed a mechanical computer known as Analytical Engine. The machine had the ability to handle large amount of data and process it at a high speed. Charles Babbage is known as the 'Father of Computers' because he introduced the idea of storing and reading information before processing.

Question 11:

Write a short note on Lady Ada Lovelace.

Answer:

The Lady Ada Lovelace was the daughter of the famous poet Byron. She is known as the 'First Lady Computer Programmer' in computer history. The concept of instructions given to Analytical Engine in the form of 0's and l's was given by her.

Question 12:

Write a short note on Pascal's Adding Machine.

Answer:

In 1692 Blaise Pascal, a Frenchman, invented a calculating machine called Pascaline. The machine was made up of gears and was used for adding numbers quickly. He was credited for building the first mechanical calculating machine. The design of his machine was ahead of its time.

Question 13:
What are the disadvantages of third generation computers ?
Answer:
The disadvantages of third generation computers are as follow :

1. Air conditioning is required in many cases.
2. Highly sophisticated technology required for manufacturing of IC chips.

Question 14:
What is the main disadvantage of using fourth generation computers ?
Answer:
The main disadvantage of using fourth generation
computers is that the highly sophisticated technology required for manufacturing of VLSIC (Very Large Scale Integration Chip).

Short Answer Type Questions – II [3 mark each]

Question 1:
Explain the evolution of computing device.
Answer:
The computing devices have evolved from simple mechanical machines like ABACUS, Napier's Bones, Slide Rule, Pascal's Adding and Subtraction Machine, Leibniz's Multiplication and Dividing Machine, Jacquard Punched Card System, Babbage's Analytical Engine and Hallerith's Tabulating Machine, to the first electronic computer.

Question 2:
Explain first generation computers.
Answer:
First generation computers were vacuum tubes based machines. These were large in size, difficult to operate and instructions were to be written in machine language. Their computation time was in milliseconds.

Question 3:
Explain second generation computers.
Answer:
Second generation computers were transistor based machines. They used the stored program concept. Programs were written in assembly language. They were smaller in size, less expensive and required less maintenance than the first j generation computers. The computation time was j in microseconds.

Question 4:
Explain third generation computers.
Answer:
Third generation computers were characterized by the use of IC. They consume less power and required low maintenance compared to their predecessors. High-level languages were used for programming. The computation time was in nanoseconds. These computers were produced commercially.

Question 5:
What do you mean by fourth generation computers ?
Answer:
Fourth generation computers used micro-processors which were designed using the LSI and VLSI technology. The computers became small,
portable, reliable and cheap. The computation time is in Pico-seconds. They became available both to the home user and for commercial use.

Question 6:
Explain fifth generation computers.
Answer:
Fifth generation computers are capable of learning and self-organization. These computers use SLSI chips and have large memory requirements. They use parallel processing and are based on Artificial intelligence. The fifth generation computers are still being developing.

Question 7:
Write the classification of computer based on their sizes and types.
Answer:
Computers are broadly classified as micro-computers, mini computers, mainframe computers, and supercomputers based on their sizes and types.

Question 8:
Explain microcomputers.
Answer:
Microcomputers are small, low-cost and standalone machines. Microcomputers include desktop computers, notebook computers or laptops, netbooks, tablet computer, handheld computer and smart phones.

Question 9:
Explain mainframe computers.
Answer:
Mainframe computers are multi-user, multi-programming and high performance computers. They have very high speed, very large storage capacity and can handle large workloads. Mainframe computers are generally used in centralized databases.

Question 10:
What do you mean by supercomputers ?
Answer:
Supercomputers are the – most expensive machines, having high processing speed capable of performing trillions of calculations per second. The speed of a supercomputer is measured in FLOPS. Super-computers find applications in computing intensive tasks.

Long Answer Type Questions (4-5 marks each)

Question 1:
Write features of first generation of computers.
Answer:
First generation of computers :

- The main component of first generation of computers were vacuum tube.
- The size of computers were very big.
- Huge consumption of electricity (approx. 60 KW).
- It was a giant machine 30 x 50 feet long, weighed 30 tons, containing 20,000 values & 70,000 resistors.
- Programming language was machine level. Example : ENIAC, UNIVAC-I, EDSAC etc.

Question 2:
Write features of second generation of computers and give example.
Answer:
Second generation of computers :

- The main component of second generation of computers was transistor instead of vacuum tube.
- The size was still big but small in comparison to 1st generation.
- Electricity consumption was lower.
- They were faster and more reliable in comparison to the computers of 1st generation.
- Core memory was developed.
- Programming languages used were FORTRAN, COBOL, ALGOL, SNOBOL etc.
  Examples : IBM 1401, IBM 1620, IBM 7094, UNIVAC 1108, CDC 1604, CDC 3600.

Question 3:
Write the features of third generation of computers.
Answer:
Third generation of computers :

- The main component of third generation computers were integrated circuits(IC's) known as chips.

- More reliable computers, less expensive and faster in comparison to previous generations.
  Examples : IBM-360 Series, ICL1900 Series, Honey well Model 316.

Question 4:
Write features of fourth generation of computers.
Answer:
Fourth generation of computers :

- Main component for this generation computers are VLSIC (Very Large Scale Integrated Circuits), known as microchips consisting of a packing of about 50000 transistors.
- Computer cost reduced up to a great extent.
- Faster access facility and processing speed.
- Many powerful operating systems were developed.
- Multimedia computers are in existence.

Question 5:
What do you mean by super computers ? What was the purpose to develop super computers ?
Answer:
Super Computers : Super computers are the most powerful computers among digital computers. A super computer consists of several processors running together making them immensely faster and powerful. These computers are capable of handling ’v 2 amounts of data for calculation and storage A supercomputer has the capability equal to that of 40,000 microcomputers.
These computers are mainly used in areas like weather forecasting, nuclear science research, aerodynamic modeling, meteorology etc.
Examples : CRAY X-MP/14, CDC – 205, ETA GF – 10, NEC SX – 2, PARAM, ANURAG.
PARAM and ANURAG are super computers produced by India and exported to many European countries.

Question 6:
How can we define computers according to technology ? What are the difference between them ?
Or
What are the types of computers ? Define them.
Answer:
There are three types of computers according to the technology. These are :
(i) Digital Computers
(ii) Analog Computers
(iii) Hybrid Computers

1. Digital Computers : The computer which works on the digital signals or deals with discrete digital signals is called digital computer.

2. Analog Computers : The computer which works on physical analogies or physical quantities is called analog computer. It is a special purpose computer used to design specific problems.
3. Hybrid Computers : A computer which has the features of both analog and digital computers is called hybrid computer.

Question 7:
Write a short note on Herman Hollerith.
Answer:
In 1889, Herman Hollerith invented a machine which worked on electricity for the first time. One machine was used for recording data and the other one was used for doing calculations on that recorded data. His machine was capable of reading both numbers and letters. Herman Hollerith introduced the concept of punched cards. Hollerith invented the tabulating machine that could read Information from punched cards.

Question 8:
What are mainframe computers ? Mention the main characteristics of mainframe computers ?
Answer:
Mainframe computers are very large computers available in different models, capacities and prices. The main characteristics of mainframe computers are as follows :

1. Qualified operators and programmers are required for their operation.
2. They support a wide range of peripherals.
3. They have large storage capacities.
4. They can make the use of a wide variety of software.
5. These computers are mainly used in large commercial and government organizations.

Question 9:
Discuss the mini computers with their main characteristics.
Answer:
Mini computers were introduced in the 1960's. They have less capacity to manipulate and store data than mainframe computers.
Some of the main characteristics of mini computers are as follows :

1. They offer a limited range of peripherals.
2. Limited software can be used.
3. There is a facility for direct of ration of the machine by the end user.
4. Air conditioning is not necessary and is provided in many cases for dust control.
5. They are widely used for data processing.

Question 10:
What are microcomj uters ? Mention the characteristics of n crocomputers/personal computers.

Answer:
Micro computers/Personal computers are computers that use one or more microprocessors, and contain storage and input/output facilities, usually housed within a single enclosure. These have revolutionized the computer industry because of their size and cost.
Some of the characteristics of micro-Computers/ Personal computers are as follows :

1. They are cheap and easy to use.
2. They have limited input and output capacities.
3. They have low storage capacity.
4. Visual Display Unit (VDU) or printer is used to get the output.

TOPIC -3
Booting

Short Answer Type Questions – I [2 mark each]

Question 1:
What is booting ? What are the types of booting ?
Answer:
Booting is the process of restarting a computer or its operating system software. It starts with switching on the computer and ends when the operating System is loaded in main memory and the computer is ready to take commands from the user.
Booting is of two types :

1. **Cold booting :** When the computer is started after having been switched off.
2. **Warm booting :** When the operating system alone is restarted after a system crash or freeze.