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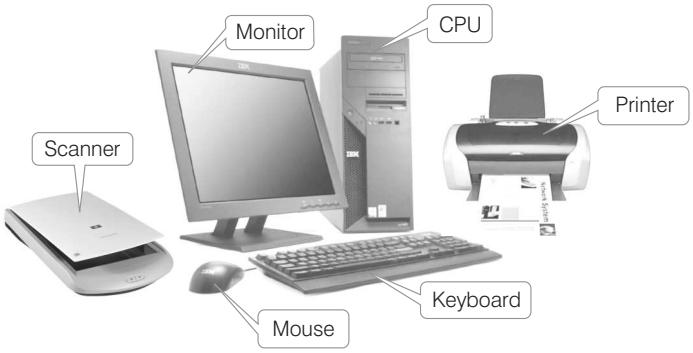
Introduction to **Computer**

A computer is an electronic machine that accepts data from the user, processes the data by performing calculations and operations on it and generates the desired output as a result. The term computer is derived from the Latin word 'computerae' which means 'to compute'.

Generally, computer is the combination of **Hardware** and **Software** which converts data into information. Computer operates on set of instructions only, they cannot think as human being.



A Computer System

Functioning of a Computer System

Computer is responsible for performing four basic functions

1. **Input** Information or data that is entered into a computer is called input. It sends data and instructions to the Central Processing Unit (CPU).
2. **Processing** It is the sequence of actions taken on data to convert it into information which is meaningful to the user. It can be calculations, comparisons or decisions taken by the computer.
3. **Output** It makes processed data available to the user.
4. **Storage** It stores data and programs permanently.

Terms Related to Computer

Hardware Hardware is the collection of physical elements that constitute a computer system. It is a comprehensive term for all the physical parts of a computer. *e.g.*, display screens, disks, keyboards, mouse, printers, scanner, chips, etc.

Software It is a set of programs and procedures. Software tells the hardware what to do and how to accomplish a task. *e.g.*, web browsers, word processors, etc.

Data Unprocessed raw facts and figures, like numbers, text on pieces of paper, are known as data.

Information When data is processed, organized, structured or presented in a given context so as to be useful, then it is called information.

Instruction It is a command given to a computer in the computer language by the user.

Program It is a set of instructions given to a computer in order to perform some task.

History of Computer Evolution

Computer is not the creation of one day, rather it took a long period for the development of modern computer.

Invention	Inventor	Time	Characteristics	Applications
Abacus	China	16th century	• First *mechanical calculating device*. • It used *set of beads* for representing unit. • A horizontal rod represent the *one*, *tens*, *hundred,* etc.	• Used for addition and subtraction operation. • Calculation of square roots can also be performed.
Napier's Bones	John Napier	1617	• Three dimensional structure. • Holding numbers 0 to 9 only. • Represent graphical structure of calculating result.	• Perform multiplication on numbers. • Technology used for calculation called **Rabdologia**. • Operation performed on the embedded rods.
Pascaline	Blaise Pascal	1642	• First mechanical **adding machine**. • It was structured like rectangular box, with eight disc (represent number of units). • The term **carry** was introduced in this period.	• Perform addition and subtraction of two numbers. • Mainly designed with regard to the *pressure of liquid.*
Card of Holes for Weaving Pattern	Joseph Jacquard	1801	• First **mechanical loom.** • Mainly weaved a silk based pattern. • Used **punched card** for the sequence of operation.	• Simplified the process of **Textiles.**
Analytical Engine	Charles Babbage	1834-71	• To program the machine, it used two-punchcard. • First *general-purpose* computer. • Stored program in the form of 'pegs' also called **barrels**.	• Generally used for basic *arithmetic operations*. • It was a decimal machine used sign and magnitude for representation of a number.
Tabulating Machine	Herman Hollerith	1880	• It used punched cards with round holes. • Read one card at a time.	• It was the first **electromechanical machine,** which was designed to process the data for **census in 1890.**
MARK-I	Howard Aiken	1944	• Consists of *interlocking panels* of small glass , counters, switches and control circuits. • Data can be entered manually.	• Mainly used in the war effort during World War-II. • Magnetic drums are used for storage.
ENIAC	JP Eckert and JW Mauchly	1950	• It is a combination of *twenty accumulators*. • It can also tiggered different operations.	• *First electronic digital computer.* • Used for weather prediction, atomic energy calculation and other scientific uses.
EDSAC	John Von Neumann	1946-52	• It was *first computer* which provided **storage** capacity. • Capable of storing instructions and data in memory. • Also calculate table of squares and a list of prime numbers.	• First computer program was run on machine. • Used mercury delay lines for memory and vacuum tubes for logic.
UNIVAC	Eckert and JW Mauchly	1951	• First *general-purpose electronic computer* with large amount of input and output. • Performed both numeric and textual information.	• Used **magnetic tapes** as input and output.
IBM-650 Computer	IBM Company	1954	• Provided input/output units converting alphabetical and special characters to two-digit decimal code.	• Payroll processing • Oil refinery design • Market research analysis

Generations of Computer

A generation refers to the state of improvement in the development of system. Computers are built of Electromechanical, before generation. Each generation of computer is characterized by a major technological development that fundamentally changed the way, computers operate.

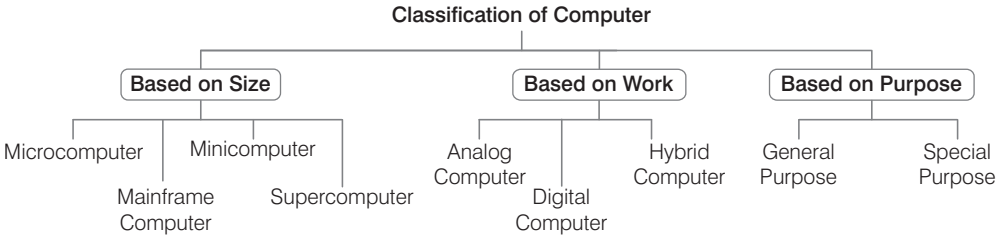
Generation	Year	Switching Device	Storage Device	Speed	Operating System	Language	Characteristic	Application
First	1940-56	Vacuum tubes	Magnetic drums	333 micro second	Batch operating system	Machine language (Binary number 0s and 1s)	• Fastest computing device. • Generate large amount of heat. • Non-portable.	Used for scientific purpose *e.g.,* ENIAC, UNIVAC
Second	1956-63	Transistors	Magnetic core technology	10 micro second	Time-sharing system, Multitasking OS	Assembly language, high level language	• More reliable and less prone to hardware failure. • Portable and generate less amount of heat.	Used for commercial production *e.g.,* PDP-8, IBM-1401
Third	1964-71	Integrated Circuits (ICs)	Magnetic core as primary storage medium	100 nano seconds	Real-time system	High level language (FORTRAN, COBOL) ALGOL	• Consumed less power. • Highly sophisticated technology required.	Database management system *e.g.,* NCR-395, B6500
Fourth	1971-Present	Large Scale Integrated (LSI) circuit microprocessor	Semi conductor memory, Winchester disk	10 pico second	Time sharing network, GUI interface.	PASCAL, ADA, COBOL-74 FORTRAN IV	• More reliable and portable. • This generation leads to better communication and resource sharing.	Distributed system, *e.g.,* Intel 4004 chip, Macintosh.
Fifth	Present and Beyond	Super Large Scale Integrated (SLSI) chips	—	—	—	—	• Parallel processing • Intel core microprocessor is implemented. • Enables mega chips	Artificial intelligence *e.g.,* Robotics

Tit-Bits

- **Charles Babbage** is called the father of computer.
- **Alan Turing** is known as the father of modern computer.
- The **First Computer** architecture was introduced by John Von Neumann in 1948.
- **EDVAC** was the first electronic computer constructed at the Moore School of Engineering (USA).
- **ENIAC** was the world's first successful electronic computer which was developed by the two scientists namely J P Eckert and J W Mauchy. It was the beginning of first generation computer.
- Binary number system was suggested by *John von Neumann*
- **Microprocessor** is the main concept behind fourth generation of computer.
- In 1971, Ted Hoff invented Intel 4004 chip which was the world's first single chip microprocessor.
- Transistors were invented by Bell laboratory of America in 1953 and were made up of semiconductors like germanium and silicon.
- In 1958, Jack St. Clair Kilby and Robert Noyce invented the first IC. IC was made up of silicon material and consists of thousands of transistors on a single chip.

Classification of Computer

Computers are mainly classified as two types



Based on Size

On the basis of size, computer are categorise as follows

1. Microcomputer

Microcomputers are the least powerful, yet the most widely used and fastest growing type of computers and are also called **portable computers.** Microcomputer consists of three basic categories of physical equipment *i.e* system unit, input/output and memory.

Some types of microcomputer are

Desktop Computer or Personal Computer (PC) These are small, relatively inexpensive computers. These are based on the micro-processor technology (Integrated Circuit).

Notebook Notebook computers, also known as *ultra book* or laptop, are portable lightweight and fit into most briefcases. They include rechargeable battery, so these can work anywhere. Laptops were developed by *Alan Kay.*

Handheld Computers or Palmtops These are the smallest and are designed to fit into the palm. So, these are also known as Palmtop/PDA. They are practical for certain functions such as phone books and calendars. They use the pen for input instead of keyboard.

Tablet Computer They have key features of the notebook computer, but it can accept input from a pen instead of the keyboard or mouse.

Smart Phones Smart phones are cellular phones that function both as a phone and as a small PC. They may use a pen or may have a small keyboard. They can be connected to the internet wirelessly. Apple, Blackberry, Nokia are some manufacturers of smart phones.

2. Mainframe Computer

Mainframe computers are those having large internal memory storage and comprehensive range of software. Mainframe computer serves as a backbone for the entire business world. It is considered as the heart of a network of computers or terminals that allows a large number of people to work at the same time. Mainframe computers are IBM-370, IBM-S/390, UNIVAC-1110.

3. Minicomputer

Minicomputers are smaller in size, faster, cost lower than mainframe computers. Initially, the minicomputer was designed to carry out some specific tasks, like engineering and Computer Aided Design (CAD) calculations. But now, they are being used as central computer which is called as *Server*. Mini computers are IBM-17, DEC PDP-11, HP-9000, etc.

4. Supercomputer

Supercomputers are the fastest and the most expensive machines. They have high processing speed compared to other computers. The speed of supercomputers are measured in FLOPS (Floating Point Operations Per Second).

Supercomputers are used for highly calculationintensive tasks, such as weather foresting, nuclear research, military agencies and scientific research laboratories.

Supercomputers are most powerful, large in size and memory, compared to all other computers.

Tit-Bits

- **Siddhartha** was the first computer developed in India.
- The world's first computer called the **Z1,** was invented by Konrad Zuse.
- **CRAY-1** was the world's first supercomputer introduced by Seymour R CRAY in 1976.
- **PARAM** was the first supercomputer developed in India in 1990. It is a series of gigaflops, assembled by C-DAC in Pune.
- **PARAM YUVA II** is the latest machine in the series of PARAM made by C-DAC (Pune) in India. It performs at a peak of 524 teraflops. It has been ranked 33rd in the list of Top 500 supercomputers in world.
- **Tianhe-2** is the world's fastest supercomputer launched by China at NUDT university in 2013. It is based on Rylin Linux operating system with 33.86 petaflops.

Based on Working of System

On the basis of work, computers are categorised as follows

1. Analog Computer

Analog computers are the job-oriented computers. They carry out arithmetic and logical operations by manipulating and processing of data. *e.g.,* speedometers, seismograph, etc.

> Analog computer can perform several mathematical operations simultaneously. It uses continuous variables for mathematical operations and utilises mechanical or electrical energy.

2. Digital Computer

Digital computers work by calculating the binary digits. A digital computer, not only performs mathematical problems, but also combines the bytes to produce desired graphics, sounds. *e.g.,* desktop (PC).

3. Hybrid Computer

Hybrid computers are the combination of analog and digital computers. Machines used in hospitals like ECG and DIALYSIS are the commonly used hybrid computers.

> Quantum computers was first introduced by Richard Feynman. It uses quantum mechanical phenomena. It is the fastest computer imitating Brain working.

Based on Purpose

On the basis of purpose, computers are categorised as follows

1. General Purpose Computer

General purpose computers are those computers, which are used to solve variety of problems by changing the program or instructions. *e.g.,* to make small database calculations, accounting, etc.

2. Special Purpose Computer

Special purpose computers are those computers which are used to solve a single and dedicated type of problem. *e.g.,* automatic aircraft landing, multimedia computer, etc.

Features of Computer

The key features of computer are

1. **Speed** The computer can process data very fast at the rate of millions of instructions per second.
2. **Accuracy** Computers provide a high degree of accuracy. They respond to the user as per the input instructions.
3. **Storage Capacity** Computers are capable to store huge amount of data which depends on the capacity of hard disk.
4. **Versatility** Computers can do different types of work simultaneously. They can perform multiple tasks at a same time.
5. **Plug and Play** Computers has the ability to automatically configure a new hardware and software component.
6. **Diligency** Unlike human beings, a computer is free from monotony, tiredness, lack of concentration etc and can work for hours without creating any errors.
7. **Secrecy** Leakage of information is reduced by creating login system with password protection *e.g.,* ATM counter, E-mail etc.

Applications of Computer

Now-a-days computers have been employed in almost all the aspects of professional and personal life.

Some of the areas where computers are being used are

Education Computers have proved to be excellent teachers. Educational institutes are using computers in many ways like tele-education, virtual classroom, online classes, etc.

Science Scientists have long been users of it. A new adventure among scientists is the idea of a collaboratory, an internet based collaborative laboratory, in which researchers all over the world can work easily together even at a distance.

Industry Computers are used here to control manufacturing system and continuous running of the machinery.

Parameters like temperature, pressure, volume are monitored and controlled by computers. Robotics, developed with the help of computers plays a very crucial role here.

Recreation and Entertainment Our entertainment and pleasure-time have also been affected by computerisation.

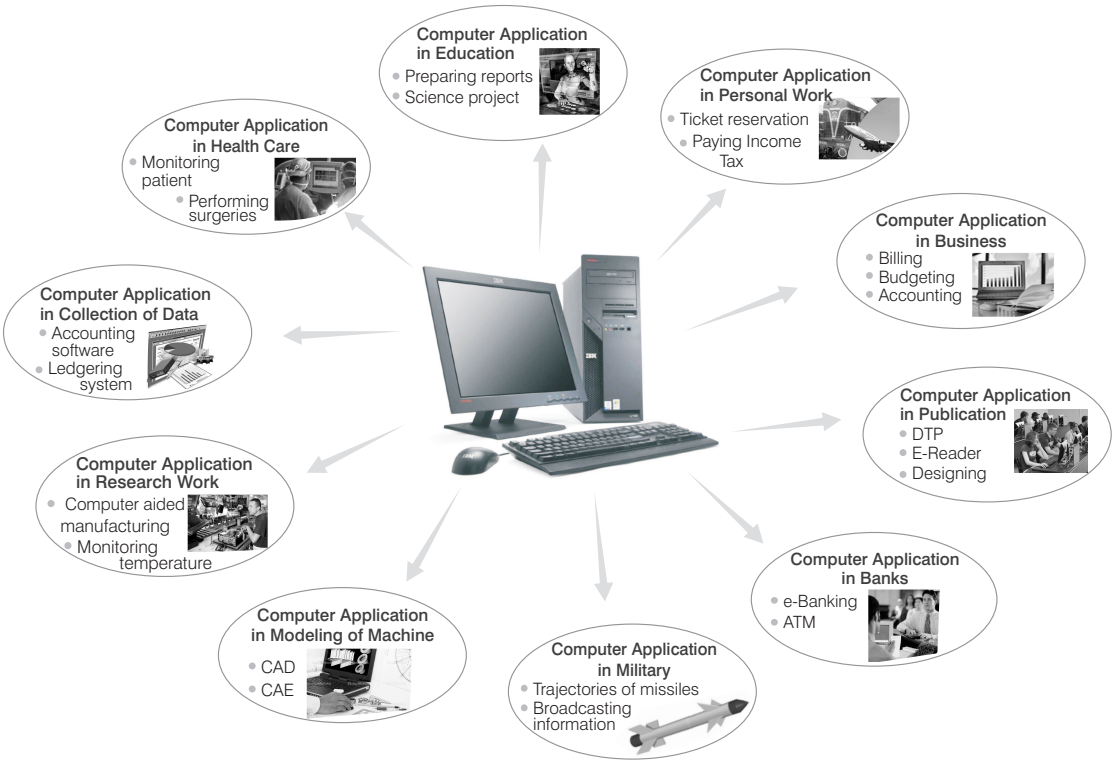
Government Various departments of the Government use computer for their planning, control and law enforcement activities.

Health Computer plays a very crucial role in this area. Activities like scanning, X-ray, tele-medicine, patient monitoring, patient records, diagnosis, etc are performed with the help of computers.

Multimedia Multimedia is the field concerned with the computer controlled integration of text, graphics, drawings, animation, audio and any other media where each type of information can be represented, stored, transmitted and processed digitally.

Banks Computers can be used in the **banks** to keep the records of customer's accounts.

Military Personnel They also make use of computers for their crucial tasks like determining the weather, computing the trajectories of missiles, etc.



Different Areas of Computer Applications

Business Using a wide range of **business** software a company's marketing division can produce sales forecasts and devise new strategies.

E-Commerce Traditionally, commerce is seen as the exchange or buying and selling of goods and services, which involves exchange of money and sometimes transportation of goods. Electronic commerce that takes place between businesses is referred to as business-to-business or B2B.

Publication Computers have made publication process an easy one. Without computers, the different parts of a publication-text, illustrations and graphics-must be created individually, then cut out and pasted down to form a page layout.

Check Your Skills

1. Computer is a/an
(1) battery *(2)* electronic machine
(3) All of these *(4)* None of these

2. The word computer has been derived from which of the following language?
(1) Greek *(2)* English
(3) Hindi *(4)* Latin
(5) Spanish

3. IC is made up of **[SBI Clerk 2011]**
(1) transistors *(2)* microprocessors
(3) vacuum tubes *(4)* Both '1' and '2'
(5) None of these

4. Speed of first generation computer was in **[IBPS Clerk 2012]**
(1) nano seconds *(2)* milliseconds
(3) nano-milli seconds *(4)* micro seconds
(5) None of these

5. Time sharing became possible in ..... generation of computers. **[SBI PO 2011]**
(1) first *(2)* second
(3) third *(4)* fourth
(5) None of these

6. Computer cannot perform
(1) input *(2)* output
(3) thinking *(4)* processing
(5) storage

7. Computer system consists
(1) internal device *(2)* peripheral device
(3) software *(4)* All of these
(5) None of these

8. Which of the following is known as father of computer?
(1) Dennis Ritchie *(2)* Napier
(3) Charles Babbage *(4)* Alan Turing
(5) Grace Hoppers

9. Which of the following is known as father of modern computer?
(1) Dennis Ritchie
(2) Napier
(3) Charles Babbage
(4) Alan Turing
(5) Grace Hoppers

10. First generation computers used ..... languages. **[SBI Clerk 2012]**
(1) machine *(2)* assembly
(3) Both '1' and '2' *(4)* high level
(5) None of these

11. Which of the following refers to the fastest, biggest and most expensive computer? **[IBPS Clerk 2011]**
(1) Note books *(2)* Personal computer
(3) Laptops *(4)* Super computer
(5) PDA'S

12. Computer size was very large in
(1) first generation *(2)* second generation
(3) third generation *(4)* fourth generation
(5) fifth generation

13. First generation computers were based on
(1) transistors *(2)* conductors
(3) ICs *(4)* vacuum tubes
(5) None of these

14. The earliest calculating device is
(1) calculator *(2)* abacus
(3) difference engine *(4)* analytical engine
(5) None of these

15. Which language is directly understood by the computer without translation program? **[IBPS Clerk 2011]**
(1) BASIC language *(2)* Assembly language
(3) High level language *(4)* C language
(5) Machine language

16. Computer built before the first generation computer was
(1) mechanical *(2)* electro-mechanical
(3) electrical *(4)* electronics
(5) All of the above

17. Abacus can perform
(1) addition *(2)* subtraction
(3) multiplication *(4)* Both '1' and '2'
(5) All of these

18. Pascaline is also known by
(1) abacus
(2) adding machine
(3) division machine
(4) difference machine
(5) None of the above

19. Who developed integrated chip?
(1) Robert Nayak *(2)* C Babbage
(3) JS Kilby *(4)* CV Raman
(5) None of these

20. Speed of third generation computer is
(1) milli sec (10^{-3}) *(2)* micro sec (10^{-6})
(3) nano sec (10^{-9}) *(4)* pico sec (10^{-12})
(5) None of these

21. Artificial intelligence is an example of
(1) first generation computer
(2) second generation computer
(3) third generation computer
(4) fourth generation computer
(5) fifth generation computer

22. First super computer of the world is
(1) CRAY-1 *(2)* PARAM
(3) Tianhe-2 *(4)* IBM-370
(5) HP-9000

23. A ..... is a microprocessor-based computing device.
(1) mainframe
(2) personal computer
(3) supercomputer
(4) analog computer
(5) None of the above

24. First computer of India is
(1) PARAM *(2)* Siddharth
(3) IBM-370 *(4)* CRAY-1
(5) None of these

25. Choose the odd one out. **[IBPS Clerk 2011]**
(1) Microcomputer *(2)* Minicomputer
(3) Supercomputer *(4)* Digital computer
(5) Notebook computer

26. Which of the following options correctly expresses the meaning of the term 'PCs'? **[IBPS PO 2012]**
(1) Independent computers for all working staff
(2) Personal computers widely available to individual workers with which they can access information from layer systems and increase their personal productivity
(3) Packed computers system formed by joining together of various computer terminals
(4) Computer manufactured by the Pentium Company
(5) None of the above

27. Which of the following is the smallest and fastest computer imitating brain working? **[IBPS PO 2012]**
(1) Super computer
(2) Quantum computer
(3) Param-10000
(4) IBM chips
(5) None of the above

28. Benefits of computers are
(1) very fast and can store huge amount of data
(2) provide accurate output either input is correct or not
(3) think about the processing
(4) All of the above
(5) None of the above

29. Name the first general purpose electronic computer. **[IBPS PO 2012]**
(1) ADVAC *(2)* ADSAC
(3) UNIVAC *(4)* EDVAC
(5) None of these

30. The chip, used in computers, is made of **[IBPS PO 2012]**
(1) chromium *(2)* iron oxide
(3) silica *(4)* silicon
(5) None of these

31. A desktop computer is also known as a **[Union Bank of India Clerk 2010]**
(1) palm pilot *(2)* PC
(3) laptop *(4)* mainframe
(5) None of these

32. A personal computer is designed to meet the computing needs of an
(1) individual *(2)* department
(3) company *(4)* city
(5) world

33. A ..... is a large and expensive computer capable of performing scientific and business applications.
(1) supercomputer
(2) mainframe computer
(3) minicomputer
(4) handheld computer
(5) desktop computer

34. The first computer language developed was **[SSC Section Officer 2010]**
(1) COBOL *(2)* BASIC
(3) PASCAL *(4)* FORTRAN

35. A hybrid computer is the one having the combined properties of **[SSC CGL 2013]**
(1) super and micro computers
(2) mini and micro computers
(3) analog and digital computers
(4) super and mini computers

36. Which of the following uses a handheld operating system? **[SBI PO 2013]**
(1) A supercomputer
(2) A personal computer
(3) A laptop
(4) A mainframe
(5) A PDA

37. Analytical engine developed by
(1) Blaise Pascal *(2)* Charles Babbage
(3) Dennis Ritchie *(4)* Alan Turing
(5) None of these

38. A computer also known as server computer, is
(1) supercomputer *(2)* mainframe computer
(3) minicomputer *(4)* microcomputer
(5) None of the above

39. The user generally applies ..... to access mainframe or super computer. **[Allahabad Bank Clerk 2010]**
(1) terminal *(2)* node
(3) desktop *(4)* hand held
(5) None of these

40. Microcomputer hardware consists of three basic categories of physical equipment **[Syndicate Bank Clerk 2010]**
(1) keyboard, monitor, hard drive
(2) system unit, input/output, memory
(3) system unit, input/output, secondary storage
(4) system unit, primary storage, secondary storage
(5) None of the above

41. Tablet PC is a type of
(1) microcomputer *(2)* supercomputer
(3) minicomputer *(4)* mainframe computer
(5) None of the above

42. Which of the following is the fastest type of computer? **[IBPS Clerk 2011]**
(1) Laptop *(2)* Notebook
(3) Personal computer *(4)* Work station
(5) Super computer

43. Analog computer works on the supply of
(1) continuous electrical pulses
(2) electrical pulses but not continuous
(3) magnetic strength
(4) physical strength
(5) natural strength

44. Laptops are
(1) computers used in clinical laboratories
(2) portable, light weight and fit into briefcases
(3) hearing voice recognition system
(4) desktop
(5) All of the above

45. The first computer which provides storage is **[SSC CPO 2012]**
(1) EDSAC *(2)* EDBAC
(3) MARK-I *(4)* ACE

46. A typical modern computer uses
(1) LSI chips *(2)* vacuum tubes
(3) valves *(4)* Both '1' and '2'
(5) None of these

47. The period of the second generation computers was **[SSC CGL 2008]**
(1) 1946-1958 *(2)* 1940-1960
(3) 1956-63 *(4)* 1957-1964

48. ENIAC was **[SSC CGL 2010]**
(1) an electronic calculator
(2) an memory device
(3) an electronic digital computer
(4) an engine

49. Palmtop computer is also known as
(1) personal computer
(2) notebook computer
(3) tablet PC
(4) handheld computer
(5) None of the above

50. ..... is not a microcomputer.
(1) Desktop computer
(2) Laptop
(3) Tablet PC
(4) Handheld computer
(5) Mainframe computer

51. General purpose computers are used for
(1) creating a small database
(2) performs calculation
(3) accounting
(4) All of the above
(5) None of the above

52. Which is not the example of special purpose computer?
(1) Automatic aircraft landing
(2) Word processor
(3) Multimedia computer
(4) All of the above
(5) None of the above

53. ..... is not an E-commerce application.
(1) House banking
(2) Buying stocks
(3) Conducting an auction
(4) Evaluating an employee
(5) None of the above

54. Computer's basic architecture was developed by
(1) John Von Neumann
(2) Charles Babbage
(3) Blaise Pascal
(4) Jordan Murn
(5) None of the above

55. In production of IC chip of computer, what is needed in the following?
(1) Chromium *(2)* Silicon
(3) Platinum *(4)* Gold
(5) None of the these

56. First supercomputer developed in India is
(1) PARAM *(2)* Aryabhatt
(3) Buddha *(4)* Ram
(5) None of the these

57. Computers that are portable and convenient to use for users who travel, are known as
(1) supercomputers
(2) minicomputers
(3) mainframe computers
(4) laptops
(5) file servers

58. Which was the first electronic computer constructed at the Moore School of Engineering? **[SSC CGL 2013]**
(1) EDVAC
(2) ONIVAC
(3) ENIAC
(4) EDSAC

59. Which of the following is generally costlier?
(1) Server **[SBI Clerk 2012]**
(2) Notebook computer
(3) Personal computer
(4) Laptop computer
(5) Mainframe

60. Desktop and personal computers are also known as **[SBI Clerk 2012]**
(1) Supercomputers
(2) Servers
(3) Mainframes
(4) Peripheral equipment
(5) Microcomputers

Analyse Yourself

1. (2)	**2.** (4)	**3.** (1)	**4.** (4)	**5.** (2)	**6.** (3)	**7.** (4)	**8.** (3)	**9.** (4)	**10.** (1)
11. (4)	**12.** (1)	**13.** (4)	**14.** (2)	**15.** (5)	**16.** (2)	**17.** (4)	**18.** (2)	**19.** (3)	**20.** (3)
21. (5)	**22.** (1)	**23.** (2)	**24.** (2)	**25.** (4)	**26.** (2)	**27.** (2)	**28.** (1)	**29.** (3)	**30.** (4)
31. (2)	**32.** (1)	**33.** (1)	**34.** (4)	**35.** (3)	**36.** (5)	**37.** (2)	**38.** (3)	**39.** (1)	**40.** (2)
41. (1)	**42.** (5)	**43.** (1)	**44.** (2)	**45.** (1)	**46.** (1)	**47.** (3)	**48.** (3)	**49.** (4)	**50.** (5)
51. (4)	**52.** (2)	**53.** (4)	**54.** (1)	**55.** (2)	**56.** (1)	**57.** (4)	**58.** (1)	**59.** (5)	**60.** (5)