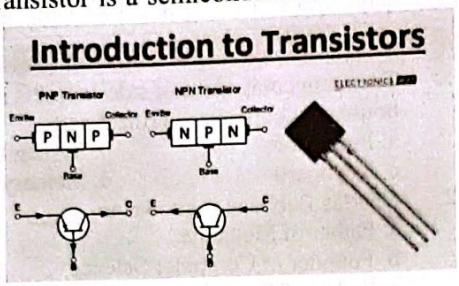
ICT : Lecture-02

Hardware

- Main Components of CPU.
- Computer Memory
- Input, Output and I/O device.
- Virtual Memory
- Cache Memory
- Internet & Internet Protocol
- Cloud Computing
- E-mail, Server, Sensor
- Social Networking

Transistor: A Transistor is a semiconductor device used to amplify or switch electrical signals. It is composed of semiconductor material, usually with three terminals.



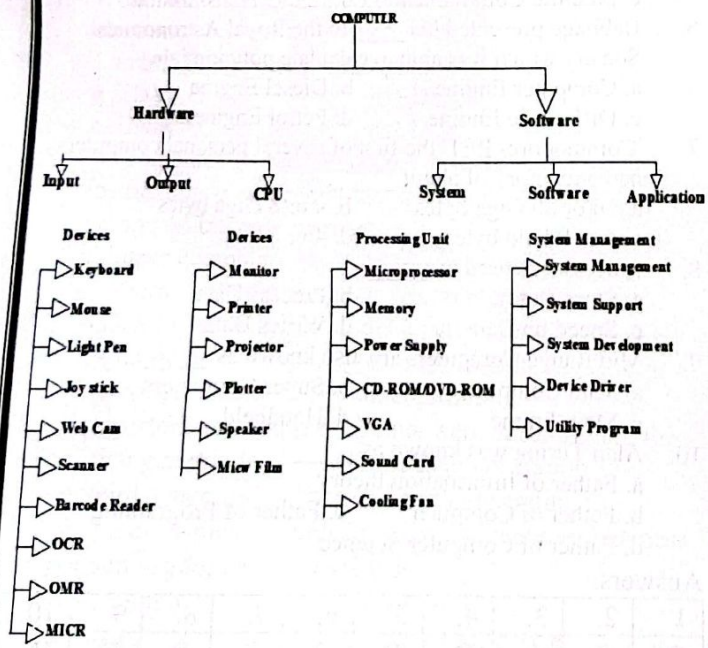
Transistor

John Bardeen, William Shockley and Walter Brattain invented Transistor in 1948 at Bell Lab.

- 1st transistor based computer is TX-0.
- 1st transistor based mini computer is PDP-8.

Integrated Circuit (IC) : Jack kilby invented IC in 1958. First IC based computer is B2500 and B3500. IC based first digital computer is IBM System 360. ICS have two main advantages over discrete circuit: cost and Performance.

IC

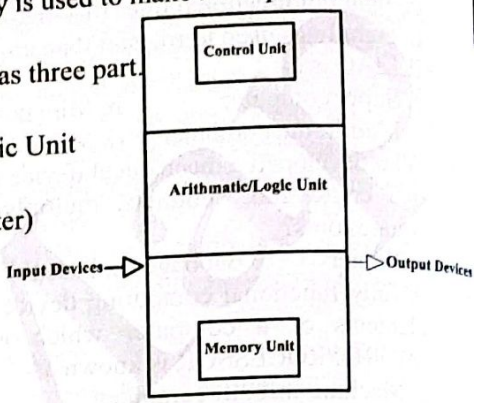


Microprocessor

Dr. Ted Huff invented microprocessor in 1971. 1st microprocessor was Intel 4004. It was a 4 bit processor. 1st microprocessor based computer is Altair 8800. Intel 8080 microprocessor was used there. Very large Scale Integration (VLSI) Technology is used to make microprocessor.

Micro processor was three part.

1. Arithmetic/ Logic Unit
2. Control Unit
3. Memory (Register)



Arithmetic/Logic Unit: It has three parts.

a) Arithmetic part (plus, Minus, Boolean, Operation, Multiplication, Division)
b) Logic Part (AND, OR, NOT, IF ELSE, XOR)
C) Data Transmission.

Control Unit: Control Unit controls there activity of microprocessor (CPU). It works live Traffic Police.

There are three types of microprocessor.

a) CISC: Complex instruction Set Computing
b) RISC: Reduced Instruction Set Computing
c) Special Purpose Microprocessor.

Memory: This memory is called Register. This is the fastest memory of the computer. It is small in size like 8 bits, 16 bits, 32 bits, 64 bits.

Memory hierarchy:

Register > Cache Memory > Main Memory > Secondary Memory (RAM, ROM)

- SSD
- HDD
- Optical Disc
- Magnetic Tap

Input devices

a) Keyboard : Apple keyboard has 109 keys. Other key board has 103-105 keys. There are three layout for English keyboard.
   a) QWERTY (Most popular all over the world)
   b) QWERTZ
   c) AZERTY

Munir Chowdhary invented first Bangla keyboard layout called Munir Optima. Bijoy keyboard was invented by Mustafa Jabbar on 16 December, 1988. Avro keyboard was invented by Dr. Mehadi Hasan in 2003 (26 march). Bijoy is a closed Source Software whereas Avro is an open Source Software.

There are five types of key:

1. Function Key (F1-F12)
2. Alphanumeric Key (A-Z, 0-9)
3. Numeric Key (0-9, +, ×, ÷, total 17)
4. Modifier Key (Shift, ctrl. Alt)
5. Cursor Key (↑ ↓ ← →)

Function Keys:

F1: Help, F2: Rename, F3: Repetition of Previous Command, F4: Last Performed Action Repeats, F5: Page Refresh, Slide Show of ppt. F6: Cursor Moves to internet browser, F7: Synonym, Antonym at MS Word, F8: Safe mode at OS, F9: Fast Boot device, F10: Manu bar Selection, F11: Full Screen, F12: Reboot.

b) **Mouse:** Douglas Engelbart invened Mouse in 1963. It was first used in 1984 at Macintosh Computer. Mouse is called pointing device. It can be used to Click, Drag and Select.

c) **OMR (Optical Mark Reader):** It can read spot of pencil or pen. It is used to assess MCQ Script, census.

d) **OCR (Optical Character Recognition/ Reader):** It scans data and makes them computer character.

e) **MICR (Magnetic Ink Character Reader/ Recognition):** It can read bank Check, Fe_3O_4 is used as ink. It can read more than 2500 Check per minute.

f) **Barcode Reader and QR Code Reader:** Bar code is also called universal product code. QR code means Quick Response Code. QR code is 2D bar code of Matrix.

g) **Light Pen:** It is a Stylus used to draw engineering design and diagram.

h) **Joystick:** It is a input device used to play games.

i) **Digitizer Tablet :** It is used to draw graph, design, map.

j) **Webcam:** It is used for video chatting. VoIP Means Voice over Internet Protocol.

k) **Scanner:** It works like Photocopy Machine. It duplicates the input as image.

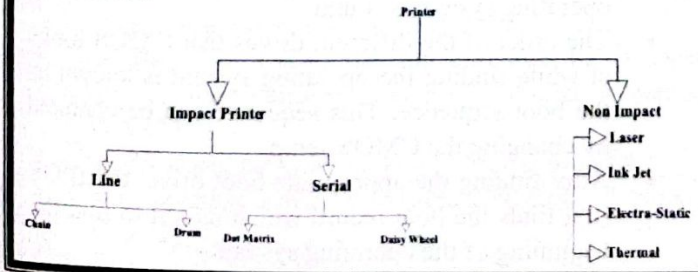
Output Device

a) Monitor: There are fore types of monitor:

a) CRT (Cathode Ray Tube)
b) LCD (Liquid Crystal Display)
c) LED (Light Emitting Diode)
d) Plasma

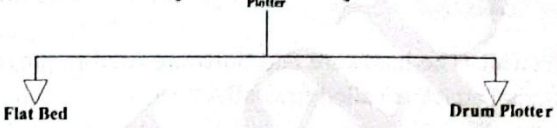
The quality of a monitor is checked by Resolution (Unit: Pixel), aspect ratio (means ratio between horizontal pixel to vertical pixel) and refresh rate (Unit: Frames/Second or FPS or Hertz).

b) Printer:

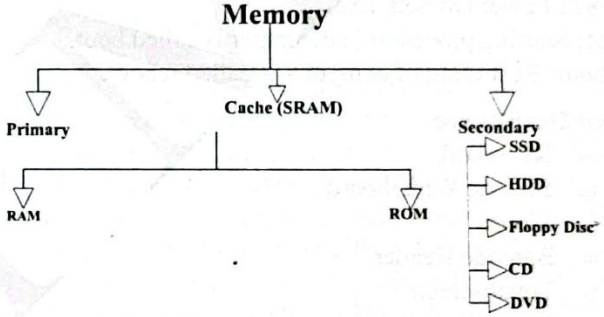


Printer is a offline device. Fastest Printer is Laser Printer. Quality of printer is checked by DPI which means Dot per Inch. In Windows Operating System Ctrl + p is used as Printing Command. Speed of the printer is measured by PPM (Pages Per Minute)

Plotter: Thin or thick pen is used which automatically write according to input.



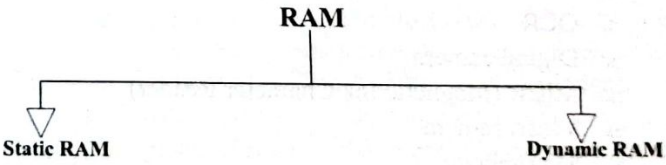
Input-Output device: Modem, Touch Screen, pen drive, Digital Camera are called Input-Output device. Because they can take input and provide output simultaneously.



Bit is the smallest unit of memory.
4bit = 1nibble
8bit = 1 byte
2^{10}bit = 1024 bit = 1 kb

Main memory/Primary Memory : The memory which is directly connected to CPU is called Main Memory.

a) RAM: Random Access Memory
b) ROM: Read Only Memory



i) Expensive	i) Cheap
ii) Fast	ii) Slow
iii) Don't need to Refresh	iii) Need to Refresh
iv) Made of Transistor	iv) Made of Capacitor

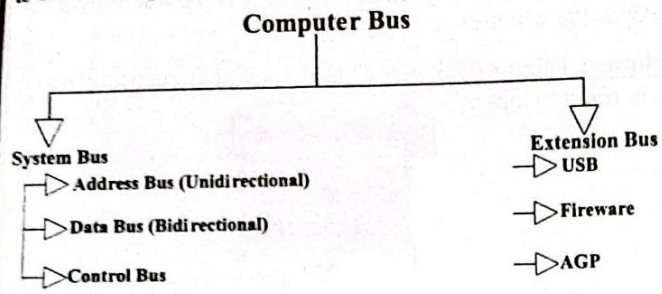
ROM →
- MROM : Mask ROM
- PROM : Programmable ROM
- EROM : Erasable PROM
- EEROM : Electrically EPROM

Cache Memory: It is SRAM. It is located between Microprocessor and RAM. It enhances the Speed of program.

Virtual Memory: When a part of secondary memory is used as primary memory is called virtual memory.

Computer Bus

The conductor which facilitates to conduct through computer is called computer bus.



Firewall: The hardware and Software used to prevent the external attack is called firewall.

Firmware: The Software that permanently stored at ROM is Called FIRMWARRE.
BIOS: Basic Input Output System.
POST: Power On Self Test.
Boot: Starting process of a computer is called boot.
Reboot: Restarting of computer is called reboot.

Input Devices are

- Keyboard
- Electric Whiteboard
- Mouse
- Barcode Reader
- Touchscreen
- Game Pad
- Pen tablet
- Webcam
- Joystick
- Touchpads
- MIDI keyboard
- OMR
- Scanner
- OCR
- Digital camera
- MICR (Magnetic Ink Character Reader)
- Video camera
- Microphone
- Magnetic Tape Drive

Output devices include

- Monitor (LED, LCD, CRT etc.)
- Speakers
- Projector
- Head Phone
- TV screen
- Visual Display Unit
- Printer
- Film Recorder
- Plotter
- Microfiche

Both input and output devices, such as

- External hard drives
- Modems
- Media card readers
- Network cards
- Digital camcorders
- Touch Screen
- Digital mixers
- Facsimile (FAX)
- MIDI equipment

Online Devices: The devices which are directly connected to microprocessor are called online devices. Example: RAM, ROM.

Offline Devices: The devices which are not directly connected to microprocessor are called offline devices. Example: Printers.

Booting

Booting is the process of starting a computer as initiated via hardware such as a button or by a software command. Here are the steps –

- The CPU initializes itself after the power in the computer is first turned on. This is done by triggering a series of clock ticks that are generated by the system clock.
- After this, the CPU looks for the system's ROM BIOS to obtain the first instruction in the start-up program. This first instruction is stored in the ROM BIOS and it instructs the system to run POST (Power On Self Test) in a memory address that is predetermined.
- POST first checks the BIOS chip and then the CMOS RAM. If there is no battery failure detected by POST, then it continues to initialize the CPU.
- POST also checks the hardware devices, secondary storage devices such as hard drives, ports etc. And other hardware devices such as the mouse and keyboard. This is done to make sure they are working properly.
- After POST makes sure that all the components are working properly, then the BIOS finds an operating system to load.
- In most computer system's, the operating system loads from the C drive onto the hard drive. The CMOS chip typically tells the BIOS where the operating system is found.
- The order of the different drives that CMOS looks at while finding the operating system is known as the boot sequence. This sequence can be changed by changing the CMOS setup.
- After finding the appropriate boot drive, the BIOS first finds the boot record which tells it to find the beginning of the operating system.

- After the initialization of the operating system, the BIOS copies the files into the memory. Then the operating system controls the boot process.
- In the end, the operating system does a final inventory of the system memory and loads the device drivers needed to control the peripheral devices.
- The users can access the system applications to perform various tasks.

Without the system boot process, the computer users would have to download all the software components, including the ones not frequently required. With the system boot, only those software components need to be downloaded that are legitimately required and all extraneous components are not required. This process frees up a lot of space in the memory and consequently saves a lot of time.

Registers

Register is a set of flip-flops with each flip-flop adequate for saving one bit of data. An n-bit register has a set of n flip-flops and is adequate for saving any binary data of n bits. In the flip-flops, a register can have combinational gates that implement specific data-processing operations. Registers are used as the memory of microprocessor.

Registers in the microprocessor can be classified as –

- General Purpose Registers
- Temporary Registers: a) Temporary data register
  b) W and Z registers
- Special Purpose Registers: a) Accumulator
  b) Flag registers
  c) Instruction register
- Sixteen-bit Registers: a) Program Counter (PC)
  b) Stack Pointer (SP)

Semiconductor (Si, Ge) > P type & N type > PN Junction Diode > Transistor > Logic Gates > Flip-Flop > Counter & Register > Computer

Moore's Law

The number of transistors on a microchip doubles about every two years, though the cost of computers is halved.

Previous Year Questions

1. Which is used to measure the clock speed of the CPU per second? Ans. Gigahertz (Combined 5 banks, 25.3.22)
2. MICR stands for _____. Ans: Magnetic Ink Character Reader (Karmasansthan Bank, 1.4.22)
3. In Microsoft Excel, the function key F2 is used for___. Ans: editing a cell (Combined 5 banks, 11.3.22)
4. In MS word, the shortcut key Ctrl+N is used for____. Ans: opening a new document(Combined 5 banks, 11.3.22)
5. In MS word, the shortcut key Ctrl+O is used for____. Ans: opening a document(Combined 5 banks, 25.3.22)
6. Which of the following is used to select whole document? Ans: Ctrl+A (Combined 5 banks, 25.3.22)
7. In a plasma display, gas is electrified by grid_____. Ans: Electron (Sonali and Janata Bank, 2.10.20)
8. The output quality of a printer is measured by____. Ans: Dots per inch (Combined 5 banks, 25.3.22)
9. Printed output from a computer is called____. Ans: Hard copy (Karmasansthan Bank, 1.4.22)
10. বাংলা টাইপ ও কম্পোজ সফটওয়্যার —— বিজয় (Karmasansthan Bank, 1.4.22)
11. Which one is not considered as a form of secondary memory___. Ans: RAM(Combined 5 banks, 11.3.22)
12. Which Technology has made possible to pinpoint precision to the optical storage____. Ans: Laser beams (BB 7.2.2020)
13. ডিস্ক ডিফ্রাগমেন্টশন ব্যবহৃত হয়— ডিস্কের ফাইলগুলোকে পুনর্বিন্যস্ত করতে (Karmasansthan Bank, 1.4.22)
14. In MS word, pressing F8 key for three times selects_____. Ans: a sentence (Dhaka bank, 5.2.21)
15. Which factors are affecting the processing speed of a computer? Ans: Cache Memory, Clock Speed, RAM. (Sonali and Janata Bank, 2.10.20)
16. How many generations are available for USB specifications? Ans: Four (BB 7.2.2020)
17. In computers, why is Firewall used? Ans: Authentication (Sonali and Janata Bank, 2.10.20)
18. USB stands for? → Universal Serial Bus (NSI AD 2016)
19. A bar code reader emits—.
    a) sound b) light
    c) beeps d) smell Ans:b
    [Officer (IT) 2020 [MCQ] Sonali Bank Ltd/Janata Bank Ltd]
20. In a plasma display, gas is electrified by grid of—.
    a) electronics b) phosphors
    c) electron d) electrodes Ans:b
    [Officer (IT) 2020 [MCQ] Sonali Bank Ltd/Janata Bank Ltd]
21. — are introduced in Fourth Generation Computers:
    a) Microprocessors b) Vacuum Tubes
    c) Integrated Circuits d) None of these Ans:a
    [4 Govt. Banks Officer (General) 2019]
20. Which one is called the brain of computer?
    a) RAM b) ALU
    c) CPU d) None of these Ans:c
    [4 Govt. Banks Officer (General) 2019]
21. Which of the following is not an input device?
    a) Plotter b) Keyboard
    c) Scanner d) All of these Ans:a
    [4 Govt. Banks Officer (General) 2019]
22. Which one is the largest space?
    a) Gigabyte b) Petabyte
    c) Terabyte d) None of these Ans:b
    [4 Govt. Banks Officer (General) 2019]

23. Which operation does F1 key perform for all types of application? Ans: Help [Sonali and Janata Bank, 2.10.20]
24. Which one is not contained in MICR code? Ans: Country Code [Sonali and Janata Bank, 2.10.20]
25. A barcode reader emits? → Lights [NSI AD 2016]
26. MS word document-এ ১টি Specific word বের করতে কোন command ব্যবহার করা হয়? → Ctrl + F (বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড)
27. MS wordএ নতুন Window খোলার জন্য কোন Short-cut Command ব্যবহার করা হয়? → Ctrl + N (বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড)
28. প্রতিটি শব্দ আলাদাভাবে Underline করার কমান্ড হলো→ Ctrl + U (বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড)
29. All the mathematical and logical calculations performed by the computer is done by its→ CPU (জনতা ব্যাংক এক্সিকিউটিভ অফিসার ২০১৭)
30. মডেমের ভিতর যা থাকে তা হলো? → একটি মডুলেটর ও একটি ডিমডুলেটর [৩২ বিসিএস, সহঃ সার্ভে অফিসার-২০১৫]
31. Which of the following processors use RISC technology? → Power PC
32. RISC stands for____. → Reduced instruction set computer
33. Floppy disks which are made from flexible plastic material are also called? → Diskettes (Bangladesh Bank Cash officer 2016)
32. Which of the following is an example of optical storage device → CD-ROM. (পল্লী বিদ্যুৎ সহকারী পরিচালক ২০১৭)
35. CD-ROM stands for → Compact Disk Read Only Memory (জনতা ব্যাংক এক্সিকিউটিভ অফিসার ২০১৭)
36. RAM stands for → Random Access Memory
37. ROM-এর পূর্ণরূপ কী? → Read Only Memory
38. ROM কাকে বলে? → কম্পিউটারের স্থায়ী স্মৃতিকে ROM বলে
39. কম্পিউটার মেমরি থেকে সংরক্ষিত ডাটা উত্তোলনের পদ্ধতিকে কী বলে? → Read
40. RAM-এর পূর্ণরূপ কী? → Random Access Memory
41. RAM বলতে কী বোঝায়? → কম্পিউটারের কর্ম এলাকা বোঝায়। এটি একটি অস্থায়ী স্মৃতি।
42. Type of plotter in which a paper is held on a rotating drum and lines are drawn with pen movements is classified as → drum plotter
৪৩. কম্পিউটারের প্রিন্টার লেজার জেট উদ্ভাবিত হয় কত সালে? → ১৯৮৪ সালে
44. Display screen in which text is displayed in one color and background is displayed by another single color is called → monochrome screen
45. Marker on computer screen which is used to show current position of user is called → cursor
46. Display technology that uses gas between two glass sheets is classified as → plasma displays
New technology named 'LED' is abbreviation of → light-emitting diodes
47. কম্পিউটার সিস্টেমে স্ক্যানার একটি কোন ধরনের ডিভাইস? → ইনপুট
48. কম্পিউটারে মাউস এর আবিষ্কারক কে → ডগলাস এঙ্গেলবার্ট
49. কম্পিউটারের কী-বোর্ডের আবিষ্কারক কে → ক্রিস্টোফার ল্যাথাম
50. কোনটি ইনপুট ডিভাইস → OMR
51. OMR-এর পূর্ণরূপ কি → Optical Mark Reader
52. ইনপুট কাকে বলে? → প্রোগ্রাম ও ডাটা গ্রহণকারী কম্পিউটারের অংশ
53. এমএস ওয়ার্ডে কাজ করার সময় কোনো নির্দেশ বাতিল করার জন্য কোন বোতামে চাপ দিতে হয়? →Esc
54. এমএস ওয়ার্ডে প্রিন্ট কমান্ড কোনটি? → Ctrl + P
55. কী-বোর্ডের f1-f12 পর্যন্ত বোতামগুলোকে কি বলে? → ফাংশন কী
56. সিরিয়াল পোর্টমাউসে পিন থাকে → ৯টি
57. বিজয় লে আউটে দ বর্ণটি লিখতে কি বোর্ডের কোন বোতাম চাপতে হয়? → L
58. একটি যোগ করতে কম্পিউটারের ৫০ ন্যানো সেকেন্ড লাগলে সেকেন্ডে এটা কতটা যোগ করতে পারবে? → ২ কোটি
59. নিউমেরিক কী-প্যাড কোথায় থাকে? → কী বোর্ডের ডান দিকে
60. Which of the following is the save button in computer keyboard? → F12 (Sonali Bank IT Officer 2016)
61. MICR stands for → Magnetic Ink Character Recognition (Bangladesh Bank Cash officer 2016)

PRACTICE YOURSELF (SET-1)

1. **What is Unicode?**
   a) Standard Font b) Software
   c) Character Encoding System
   d) Keyboard Layout
2. **In Computer System Scanner is _____ Device?**
   a Input b) Output
   c) Both d) None
3. **Which of the following memory has the shortest access time?**
   a) Virtual Memory b) Cache Memory
   c) External Memory d) Register
4. **4. Speed of Laser Printer is measured in-**
   a) LPM b) PPM
   c) DPI d) DPS
5. **Which of the following device cannot be shared in Network?**
   a) CD Drive b) Printer
   c) Mouse d) Hard Disk
6. **Which of the following is not Computer Hardware?**
   a) Mouse b) Monitor
   c) Antivirus d) Printer
7. **What is the main purpose of the secondary storage device?**
   a) To increase the speed of
   b) To Install Operating System
   c) To Networking Computer
   d) To Store Data
8. **Which of the following memories needs refresh?**
   a) DRAM b) SRAM
   c) ROM d) All of above

9. **A Dumb terminal has-**
   a) Processor and Keyboard
   b) Processor and Hard Disk
   c) Keyboard and Hard Disk
   d) Keyboard and Screen
10. **Who invented Integrated Circuit (IC)?**
   a) Herman Hollerith b) Jack Kilby
   c) Semen Korsakov d) Bill Gates

1	2	3	4	5	6	7	8	9	10
c	a	b	b	c	c	d	a	d	b

PRACTICE YOURSELF (SET-2)

1. **Which device is used as the standard pointing device in a Graphical User Environment?**
   a) Keyboard b) Mouse
   c) Joystick d) Track ball
2. **Which number system is usually followed in a typical 32-bit computer?**
   a) 2 b) 10
   c) 16 d) 32
3. **Which number system is usually followed in a typical 32-bit computer?**
   a) Binary b) Decimal
   c) Hexadecimal d) Octal
4. **Which of the following is not an output device?**
   a) Scanner b) Printer
   c) Flat Screen d) Touch Screen
5. **Which of the following devices have a limitation that we can only store information to it but cannot erase or modify it?**
   a) Floppy Disk b) Hard Disk
   c) Tape Drive d) CDROM
6. **Which technology is used in Compact disks?**
   a) Mechanical b) Electrical
   c) Electro Magnetic d) Laser
7. **Which of the following storage devices can store maximum amount of data?**
   a) Floppy Disk b) Hard Disk
   c) Compact Disk d) Magneto Optic Disk
8. **Which of the following is the largest manufacturer of Hard Disk Drives?**
   a) IBM b) Seagate
   c) Microsoft d) 3M
9. **The programs which are as permanent as hardware and stored in ROM is known as-**
   a) Hardware b) Software
   c) Firmware d) ROM ware
10. **Memory is made up of-**
   a) Set of wires b) Set of circuits
   c) Large number of cells d) All of these

1	2	3	4	5	6	7	8	9	10
b	A	a	a	d	d	b	b	c	c

PRACTICE YOURSELF (SET-3)

1. **The transistorized computer circuits were introduced in the-**
   a) First generation b) Second generation
   c) Third generation d) Fourth generation
2. **Which of the following is required when more than one person uses a central computer at the same time?**
   a) Terminal b) Light pen
   c) Digitize d) Mouse
3. **Which of the following memories has the shortest access time?**
   a) Cache memory
   b) Magnetic Bubble memory
   c) Magnetic core memory
   d) RAM
4. **An output device that uses words or messages recorded on a magnetic medium to produce audio response is...**
   a) Magnetic tape b) Voice response unit
   c) Voice recognition unit d) Voice band
5. **Typical data transfer rates in LAN are of the order of-**
   a) Bits per sec b) Kilo bits per sec
   c) Mega bits per sec d) None of the above
6. **The two types of computer chips are-**
   a) External memory Chip b) Primary memory Chip
   c) Micro processor chips d) Both A and B
7. **Programs designed to perform specific tasks is known as-**
   a) System software b) Application Software
   c) Utility Programs d) Operating system
8. **A plastic card similar to a credit card but having some memory and a micro processor embedded within it is...**
   a) Punch Paper Tape b) Chip Card
   c) Card Punch d) Magnetic Tape
9. **A network topology in which the outer nodes connect to a single central node is....**
   a) LAN b) Broadband network
   c) Passive star d) Pass band
10. **The central processing unit(CPU) consists of-**
   a) Input, output and processing
   b) Control unit, Primary storage and secondary storage
   c) Control unit arithmetic-logic unit, and primary storage
   d) Control unit, processing, primary storage

1	2	3	4	5	6	7	8	9	10
b	a	b	b	c	d	c	a	C	d

Internet

The Internet (or internet) is the global system of interconnected computer networks that uses the Internet protocol suite (TCP/IP) to communicate between networks and devices. It is a network of networks that consists of private, public, academic, business, and government networks of local to global scope, linked by a broad array of electronic, wireless, and optical networking technologies. The Internet carries a vast range of information resources and services, such as the inter-linked hypertext documents and applications of the World Wide Web (WWW), electronic mail, telephony, and file sharing.

Internet Protocol

Internet Protocol (IP) is the method or protocol by which data is sent from one computer to another on the internet. Each computer known as a host on the internet has at least one IP address that uniquely identifies it from all other computers on the internet.

IP Address: A logical numeric address that is assigned to every single computer, printer, switch, router or any other device that is part of a TCP/IP-based network.

Subnet: A separate and identifiable portion of an organization's network, typically arranged on one floor, building or geographical location.

Subnet Mask: A 32-bit number used to differentiate the network component of an IP address by dividing the IP address into a network address and host address.

Network Interface Card (NIC): A computer hardware component that allows a computer to connect to a network.

IPV4: Internet Protocol Version 4 (32 bit)
IPV6: Internet Protocol Version 6 (128 bit)

Cloud computing

Cloud computing is the delivery of different services through the Internet, including data storage, servers, databases, networking and software. Cloud-based storage makes it possible to save files to a remote database and retrieve them on demand. Services can be both public and private—public services are provided online for a fee while private services are hosted on a network to specific clients.

Types of Cloud Computing: Cloud computing is not a single piece of technology like a microchip or a cellphone. Rather, it's a system primarily comprised of three services: software-as-a-service (SaaS), infrastructure-as-a-service (IaaS) and platform-as-a-service (PaaS).

Software-as-a-service (SaaS) involves the licensure of a software application to customers. Licenses are typically provided through a pay-as-you-go model or on-demand. This type of system can be found in Microsoft Office's 365.

Infrastructure-as-a-service (IaaS) involves a method for delivering everything from operating systems to servers and storage through IP-based connectivity as part of an on- demand service. Clients can avoid the need to purchase software or servers, and instead procure these resources in an outsourced, on-demand service. Popular examples of the IaaS system include IBM Cloud and Microsoft Azure.

Platform-as-a-service (PaaS) is considered the most complex of the three layers of cloud-based computing. PaaS shares some similarities with SaaS, the primary difference being that instead of delivering software online. It is actually a platform for creating software that is delivered via the Internet. This model includes platforms like Salesforce.com and Heroku.

Cloud Service Provider:

1. Google Cloud
2. Amazon Web Services (AWS)
3. Microsoft Azure4. IBM Cloud
5. Alibaba Cloud

According to NIST, five essential characteristics of Cloud Computing:

1. On demand self-service
2. Broad network access
3. Resource pooling
4. Rapid Elasticity
5. Measured service

According to ISO 17788 six essential characteristics of Cloud Computing

1. On demand self-service
2. Broad network access
3. Resource pooling
4. Rapid Elasticity
5. Measured service
6. Multi-tenancy

E-mail

Electronic mail (or e-mail or email) is an Internet service that allows people who have an e-mail address (accounts) to send and receive electronic letters. Those are much like postal letters, except that they are delivered much faster than snail mail when sending over long distances, and are usually free. Like with regular mail, users may get a lot of unwanted mail. With e-mail, this is called spam. Some programs used for sending and receiving mail can detect spam and filter it out nearly completely.

A valid email address consists of an email prefix and an email domain, both in acceptable formats. The prefix appears to the left of the @ symbol. The domain appears to the right of the @ symbol. For example, in the address example@mail.com, "example" is the email prefix, and "mail.com" is the email domain.

Email Address Format

firstlastname@example.com

Username Domain

Protocol followed to send e-mail: SMTP
Protocol followed to receive e-mail: POP, POP3, IMAP
SMTP=Sending Mail Transfer Protocol
POP=Post Office Protocol
IMAP=Internet Message Access Protocol

Sensor: A sensor is a device, module, machine, or subsystem that detects events or changes in its environment and sends the information to other electronics, frequently a computer processor. Sensors are always used with other electronics

Previous Year Questions

1. In which folder the unwanted mails are stored: Ans: Spam (Combined 5 banks, 25.3.22)
2. Which one of the following protocols is used for receiving e-mails? Ans: POP3 [Officer (IT) 2020 [MCQ] Sonali Bank Ltd/Janata Bank Ltd]
3. ARPANET Stands for_____Ans: Advance Research Project Agency Network (BB 7.2.2020)
4. Which one of the following protocols is used for receiving e-mails? Ans: POP3 (Sonali and Janata Bank, 2.10.20)
5. Which protocol is used to send a destination network unknown message back to the originating host? Ans: ICMP (Rupali Bank, 6.3.21)
6. The newest version of HTML is _____Ans: HTML5 (Sonali and Janata Bank, 2.10.20)
7. Every computer connected to the Internet is identified by a unique four-part string, known as- IP Address [Officer (General) 2019 24.05.2019; Set : B]
8. ইন্টারনেটের জনক কে? → ভিনটন জি কার্ফ [পল্লী উন্নয়ন কর্মকর্তা ২০১৫]
9. কম্পিউটার টু কম্পিউটার তথ্য আদান-প্রদানের প্রযুক্তিকে বলে?→ ইন্টারনেট [৩১, ৩০, ২৪ বিসিএস]
10. কম্পিউটারকে ইন্টারনেটে যুক্ত করতে নিচের কোনটি প্রয়োজন? → মডেম [দুদক উপ সহঃ পরিচালক-২০১০]
11. বর্তমানে যে প্রটোকলের মাধ্যমে ইন্টারনেট ব্যবহার করে টেলিফোন করা যায় তার নাম? → ভয়েস ওভার আইপি [সহঃ সার্ভে অফিসার-২০১০]
12. টেলেক্স-এর মাধ্যমে নিচের কোনটি?→ শব্দ বা ছবি [সমাজসেবা অধিদপ্তর প্রবেশন অফিসার- ২০১৩]
13. জাতীয় ই-তথ্য কোষ উদ্বোধন করা হয়? → ২৭ ফেব্রুয়ারি ২০১১ [প্রাথমিক শিক্ষক নিয়োগ-২০১৫]
14. Internet Corporation For Assigned Names And Number–ICANN-এর প্রতিষ্ঠা কবে? → ১৮ সেপ্টেম্বর ১৯৮৮ সালে (সদর দপ্তর ক্যালিফোর্নিয়া)
15. ইন্টারনেট জগতের প্রথম ডোমেইনের নাম কি? → ডট কম
16. বাংলাদেশে ইন্টারনেটর চালু হয় কখন? → ১৯৯৬ সালে
17. ইন্টারনেটের মাধ্যমে প্রদত্ত চিকিৎসা পদ্ধিতিকে কি বলে? → টেলি মেডিসিন
18. ইন্টারনেট সার্চ ইঞ্জিনের জনক কে? → এলান এমটাজ
17. In FTP, ASCII, EBCDIC, and image define an attribute called → file type
18. The third stage in an email transfer needs a _____ protocol. → pull
19. In the _____ mode, each character typed is sent by the client to the server. → character
20. The _____ is software residing on the remote system that allows the remote system to receive characters from a TELNET server. → pseudo terminal driver
21. FTP uses the services of _____. → TCP
22. For the control connection, FTP uses the _____ character set. → NVT ASCII
23. In FTP, when we _____ , it is copied from the client to the server. → store a file
24. During an FTP session the data connection is opened _____. → as many times as necessary
25. MIME stands for → Multipurpose Internet Mail Extensions
26. File Transfer Protocol (FTP), uses same operation used by → TCP
27. ইন্টারনেট চালুর বছর? → ১৯৬৯ [৩৩ বিসিএস, ৮ম শিক্ষক নিবন্ধন-২০১২, সহঃ রাজস্ব কর্মকর্তা-২০১৫]
28. কোন ই-মেইল ঠিকানায় নিচের কোন চিহ্নটি অবশ্যই থাকে? →@ [খাদ্য অধিদপ্তরের উপ-পরিদর্শক-২০১২]
29. ইন্টারনেটে চিঠি পাঠানোর জন্য নিচের কোন প্রোগ্রাম ব্যবহার করা হয়? → জি-মেইল [সাঁটলিপিকার ২০০৯]
30. ই-মেইল কে আবিষ্কার করেন? → রে টমলিসন
31. ই-মেইল অ্যাড্রেসে @ দ্বারা কি বোঝানো?→at
32. ই-মেইল অ্যাড্রেসে cc-এর অর্থ কি? →carbon copy
33. ই-মেইল অ্যাড্রেসে bcc-এর অর্থ কি? →blind carbon copy
34. ই-মেইল ঠিকানার @ পরের অংশটিকে কী বলে? →ডোমেন নেম
35. ই-মেইল অ্যাড্রেসের অংশ কয়টি? → ২টি
36. E-mail এর পূর্ণরূপ কি? →Electronic Mail
37. ই-মেইল ঠিকানা কয়ভাগে বিভক্ত? → দুই ভাগে
38. নির্দিষ্ট অবস্থানে থেকে বিভিন্ন অবস্থানের ব্যক্তির সাথে একত্রে দেখা ও কথা বলার জন্য যে প্রযুক্তি ব্যবহার করা হয় তাকে কি বলে? → ভিডিও কনফারেন্স
39. Which of the following protocol is used for e-mail services. → SMTP
40. _____ is the incoming e-mail server. → POP
41. _____ is a uniform naming scheme for locating resources on the web. → URL
42. The actual mail transfer is done through _____. → MTAs
43. If the sender wants an option enabled by the receiver, it sends a command. → DO
44. The _____ usually contains the sender address, the receiver address, other information. → envelope

45. NVT uses two sets of characters, one for ___ and one for A) sending; receiving _____. → data; control
46. In architecture of e-mail, we can have → 6 Scenarios
47. In EMAIL, We need two VAs and two pairs of MTAs, When sender is connected to mail server via → LAN and WAN
48. Mail access starts with client when user needs to download e-mail from the → Mail Box
49. When sender and receiver of an e-mail are on same system, we need only two → User Agents
50. Mail access starts with client when user needs to download e-mail from the → Mail Box
51. ELNET is a general-purpose → Client/server application program
52. Examples of GUI based user agents are Eudora, netscape and → Outlook
53. In electronic mail, MTA transfers mail across Internet via → LAN, WAN
54. MTA stands for → Message transfer agents and
55. Post Office Protocol, version 3 (POP3) is simple and limited in → Functionality
56. Which of the following buttons allows you to access email in Outlook? → Mail
57. The Outlook Contacts functions as a database, which is a(n) _____. → collection of information
58. The Outlook To-Do list includes tasks and _____. → emails that are flagged for action
59. Which Outlook function is similar to using sticky notes? → Notes
60. The Outlook interface is made up of multiple → Panes
61. Which pane allows you to switch between Mail, Calendar, People, and Tasks? → Navigation pane
62. Which pane displays content associated with the sender of a selected email message → People pane
63. Which type of email account is typically used in business settings? → Microsoft Exchange
64. Which type of personal email account downloads email message to your computer? → POP3

Practice Yourself

1. **Voice mail, E-mail, Online service, the Internet and the WWW are all example of-**
   a) Computer categories b) Connectivity
   c) Telecommuting d) None of the above
2. **IRC stands for-**
   a) Internet Resource Channel
   b) Internet Routing Channel
   c) Internet Rights Council
   d) Internet Relay Chat
3. **SMTP is a simple-**
   a) TCP protocol b) TCP/IP protocol
   c) IP protocol d) None of the above
4. **A simple protocol used for fetching e-mail from a mailbox is**
   a) POP2 b) POP3
   c) IMAP d) None of the above
5. **E-mail address is made up of-**
   a) Single part b) Two parts
   c) Three parts d) Four parts
6. **SMTP stands for-**
   a) Short Mail Transmission Protocol
   b) Small Mail Transmission Protocol
   c) Server Mail Transfer Protocol
   d) Simple Mail Transfer Protocol
7. **The E-mail component of Internet Explorer is called-**
   a) Message box b) Outlook Express
   c) Messenger Mailbox d) None of the above
8. **Messenger Mailbox is present in-**
   a) Internet Explorer
   b) Netscape Communicator
   c) Both (A) and (B) d) None of the above
9. **A Separate file sent a part of an email message is called?**
   a) Folder b) Spreadsheet
   c) Attachment d) Message body
10. **In what year was the @ chosen for its use in email address?**
    a) 1972 b) 1976
    c) 1980 d) 1984
11. **Unauthenticated and unwanted mails are store in-**
    a) Inbox b) Sent box
    c) Spam d) Draft box
12. **In a relation to using internet, what is a spam?**
    a) Search engine b) Web browser
    c Unsolicited email d) Web bug
13. **Which of the following symbol must exist in an email?**
    a) # b) @
    c) ^ d) &
14. **What does 'bbb' in an email address aaa@bbb.ccc indicate?**
    a) TCP/IP layer name b) Domain name
    c) Domain Type d) Protocol Name
15. **Email is a protocol of the following layer?**
    a) Physical layer b) Data link layer
    c) Application layer d) TCP layer
16. **POP3 is protocol for-**
    a) Email sending b) Email Receiving
    c) Email Composing d) Email Sorting

Answers:

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
c	d	a	b	b	d	b	B	c	a
11.	12.	13.	14.	15.	16.				
c	c	b	b	c	b				