Chapter 1: Introduction to Computer

1. **From which word is computer derived from?**
   The word computer is derived from Latin word '**computare**' which means to '**calculate**'.
2. **What is computer?**
   Computer is an electronic device which accepts raw facts and figure as input through input device, process it according to the instruction supplied by the user, stores it and produce a meaningful information as output through output device.
3. **Explain the working principle of computer.**
   The working mechanism of computer is based on the principle of IPO(Input, Process and Output) and Memory.
   i. **Input**: The process of providing data and instructions to the computer is called input. Input devices are used to enter data and instructions to the computer. Some of the examples of input devices are keyboard, mouse, scanner, microphone, etc.
   ii. **Process**: The process of executing or calculating the data as per the instructions is called process. It is performed by the CPU (Central Processing Unit).
   iii. **Output**: The meaningful information obtained after processing is called output. The output is provided to the user through output devices. Some of the output devices are monitor, speaker, plotter, printer, etc.
   iv. **Memory/Storage**: A physical device that stores data or instructions temporarily or permanently in it is called memory device. Computer can store data either temporarily in RAM or permanently in devices like Hard disk, pen drive, optical disk, etc. Some examples of memory devices are RAM, ROM, Hard disk, CD, DVD, etc.
4. **What are input devices? Write its examples.**
   The devices which are used to provide data and instructions to the computer for processing are called input devices. For example: keyboard, mouse, scanner, microphone, etc.
5. **What are output devices? Write its examples.**
   The devices which are used to provide the result obtained after processing to the user are called output devices. For example: monitor, speaker, plotter, printer, etc.

6. **What is data and information?**
   Data is the raw facts and figure which does not have any meaning. Information is the processed data that has some meaning.
7. **What is instruction and program?**
   Instruction is the command given to the computer. Program is the set instructions given to the computers to perform specific task.
8. **What is computer hardware and software?**
   Computer hardware is the physical part of the computer that can be touched and felt. For example: keyboard, mouse, printer, speaker, etc. Software is the logical part of the computer and collection of program that cannot be touched or felt. For example: MS-PowerPoint, MS-Word, MS-Excel, Google Chrome, etc.
9. **Explain the types of output.**
   The types of output are:

i. **Soft-copy output**: Output that cannot be physically touched and resides in the form of electronic media is called soft-copy output. The device that shows output on a screen or plays sound is called soft copy output device. Some of the examples of soft-copy output devices are monitor, speaker, etc.

ii. **Hard-copy output**: Output that can be physically touched is called hardcopy output. The device that provides output in the form of paper is called hardcopy output device. Some of the example of hardcopy output devices are printer, plotter, etc.

10. **What is processing?**
    The process of converting raw facts and figure into meaningful information.
11. **How is the speed of a computer measured?**
    The speed of a computer is measured in Hertz (Hz), commonly in Gigahertz (GHz).
12. **What is storage or memory device? List its types.**
    A physical device that stores data or instructions temporarily or permanently in it is called memory device. Its types are:
    i. Primary memory/Main memory
    ii. Secondary memory/Auxiliary Memory
13. **What is primary memory/main memory?**
    A physical device that stores data or instructions temporarily or permanently in it is called primary memory. For example: RAM and ROM.

14. **What is primary memory/main memory?**

    A physical device that stores data and information permanently in it is called secondary/auxiliary memory. For example: Hard disk, CD, DVD, pendrive, etc.

15. **Explain the characteristics/features of computer.**

    The characteristics/features of computer are explained below:

    i. **Accuracy**: Computer are the accurate machine that means result produced by computer are 100% accurate. Since, it follows GIGO. The error that may arise in output is due to human not by a computer.
    ii. **Speed**: Computer works on tremendously high speed. The operating speed of computer are measured in millisecond, microsecond, picosecond and nanosecond.
    iii. **Storage**: It is the area or unit which is capable of storing data and information for present and future use. These days computer comes with high volume of memory which are measured in Megabyte (1024 KB), Gigabyte (1024 MB), Terabyte (1024 GB) and Petabyte (1024 TB).
    iv. **Versatility**: The implementation of computer are not only limited to specific purpose, they solve general requirement of the user and can be used in more than one type of job.
    v. **Diligence**: Computer can perform any number of task continuously until it is accomplished. It never get tired like humans
    vi. **Automatic**: Once the instruction is generated it perform accordingly until command is terminated. This is called automatic.

16. **Explain the applications/implementation/uses of computer.**

    The applications of computer are listed and four of them are explained are described below.

    i. Education:
    ii. Communication:
    iii. Business:
    iv. Engineering and designing:
    v. Science and research
    vi. Military
    vii. Industry
    viii. Medicine
    ix. Robotics

x. Transportation

Education: Computers help students learn with videos, quizzes, and online classes. Teachers use computers to show presentations and store student records.

Medicine: Computers are used in hospitals for keeping patient records, diagnosing diseases, and controlling advanced machines like X-rays and MRI scanners.

Robotics: Robots controlled by computers can do tasks like cleaning, building cars, or even exploring other planets. They make work easier and safer for humans.

Business: Computers are used in businesses to manage accounts, store customer information, and create advertisements. They also help in online shopping and tracking sales

17. Write the capabilities and limitations of computers.

Capabilities/Advantages/Merits/Pros of computer:

i. It can store huge amount of data.
ii. It has higher speed and accuracy.
iii. It can be used to perform several jobs
iv. It provides faster and cheaper way for communication.
v. Computer are used to solve complex and critical situation.

Limitations/Disadvantages/De-merits/Drawback/Cons of computer:

i. It cannot make their decision on their own.
ii. It operates on electricity or battery.
iii. It can affect human eye, when used for long period of time.
iv. It may be not affordable for everyone.
v. It cannot think, learn or react as human.
vi. It cannot draw conclusion and provide feedback.

Chapter 3: Generation of Computer

18. Define generation of computer. List the different generations of computer.

Generation of computer is the division of electronic computers on the basis of technology used by the computer. The different generations of computer are:

i. First generation of computer
ii. Second generation of computer
iii. Third generation of computer
iv. Fourth generation of computer
v. Fifth generation of computer

19. Write the features of first generation of computers.

The features of first generation of computers are:

i. **Vacuum tube** was used as the main component.

ii. The operating speed of the computer was in terms of **millisecond**.

iii. **Machine language** was used to develop program.

iv. **Magnetic core memory** was used as the primary memory.

v. **Punched card, magnetic drum and magnetic tape** were used as secondary memory.

vi. **Punched card** as input and the **printed copy** as output were used.

vii. **Example:** ENIAC, EDVAC, EDSAC, UNIVAC etc.

20. Write the features of second generation of computers.

The features of first generation of computers are:

i. **Transistor** was used as the main component.

ii. The operating speed of the computer was in terms of **microsecond**.

iii. **Assembly language** was used to develop program.

iv. **Magnetic core memory** was used as the primary memory.

v. **Magnetic drum and magnetic tape** were used as secondary memory.

vi. **Punched card** as input and the **printed copy** as output were used.

vii. **Example:** Leo Mark III, IBM 1620, IBM 7094, etc.

21. Write the features of third generation of computers.

The features of first generation of computers are:

i. **Integrate Circuit (IC)** was used as the main component.

ii. The operating speed of the computer was in terms of **nanosecond**.

iii. **High Level Language (HLL)** was used to develop program.

iv. **RAM and ROM** were used as the primary memory.

v. **Magnetic tape and magnetic disk** were used as secondary memory.

vi. **Keyboard** as input and the **monitor** as output device were used.

vii. **Example:** IBM 360 series, ICL 900 series, Honeywell 200 series, etc.

22. Write the features of fourth generation of computers.

The features of first generation of computers are:

i. **Microprocessor or VLSI** is used as the main component.

ii. The operating speed of the computer is in terms of **picosecond**.

iii. **High Level Language (HLL) and Fourth generation language (4GL)** are used to develop program.

iv. **RAM, ROM and cache memory** are used as the primary memory.

v. **Magnetic disk, optical memory and flash memory** are used as secondary memory.

vi. Flexible input/output devices like mouse, touch screen, LCD, LED are

used.

vii. **Example:** IBM desktop PC, Dell notebook, iPad, HP laptop, etc.

23. Write the features of fifth generation of computers.

The features of first generation of computers are:

i. **Biochip** will be used as the main component.

ii. The operating speed of the computer will be in terms of **femtosecond**.

iii. **Natural language** will be used to develop program.

iv. **Superconductor memory** will be used.

v. The computer will have Artificial Intelligence (AI).

vi. **Example:** Param 1000, Pentium PCs, Intel P4, etc.

24. What is Artificial Intelligence (AI)?

Artificial Intelligence is the ability of artificial object to learn, think and make decisions as humans.

25. What is vacuum tube?

A vacuum tube is an electrical device that controls movement of electric current between electrodes in a vacuum.

26. What is transistor?

A transistor is a semiconductor device used to amplify or switch electronic signals.

27. What is Integrate Circuit (IC)?

Integrate Circuit is a small silicon chip that contains large number of transistors within it.

28. **Write short notes on:**

a) Vacuum tube: A vacuum tube is an electrical device that controls movement of electric current between electrodes in a vacuum. It is also called electron tube or valve. It is the main technology used in first generation computer.

b) Transistor: A transistor is a semiconductor device used to amplify or switch electronic signals. It replaced the vacuum tube in second generation of computer because it is smaller, reliable, faster and has low power requirement than vacuum tube.

c) Integrated Circuit (IC):

Integrate Circuit is a small silicon chip that contains large number of transistors within it. It is major technology used in third generation computer. It is based on Large Scale Integration.

d) Artificial Intelligence (AI): Artificial Intelligence is the ability of artificial object to learn, think and make decisions as humans. It can be used in various areas like military, medical, education, business, research, molecular modeling, study of DNA structure, etc. It can perform the work faster than the human at high accuracy.

Chapter 4: Types of Computer

29. **What are the classification/different types of computers?**

Classification of computer: Depending upon the use and advancement of technology computer are categorized in 4 different types:

Classification of Computer				
Basis of Operation/ working principle	**Basis of Purpose or use**	**Basis of performance and size**	**Basis of brand**	**Basis of model**
i. Analog computers	i. General purpose computer	i. Super computer	i. IBM PC	i. XT

ii. Digital computers	ii. Special purpose computer	ii. Mainframe computer	ii. IBM compatible	ii. AT
iii. Hybrid computers		iii. Mini computer	iii. Apple machintosh	iii. PS/2
		iv. Micro computer		

30. **What is general purpose computer? Give some examples.**
    A computer which can be used for multiple or generalized task is called general purpose computer. For example: Desktop Pc, laptop, Notebook pc, etc.
31. **What is special purpose computer? Give some examples.**
    A computer which is used for particular work only is called special purpose computer. For example: thermometer,seismograph, speedometer, etc. Most of the analog and hybrid computers are special purpose computer.
32. **Explain the types of computer on the basis of purpose or use.**
    The types of computers on the basis of purpose or use are:
    i. General Purpose Computer:
    A computer which can be used for multiple or generalized task is called general purpose computer. For example: Desktop Pc, laptop, Notebook pc, etc. It is the ordinary computer computer which can store large amounts of data, programs and used for preparing documents, playing games, watching movies, surfing internet, etc.
    ii. Special Purpose Computer:
    A computer which is used for particular work only is called special purpose computer. For example: thermometer,seismograph, speedometer, etc. Most of the analog and hybrid computers are special purpose computer. Such computers are used for weather forecasting, rocket launching, diagnosis in hospital, controlling industry, etc.
33. **What is analog computer? Give some examples.**
    Analog computer is a computer that operates on continuous data like temperature, speed, pressure, etc. by measuring and comparing. For example: Presley, speedometer, thermometer, voltmeter, etc.

34. **What is digital computer? Give some examples.**
    Digital computer is a computer that operates on discontinuous data like 0 and 1 by counting and calculation. For example: Desktop, laptop, digital watch, etc.
35. **What is hybrid computer? Give some examples.**
    Hybrid computer is a computer that operates on both continuous and discontinuous data. For example: ECG (Electrocardiogram) machine, CT scan machine, ultrasound machine, etc.
36. **Write the differences between analog computers and digital computers.**
    Differentiate between analog and digital computers with examples.

Analog computer	**Digital computer**
It operates on continuous data like temperature, speed, pressure, etc.	It operates on discontinuous data like 0 and 1.
It operates by comparing and measuring.	It operates by counting and calculation.
It is special purpose computer.	It is general purpose computer.
It is less accurate, cheaper and has low storage capacity.	It is more accurate, expensive and has high storage capacity.
Example: Presley, speedometer, thermometer, voltmeter, etc.	For example: Desktop, laptop, digital watch, etc.

37. **Explain the types of computers on the basis of working principle/operation.**
    The types of computers on the basis of working principles/operation are:
    i. Analog Computer
    Analog computer is a computer that operates on continuous data like temperature, speed, pressure, etc. by measuring and comparing. For example: Presley, speedometer, thermometer, voltmeter, etc. It is special purpose computer.

ii. Digital Computer

Digital computer is a computer that operates on discontinuous data like 0 and 1 by counting and calculation. For example: Desktop, laptop, digital watch, etc. It is general purpose computer.

iii. Hybrid Computer

Hybrid computer is a computer that operates on both continuous and discontinuous data. For example: ECG (Electrocardiogram) machine, CT scan machine, ultrasound machine, etc. It is special purpose computer.

38. Define supercomputer. Give some examples.

Supercomputer is the most expensive and fastest computer in terms of processing speed. For example: CRAY, ANURAG, PARAM, etc.

39. **Define mainframe computer. Give some examples.**

A mainframe computer is a large, powerful computer that can process billions of transactions and calculations in real time. For example: IBM 1401, ICL 39, CYBER 170, etc.

40. **Define minicomputer. Give some examples.**

A minicomputer is a small-scale computer that's more powerful than a personal computer but less powerful than a mainframe. For example: HCL, MAGNUM, PDP series, etc.

41. Define microcomputer. Give some examples.

Micro computers are the smallest and most portable computers which are based on microprocessor. For example: Desktop, Laptop, mobile phone, etc.

42. Explain the types of computer on the basis of size.

The types of computer on the basis of size are:

i. Super computer

Supercomputer is the most expensive and fastest computer in terms of processing speed. For example: CRAY, ANURAG, PARAM, etc. It is special purpose computer. It is used in the areas of defence and weaponry, weather forecasting, scientific research, satellite communication, molecular modelling, study of DNA structure, etc.

ii. Mainframe computer

A mainframe computer is a large, powerful computer that can process billions of transactions and calculations in real time. For example: IBM 1401, ICL 39, CYBER 170, etc. It is used for storing large amount of data, large volume processing and supporting large number of users at a same time. It is the largest computer on the basis of size. IBM 1401 was the first computer

brought in Nepal.

iii. Mini computer

A minicomputer is a small-scale computer that's more powerful than a personal computer but less powerful than a mainframe. For example: HCL, MAGNUM, PDP series, etc. It occupies around 100 sq. ft area and contains around 50 I/O terminals. It is used by medium sized organization such as medium sized banks, business organizations, colleges, insurance companies, etc. with limited amount of data to be stored and a smaller number of users to support.

iv. Micro computer

Micro computers are the smallest and most portable computers which are based on microprocessor. For example: Desktop, Laptop, mobile phone, etc. It has single I/O terminal, so it is developed for single user.IT is used for personal use such as creating documents, accessing internet, entertainment, communication, etc. It has least storage capacity, slowest processing speed and cheapest cost.

There are three types of microcomputers:

a. Desktop computers: These portable computers are also called personal computers (PC). They are so portable that fix in the desk of the user. They are general purpose computers which can be use to perform several varieties of work.

b. Laptop computers: They are the most portable micro computer that exist today. They can easily carried from one place to another place easily. Since, they can run on battery also they can be carried to any place of work.

c. Handheld/Palmtop: Handheld/Palmtop or Personal Digital Assistant (PDA) are the small battery powered device which can be used a computing device to store address, schedule appointment, take notes or even play games. The handheld devices this days has more functionality and use touch screen technology.

43. Define microcomputers. Explain its types in brief.

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c. Handheld/Palmtop: Handheld/Palmtop or Personal Digital Assistant (PDA) are the small battery powered device which can be used a computing device to store address, schedule appointment, take notes or even play games. The handheld devices this days has more functionality and use touch screen technology.

44. Write the differences between microcomputer and supercomputer.

Micro computer	**Super computer**
It is a less powerful and slower computer in terms of processing.	It is a more powerful and faster computer in terms of processing.
It is a general purpose computer.	It is a special purpose computer.
It can be portable as well as non-portable.	It is non-portable computer.
It can be handled by only one person.	It requires numbers of experts or users to handle.
It is smaller and cheaper than supercomputer.	It is expensive and larger than microcomputer.
For example: Desktop, Laptop, Tablet, etc.	For example: CRAY, ANURAG, PARAM, etc.

45. **Which was the first computer brought in Nepal, when and why?**

    The fiirst computer brought in Nepal was IBM 1401 in 2028 BS for population census which was a mainframe computer.

46. **Some key points to remember:**

    Key point:

    IBM company was originally a tabulating machine company established by Dr. Herman Hollerith.

    IBM PC are the branded computers manufactured by IBM company.

    IBM compatibles are duplicate of IBM often called assembled computers.

    Apple computer have their own hardware and software.