KENDRIYA VIDYALAYA SANGATHAN KVS

PGT

POST GRADUATE TEACHER

COMPUTER SCIENCE

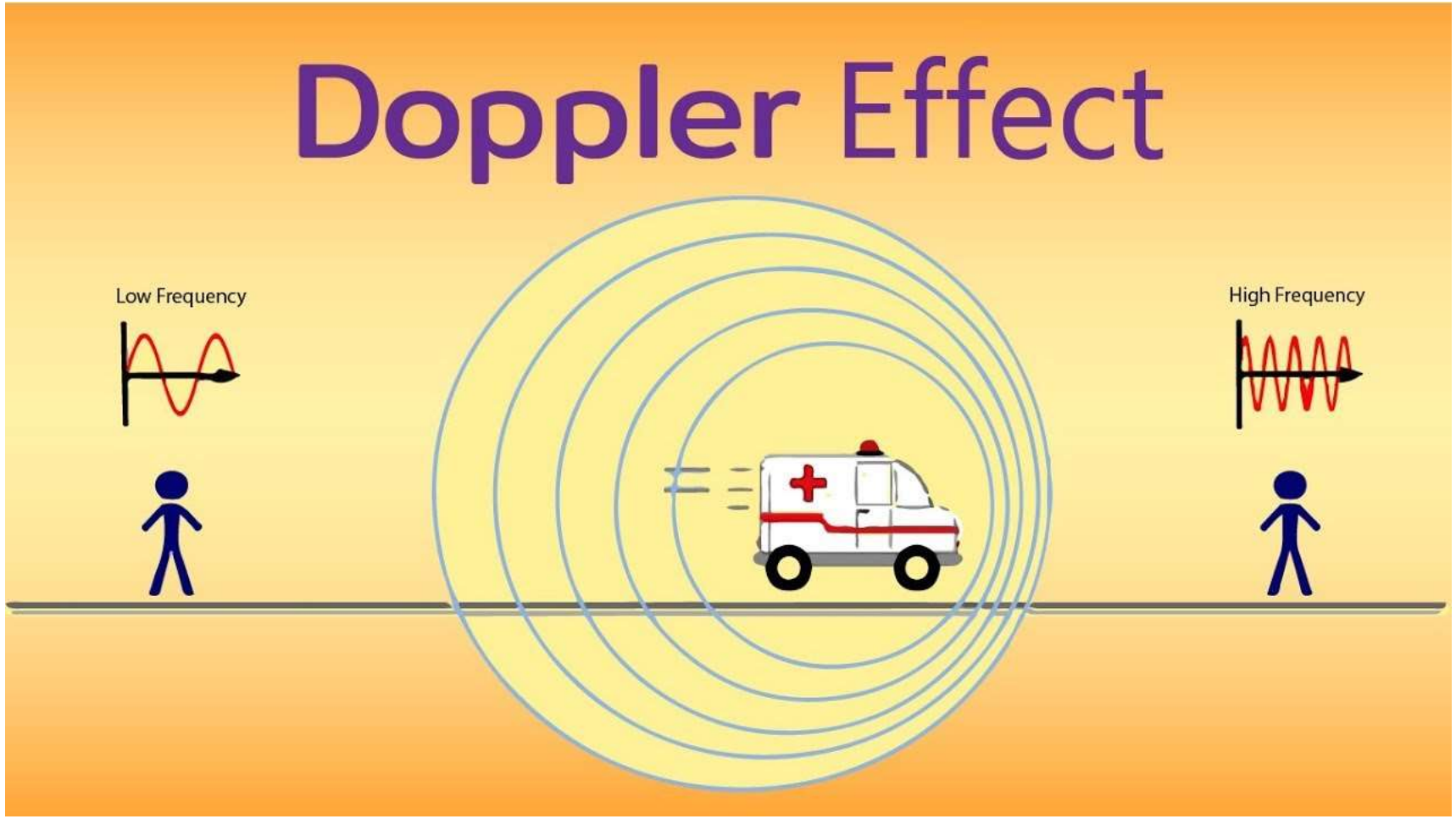
101. When the object making the sound is moving towards you, the frequency goes up due to the waves getting pushed more tightly together. The opposite happens when the object moves away from you and the pitch goes down. This phenomenon is called

(1) Band width.
(2) Doppler effect.
(3) Sound refraction.
(4) Vibrations.

101. जब कोई लक्ष्य ध्वनि उत्पन्न करता हुआ आप की ओर गतिमान हो, तब तरंगों में परस्पर अधिक कसावटपूर्ण दबाव होने के कारण, आवृत्ति उच्चतर होती जाती है । इसका विपरीत तब होता है जब लक्ष्य आप से दूर गतिमान हो तथा पिच निम्नतर होने लगती है । यह घटना कहलाती है

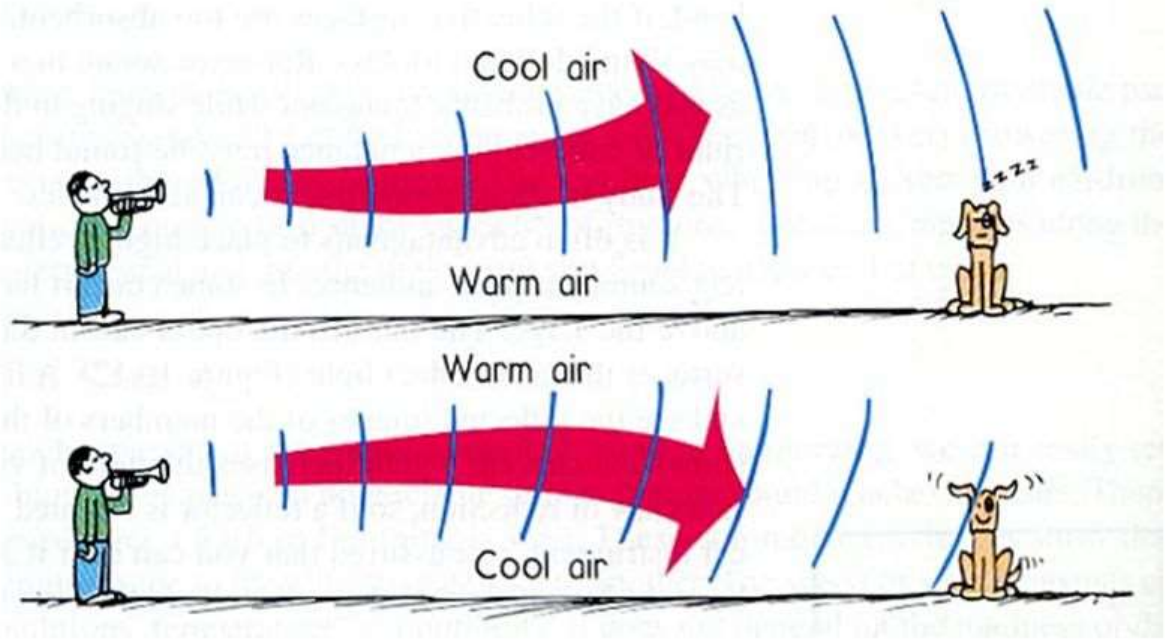
(1) पट्टिका चौड़ाई
(2) डॉप्लर प्रभाव
(3) ध्वनि अपवर्तन
(4) कंपन

Doppler Effect



An increase (or decrease) in the frequency of sound, light, or other waves as the source and observer move towards (or away from) each other. The effect causes the sudden change in pitch noticeable in a passing siren, as well as the red shift seen by astronomers.

Refraction of Sound

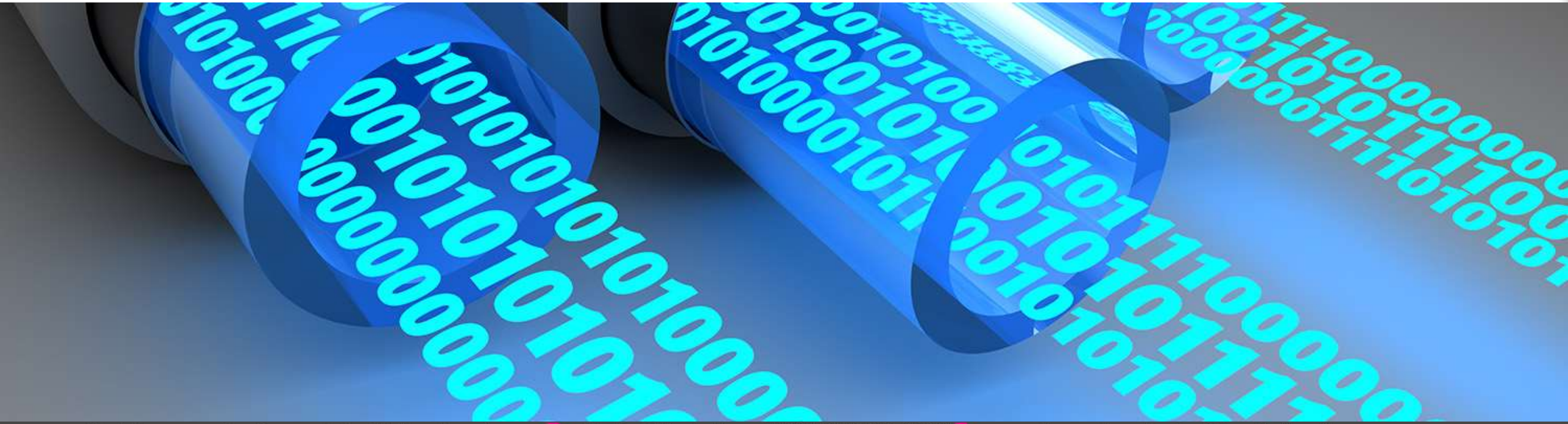


Refraction of Sound Waves.
Refraction of waves involves a change in the direction of waves as they pass from one medium to another. Refraction, or bending of the path of the waves, is accompanied by a change in speed and wavelength of the waves

Vibration is a mechanical phenomenon whereby oscillations occur about an equilibrium point. The word comes from Latin vibrationem ("shaking, brandishing").

Bandwidth

A range of frequencies within a given band, in particular that used for transmitting a signal.



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(1) पट्टिका चौड़ाई
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(3) ध्वनि अपवर्तन
(4) कंपन

102. Even when the screen is completely dark while the film is in motion, commercial motion pictures use

(1) 32 frames per second or 102 screen illuminations per second.
(2) 72 frames per second or 234 screen illuminations per second.
(3) 8 frames per second or 32 screen illuminations per second.
(4) 24 frames per second or 72 screen illuminations per second.

102. यद्यपि जब परदा पूर्णरूपेण स्याह हो जबकि फिल्म चल रही हो, व्यावसायिक चल-चित्रों में प्रयुक्त होता हैं

(1) 32 फ्रेम प्रति सेकण्ड अथवा 102 स्क्रीन प्रदीपन प्रति सेकण्ड
(2) 72 फ्रेम प्रति सेकण्ड अथवा 234 स्क्रीन प्रदीपन प्रति सेकण्ड
(3) 8 फ्रेम प्रति सेकण्ड अथवा 32 स्क्रीन प्रदीपन प्रति सेकण्ड
(4) 24 फ्रेम प्रति सेकण्ड अथवा 72 स्क्रीन प्रदीपन प्रति सेकण्ड

103. Internet Control Message Protocol (ICMP)

(1) allows gateways to send error control messages to other gateways or hosts.

(2) provides communication between the Internet Protocol Software on one machine and the Internet Protocol Software on another.

(3) only reports error conditions to the original source, the source must relate errors to individual application programs and take action to correct the problem.

(4) All of these

103. इन्टरनेट कंन्ट्रोल मैसेज प्रोटोकॉल (ICMP)

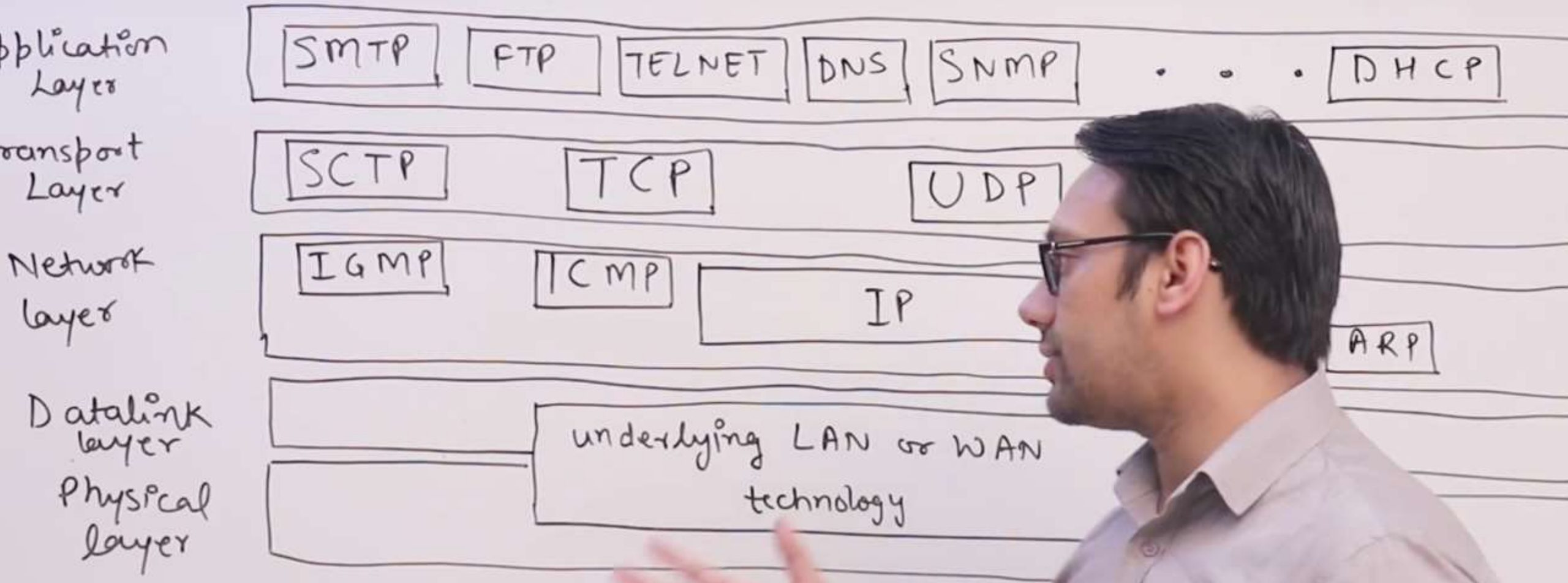
(1) गेटवेज को अन्य गेटवेज या मेजबान को त्रुटि नियंत्रण संदेश प्रेषित करने देता है ।

(2) एक मशीन में इंटरनेट प्रोटोकॉल साफ्टवेयर तथा अन्य के इन्टरनेट प्रोटोकॉल सॉफ्टवेयर के बीच संचार प्रदान करता है ।

(3) मूल स्रोत को केवल त्रुटियों की परिस्थितियाँ सूचित करता है । स्रोत को त्रुटियों को पृथक-पृथक प्रयुक्ति प्रोग्रामों से जोड़ना होता है और समस्या को सुधारने के लिए कदम बढ़ाता है ।

(4) उपरोक्त सभी

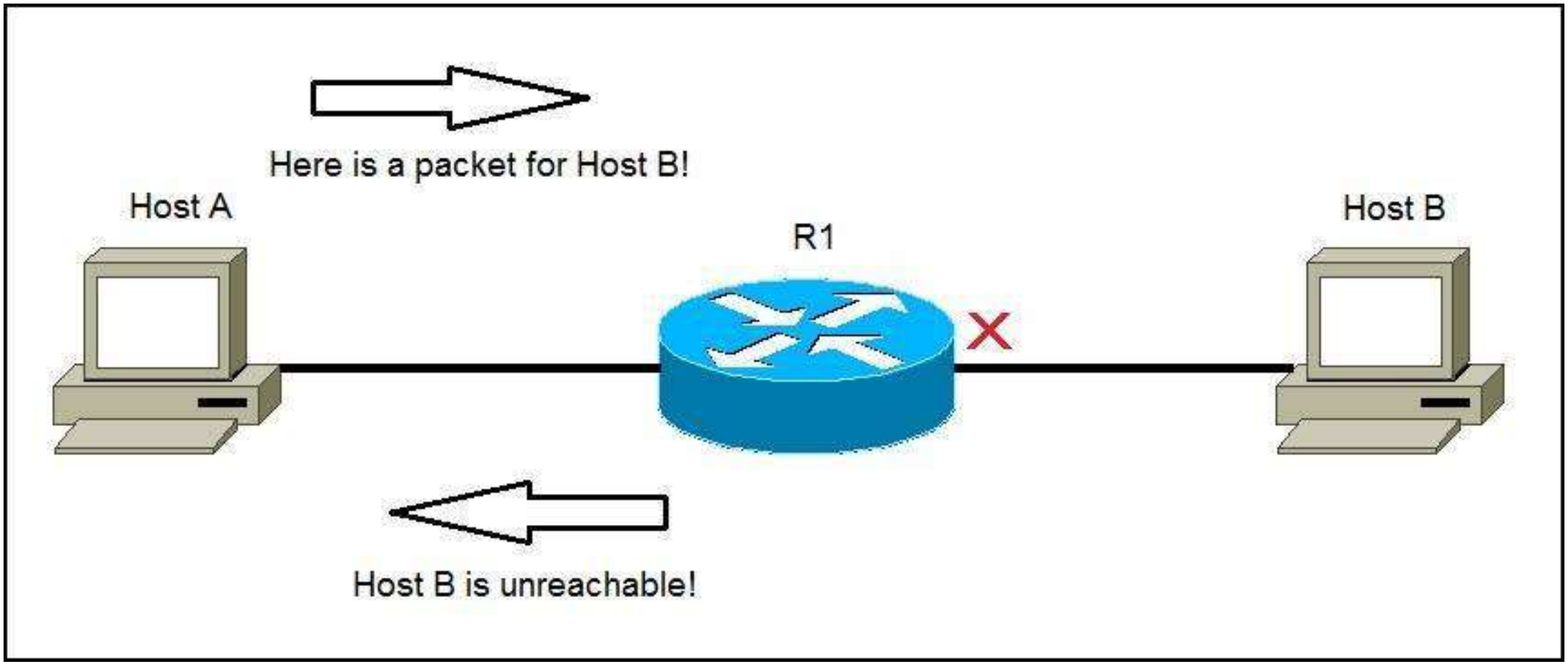
Position of IP and other network-layer protocols in TCP/IP protocol s



→ IPv4 is an unreliable datag… …ol - a bes… …P…

IPv4 + TCP → …ty.

→ IPv4 is Connection less


Here is a packet for Host B!
Host A
R1
Host B
X
Host B is unreachable!

ICMP

- ICMP (Internet Control Message Protocol) is an error-reporting protocol network devices like routers use to generate error messages to the source IP address when network problems prevent delivery of IP packets. ICMP creates and sends messages to the source IP address indicating that a gateway to the Internet that a router, service or host cannot be reached for packet delivery. Any IP network device has the capability to send, receive or process ICMP messages.

- ICMP is not a transport protocol that sends data between systems.

- While ICMP is not used regularly in end-user applications, it is used by network administrators to troubleshoot Internet connections in diagnostic utilities including ping and traceroute.

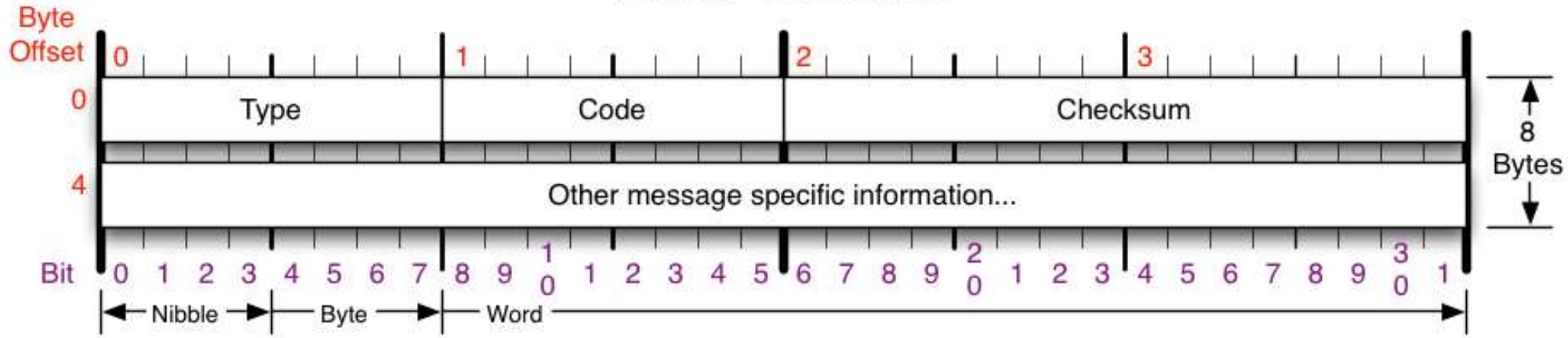
ICMP: Message Types

Type	Message
0	Echo reply
3	Destination unreachable
4	Source quench
5	Redirect
8	Echo request
11	Time exceeded
12	Parameter unintelligible
13	Time-stamp request
14	Time-stamp reply
15	Information request
16	Information reply
17	Address mask request
18	Address mask reply

IP Datagram

	Bits 0–7	Bits 8–15	Bits 16–23	Bits 24–31
IP Header (20 bytes)	Version/IHL	Type of service	Length	
	Identification		*flags* and *offset*	
	Time To Live (TTL)	Protocol	Checksum	
	Source IP address			
	Destination IP address			
ICMP Header (8 bytes)	Type of message	Code	Checksum	
	Header Data			
ICMP Payload (*optional*)	Payload Data			

ICMP Header



ICMP Message Types

Type	Code/Name
0	Echo Reply
3	Destination Unreachable
	0 Net Unreachable
	1 Host Unreachable
	2 Protocol Unreachable
	3 Port Unreachable
	4 Fragmentation required, and DF set
	5 Source Route Failed
	6 Destination Network Unknown
	7 Destination Host Unknown
	8 Source Host Isolated
	9 Network Administratively Prohibited
	10 Host Administratively Prohibited
	11 Network Unreachable for TOS

Type	Code/Name
3	Destination Unreachable (continued)
	12 Host Unreachable for TOS
	13 Communication Administratively Prohibited
4	Source Quench
5	Redirect
	0 Redirect Datagram for the Network
	1 Redirect Datagram for the Host
	2 Redirect Datagram for the TOS & Network
	3 Redirect Datagram for the TOS & Host
8	Echo
9	Router Advertisement
10	Router Selection

Type	Code/Name
11	Time Exceded
	0 TTL Exceeded
	1 Fragment Reassembly Time Exceeded
12	Parameter Problem
	0 Pointer Problem
	1 Missing a Required Operand
	2 Bad Length
13	Timestamp
14	Timestamp Reply
15	Information Request
16	Information Reply
17	Address Mask Request
18	Address Mask Reply
30	Traceroute

Checksum

Checksum of ICMP header

RFC 792

Please refer to RFC 792 for the Internet Control Message protocol (ICMP) specification.

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104. _____ refers to those attributes of a system visible to a programmer or, put another way, those attributes that have a direct impact on the logical execution of a program.

(1) Computer organization
(2) Computer architecture
(3) Microprocessor
(4) Bus

104. _____ प्रोग्रामर को दिखने वाले पद्धति के उन लक्षणों को या अन्य तरीके से कहें तो उन लक्षणों को जो प्रोग्राम के तार्किक क्रियान्वयन पर सीधे प्रभाव डालते हैं, की ओर इंगित करता है ।

(1) कम्प्यूटर संगठन
(2) कम्प्यूटर आर्किटेक्चर
(3) माइक्रोप्रोसेसर
(4) बस (Bus)

In general terms, is the distinction between computer organization and computer architecture?

Answer : Computer organization is how devices is implemented. Computer architecture is those attributes visible to the programmer.

Computer architecture refers to those attributes of a system visible to a programmer or, put another way, those attributes that have a direct impact on the logical execution of a program. Computer organization refers to the operational units and their interconnections that realize the architectural specifications.

105. How many characters does an escape sequence (\On,\Hn,\n,\f) in C++ consume ?

(1) 1
(2) 3
(3) 2
(4) None of these

105. C++ में कोई पलायन अनुक्रम (\On,\Hn,\n,\f) कितने वर्णों की खपत करता है ?

(1) 1
(2) 3
(3) 2
(4) इनमें से कोई नहीं

```
#include <iostream>
using namespace std;

int main(void) {
        printf("%d",sizeof('\f'));
        return 0;
}
```

```
#include <iostream>
using namespace std;

int main(void) {
        printf("%d",sizeof("\f"));
return 0;
}
```

106. The closeness of the recorded version to the original sound is called
(1) Fidelity.
(2) Digitization.
(3) Sampling.
(4) Nyquist Theorem.

106. किसी मूल ध्वनि की उसके ध्वन्यांकित (रेकोर्डेड) रूपांतर से समीपता कहलाती है
(1) तद्रूपता
(2) डिजिटाईजेशन
(3) प्रतिदर्शी
(4) नाइक्विस्ट प्रमेय

- **What is Sound?**
  Sound is the brain's interpretation of electrical impulses being sent by the inner ear through the nervous system.

- Audio is sound within the acoustic range available to humans.

- An audio frequency (AF) is an alternating signal within the 20 to 20,000 hertz (cycles per second) range.

- Sound waves are disturbances in the air (or other mediums of transmission). The sound waves consist of compressions and rarefactions.
- The **amplitude** measures the relative loudness of the sound, which is the distance between a valley and a crest.
- The **amplitude** determines the volume of the sound.
- The unit of measurement of volume is a **decibel**.

- **Frequency** : The difference in time between the formation of two crests is termed frequency.
- The number of peaks that occur in one second is the frequency.
- Another term associated with frequency is **pitch**. If an object oscillates rapidly, it creates a "**high-pitched**" sound (treble).
- A low-frequency sound on the other hand is produced by an object that vibrates slowly, such as the thicker strings of a piano or guitar (bass).

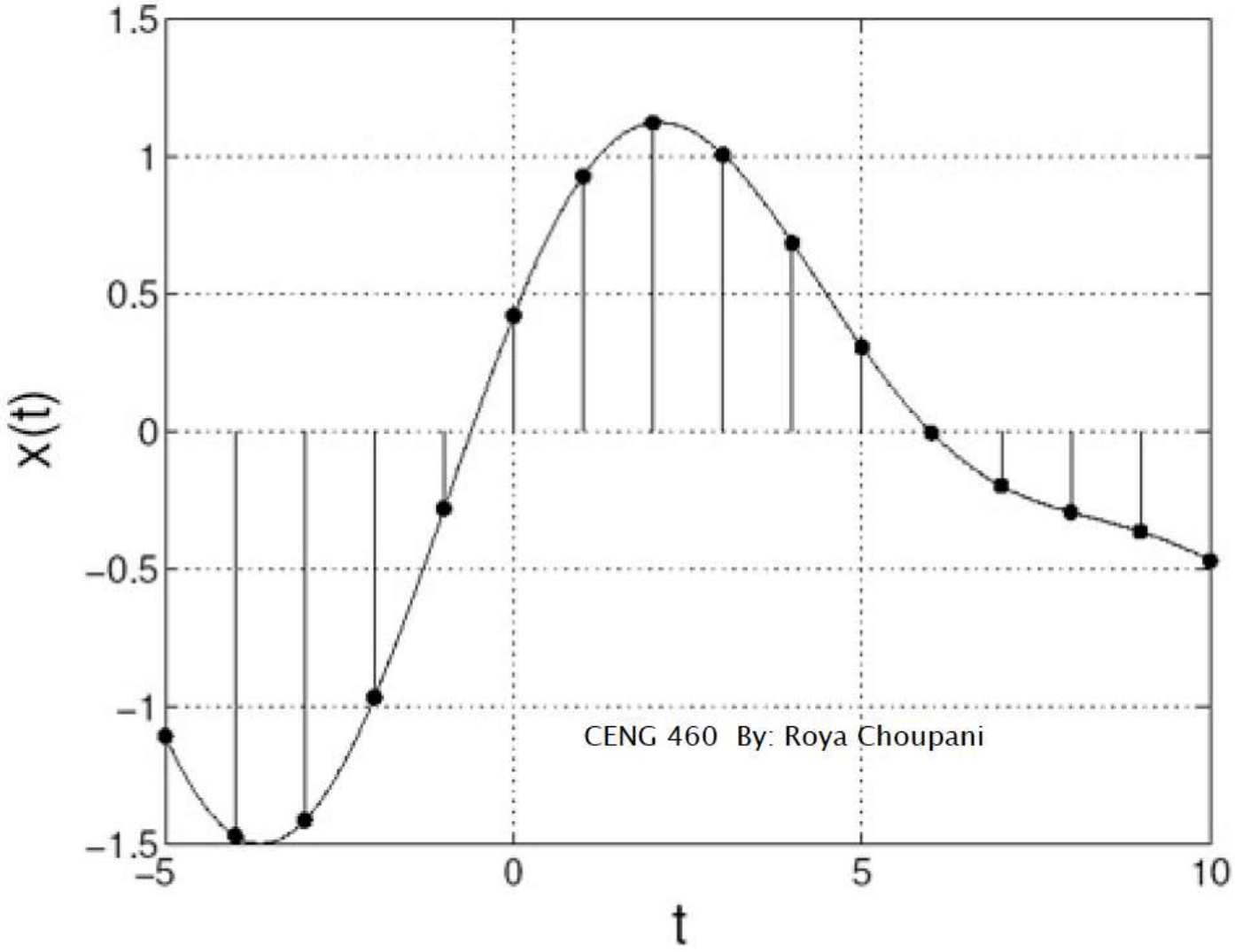
- **Wavelength:** Wavelength is the distance from the midpoint of one crest to the midpoint of the next crest.
- Wavelength is represented by the symbol λ

- **Bandwidth:** Bandwidth is defined as the difference between the highest and the lowest frequency contained in a signal.
- A signal which spans the range of 200-3200 Hz has a bandwidth (BW) of:

$$BW = 3200 - 200 = 3000 \text{ Hz}$$

Sampling

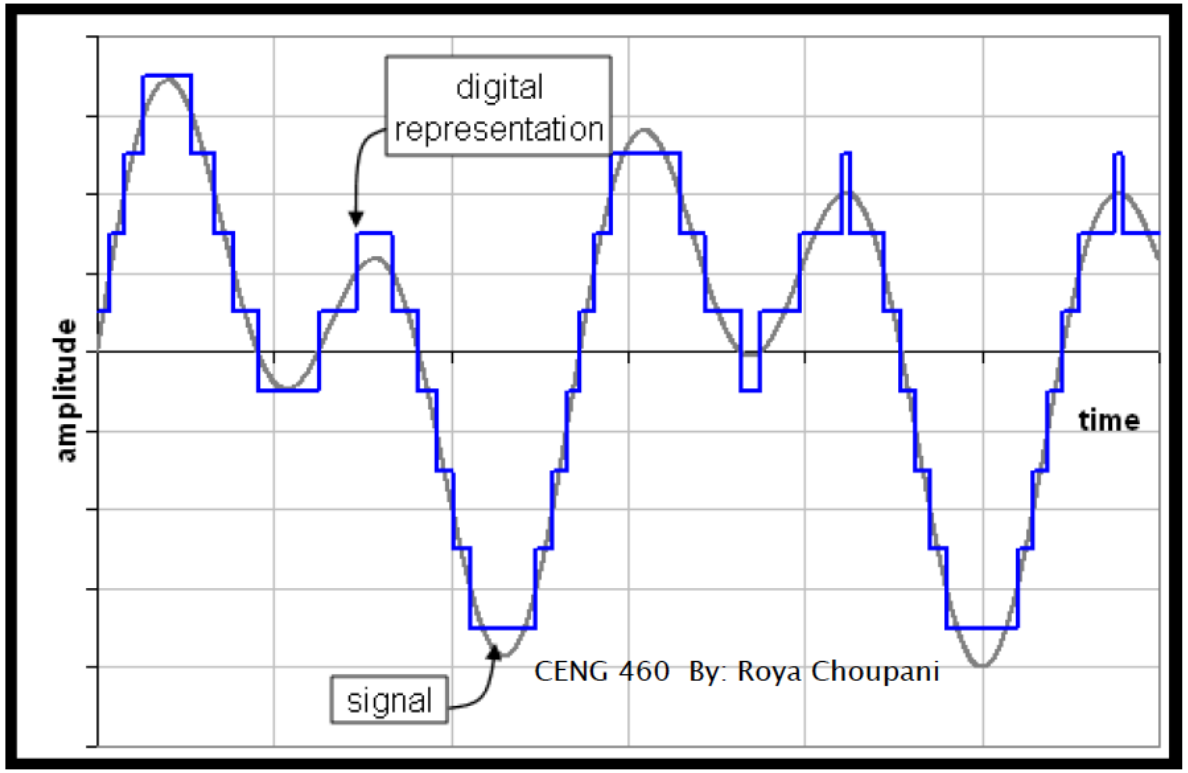
- Audio signal is an analog signal
- Computers store digital signal
- To convert analog signal into digital signal we have to do sampling


1.5
1
0.5
0
−0.5
−1
−1.5
x(t)
−5
0
5
10
t
CENG 460 By: Roya Choupani

Quantization

- Sample values can be in a large range and include real numbers.
- To store sample values with less number of bits quantization is used.
- In quantization the values in a range are mapped to a single number

Quantization



Sample Audio Data

- 20,000 Hz sound, sampled at 40,000 sample/second
- Quantization level: 256 (8 bits)
- 40,000 * 1 bytes /sec data

- With 65,536 (16 bits) quantization levels, data size will be 40,000 * 2 = 80,000 bytes/second

Fidelity

- Fidelity is defined as the closeness of the recorded version to the original sound. In the case of digital speech, it depends upon the number of bits per sample and the sampling rate.
- A really high-fidelity (hi-fi) recording takes up a lot of memory space (176.4 Kb for every second of audio of stereo quality sampled at 16 bits, 44.1 kHz per channel).
- Fortunately for most computer multimedia applications, it is not necessary to have very high fidelity sound.

Sound Formats and Settings

- Mono Recording:
  File size = Sampling rate x duration of recording in seconds x (bits per sample/8) x 1

- Stereo Recording:
  File size = Sampling rate x duration of recording in seconds x (bits per sample/8) x 2

Nyquist Theorem

The Nyquist Theorem, also known as the sampling theorem, is a principle in the digitization of analog signals. For analog-to-digital conversion (ADC) to result in a faithful reproduction of the signal, slices, called samples, of the analog waveform must be taken frequently. The number of samples per second is called the sampling rate or sampling frequency.

107. Which layers of the OSI model are host-to-host layers ?

(1) Transport, Session, Presentation, Application.

(2) Network, Transport, Session , Presentation.

(3) Datalink, Network, Transport, Session.

(4) Physical, Datalink, Network, Transport.

107. OSI मॉडल की कौन सी परत मेजबान-मेजबान परत हैं ?

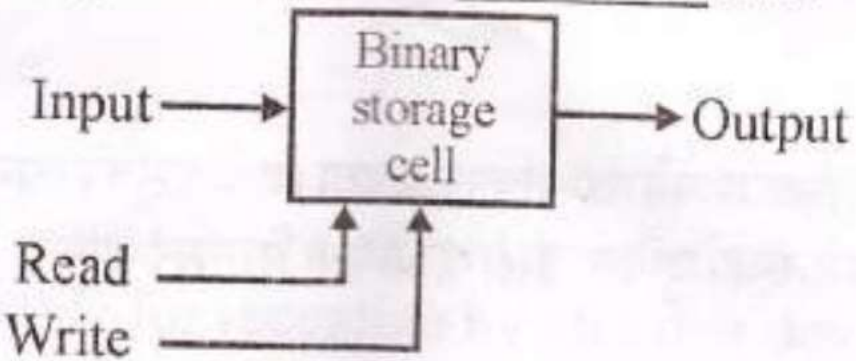
(1) परिवहन, सत्र, प्रस्तुति, प्रयुक्ति

(2) नेटवर्क, परिवहन, सत्र, प्रस्तुति

(3) डेटालिंक, नेटवर्क, परिवहन, सत्र

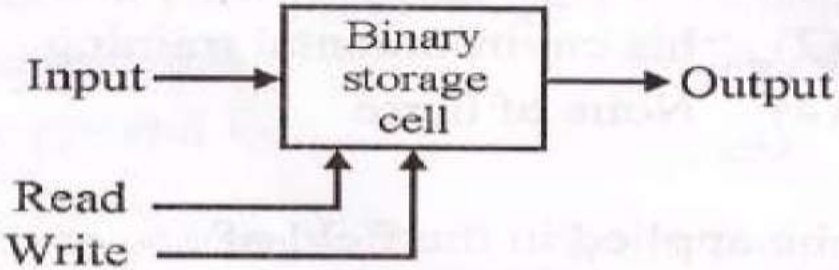
(4) भौतिक, डेटालिंक, नेटवर्क, परिवहन

108. The following diagram depicts a _____ cell.



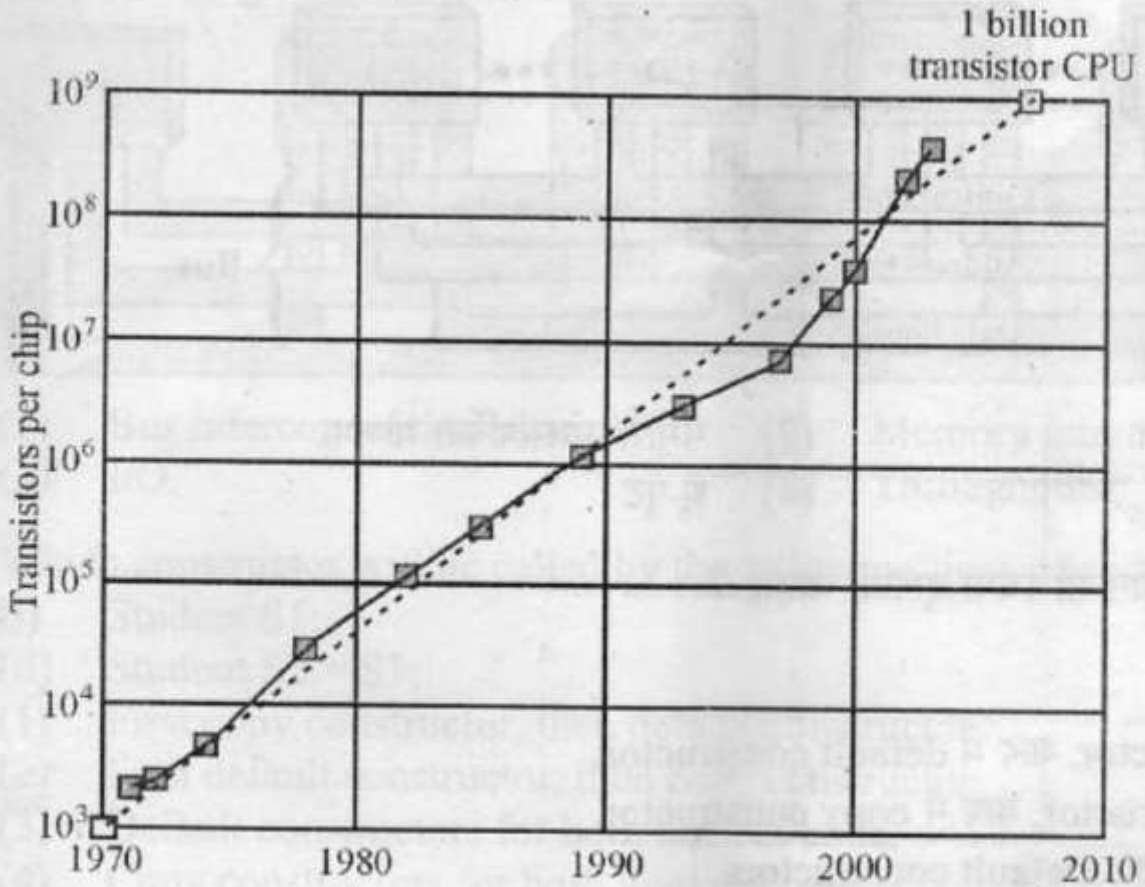
(1) storage
(2) mobile
(3) memory
(4) register

108. निम्न आकृति एक _____ सेल को दर्शाती है ।



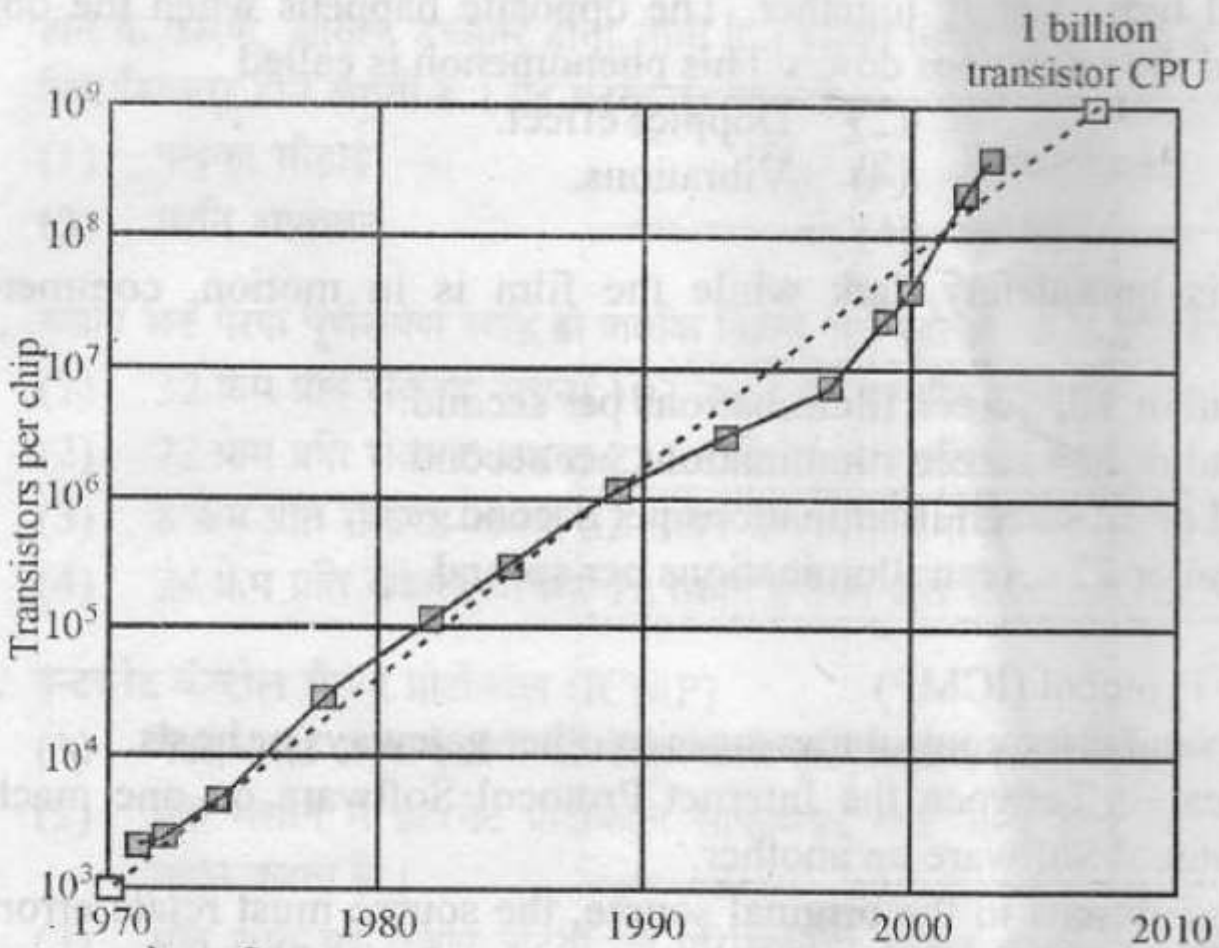
(1) संचायक
(2) मोबाईल
(3) मेमोरी
(4) रजिस्टर

109. The diagram below represents



(1) Moore' law.
(2) Newton Raphson method.
(3) Boyle's law.
(4) Gregor law.

109. निम्न आकृति प्रस्तुत करती है :



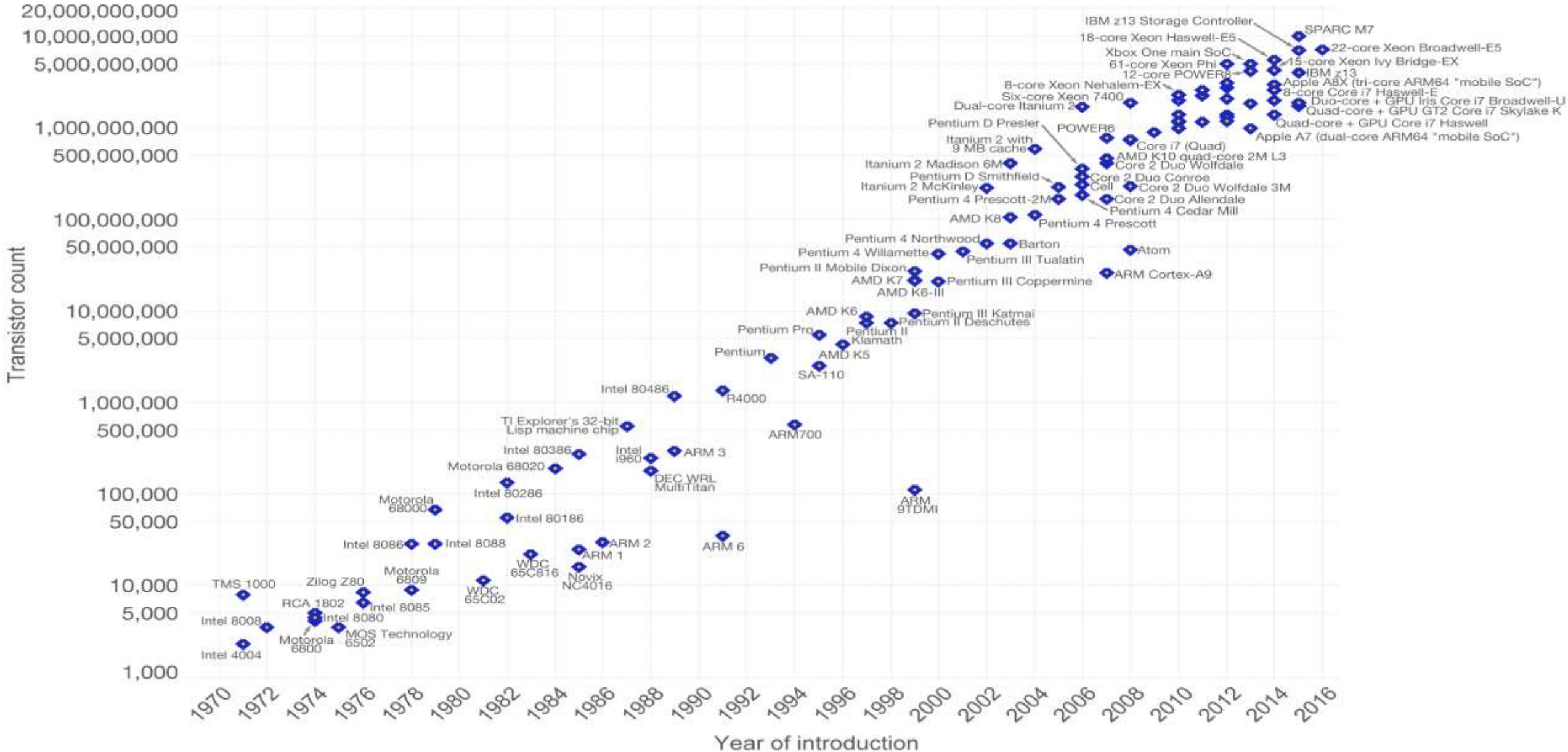
(1) मूरे का नियम
(2) न्यूटन रॉफसन विधि
(3) बॉयल का नियम
(4) ग्रेगोर नियम

- Moore's law is the observation that the number of transistors in a dense integrated circuit doubles about every two years

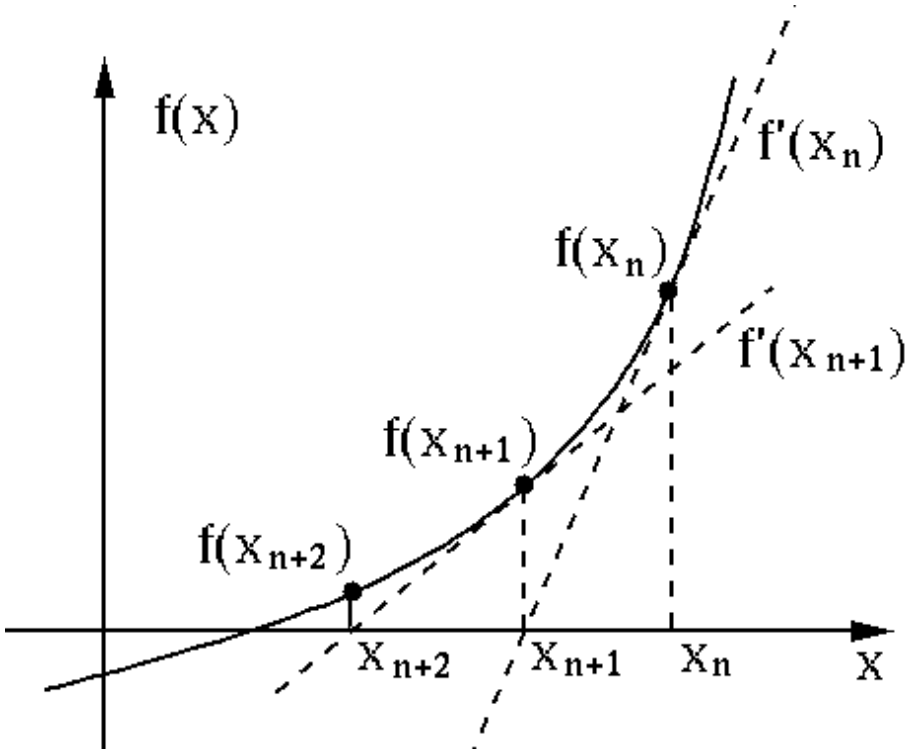
Moore's Law – The number of transistors on integrated circuit chips (1971-2016)

Our World in Data

Moore's law describes the empirical regularity that the number of transistors on integrated circuits doubles approximately every two years. This advancement is important as other aspects of technological progress – such as processing speed or the price of electronic products – are strongly linked to Moore's law.

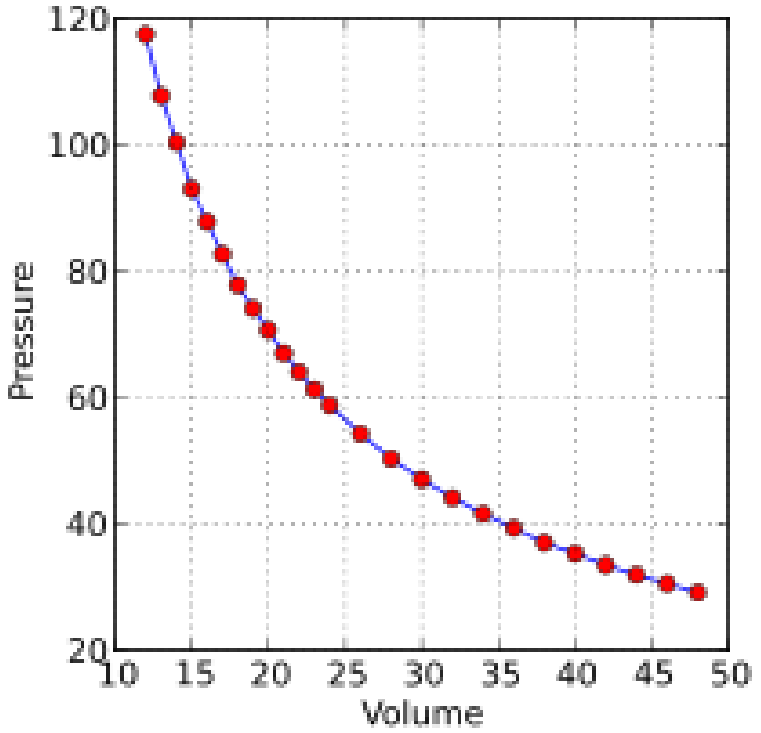


In numerical analysis, Newton's method (also known as the Newton–Raphson method), named after Isaac Newton and Joseph Raphson, is a method for finding successively better approximations to the roots (or zeroes) of a real-valued function

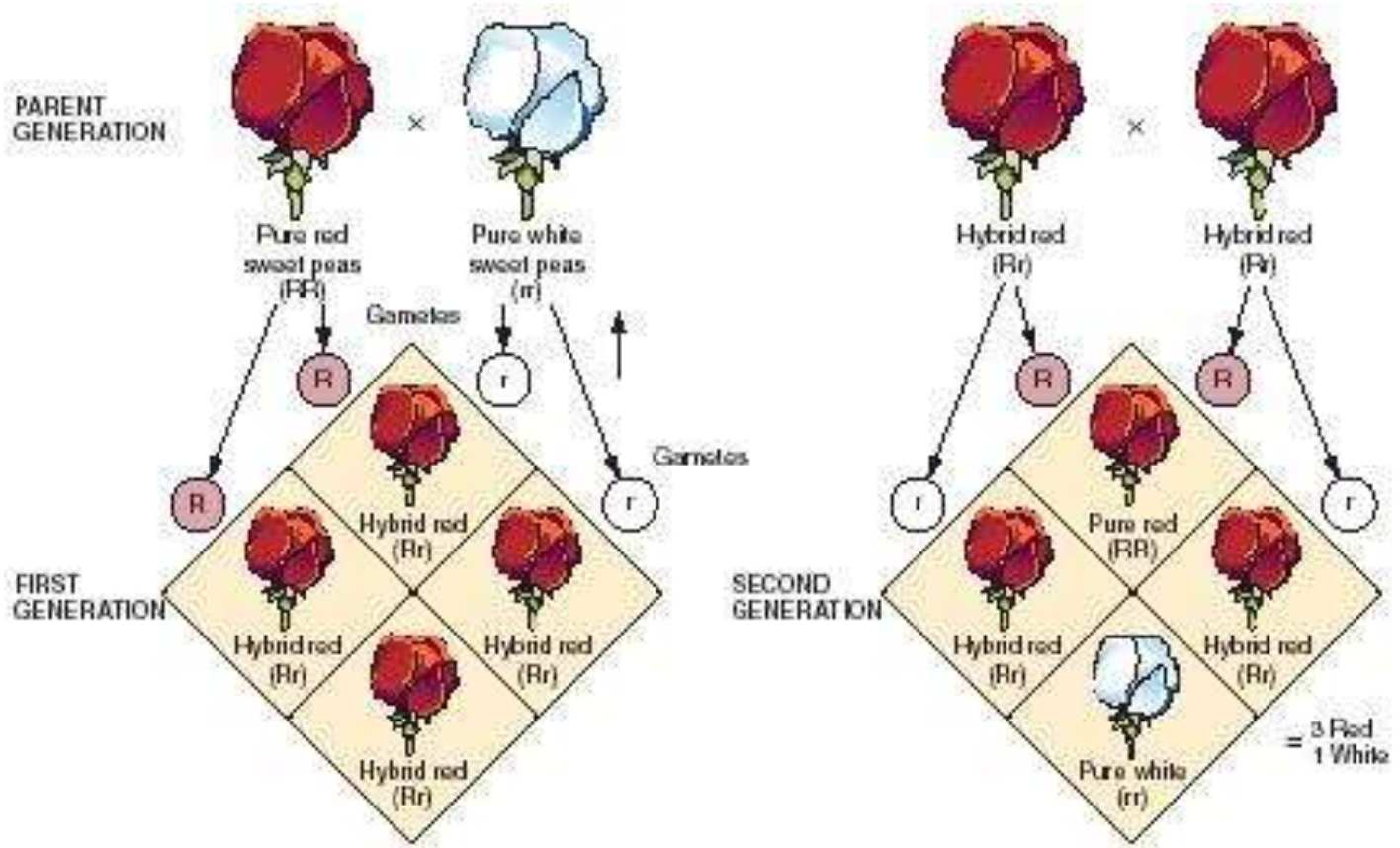


Boyle's Law

a law stating that the pressure of a given mass of an ideal gas is inversely proportional to its volume at a constant temperature.



Gregor mendel law of inheritance



Mendel's First Law: The Law of Segregation

110. _____ is the first Intel x86 microprocessor with a dual core, referring to the implementation of two processors on a single chip.

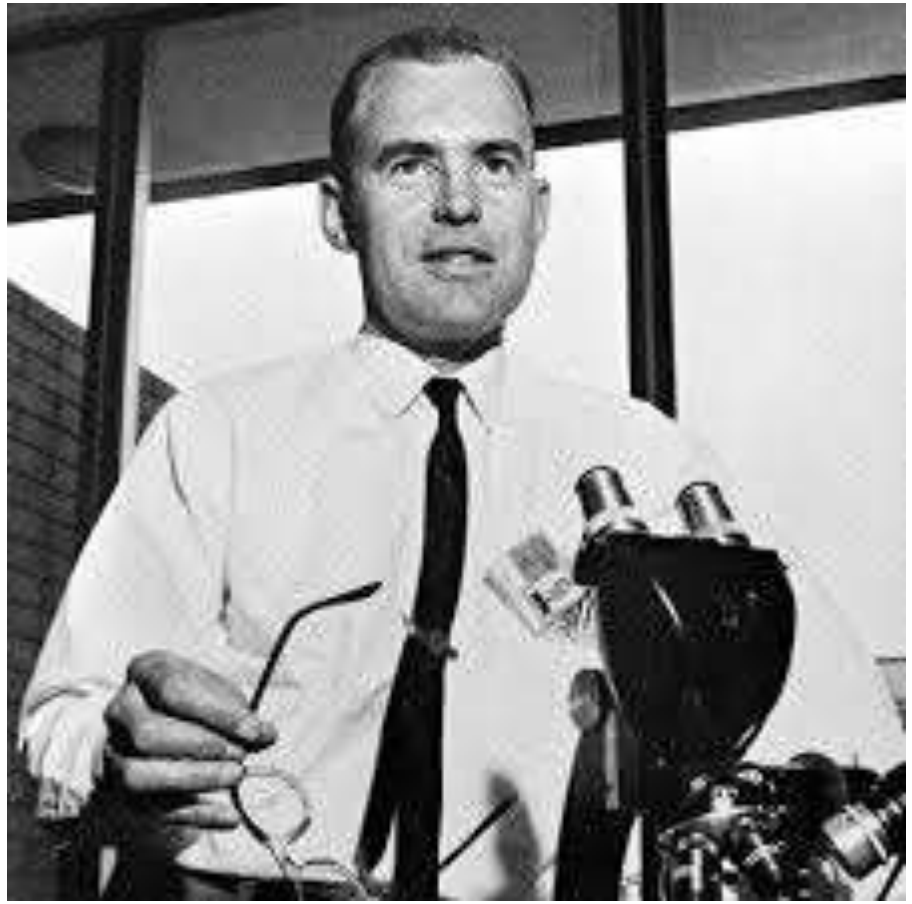
(1) Core
(2) Core 2 duo
(3) Dual core
(4) Centrino

110. _____ पहला इन्टेल x86 माइक्रोप्रोसेसर है, जिसमें दोहरा कोर होता है, जो यह इंगित करता है कि एकल चिप में ही दो प्रोसेसर प्रयुक्त हैं ।

(1) कोर
(2) कोर - 2 ड्युओ
(3) ड्युअल कोर
(4) सेन्ट्रिनो

Timeline: A brief history of the x86 microprocessor

- **1947:** The transistor is invented at Bell Labs



1965: Gordon Moore at Fairchild Semiconductor observes in an article for Electronics magazine that the number of transistors on a semiconductor chip doubles every year (download PDF). For microprocessors, it will double about every two years for more than three decades.

1968: Moore, Robert Noyce and Andy Grove found Intel Corp. to pursue the business of "INTegrated ELectronics."

2 of founders leave Fairchild, form own electronics firm

Business News

Ampex founder Alexander Poniatoff named winner of electronics

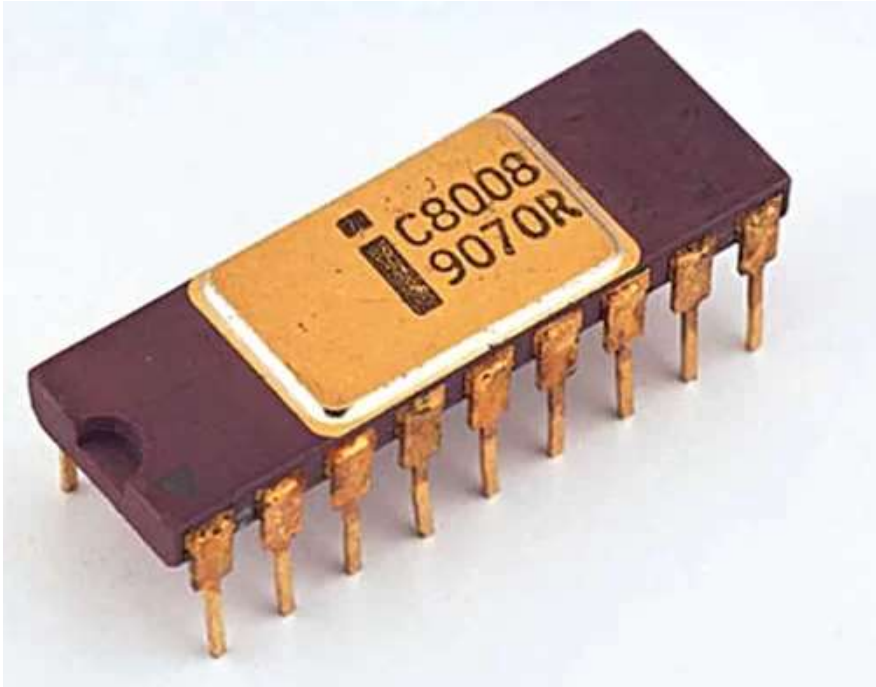
Stock market stays lower as trade volume slackens


Intel Corporation Founders

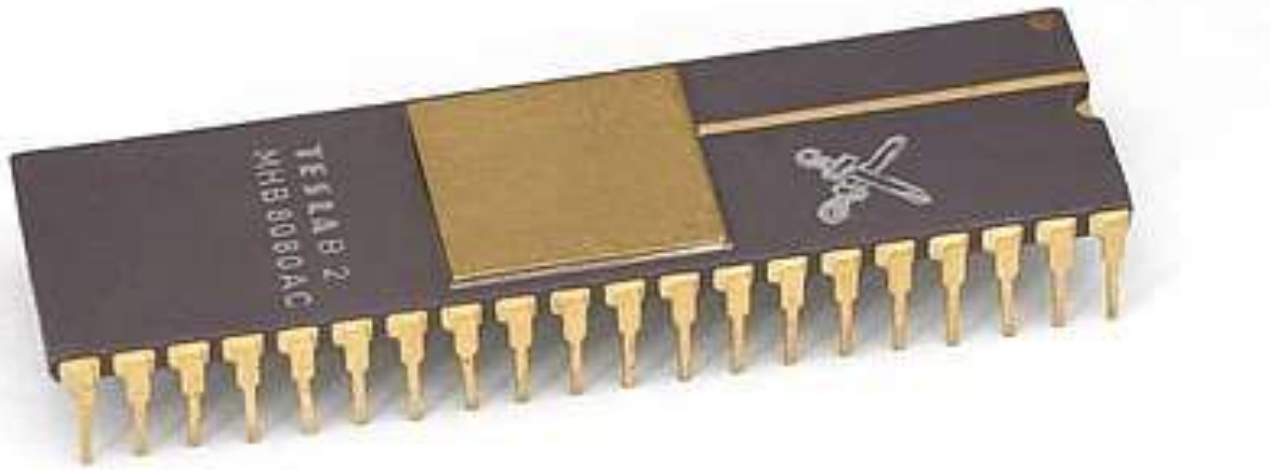
- 1969: Intel announces its first product, the world's first metal oxide semiconductor (MOS) static RAM, the 1101. It signals the end of magnetic core memory

- 1971: Intel launches the world's first microprocessor, the 4-bit 4004, designed by Federico Faggin.
- The 2,000-transistor chip is made for a Japanese calculator, but a farsighted Intel ad calls it "a microprogrammable computer on a chip."

- **1972:** Intel announces the 8-bit 8008 processor. Teenagers Bill Gates and Paul Allen try to develop a programming language for the chip, but it is not powerful enough.



- **1974:** Intel introduces the 8-bit 8080 processor, with 4,500 transistors and 10 times the performance of its predecessor.

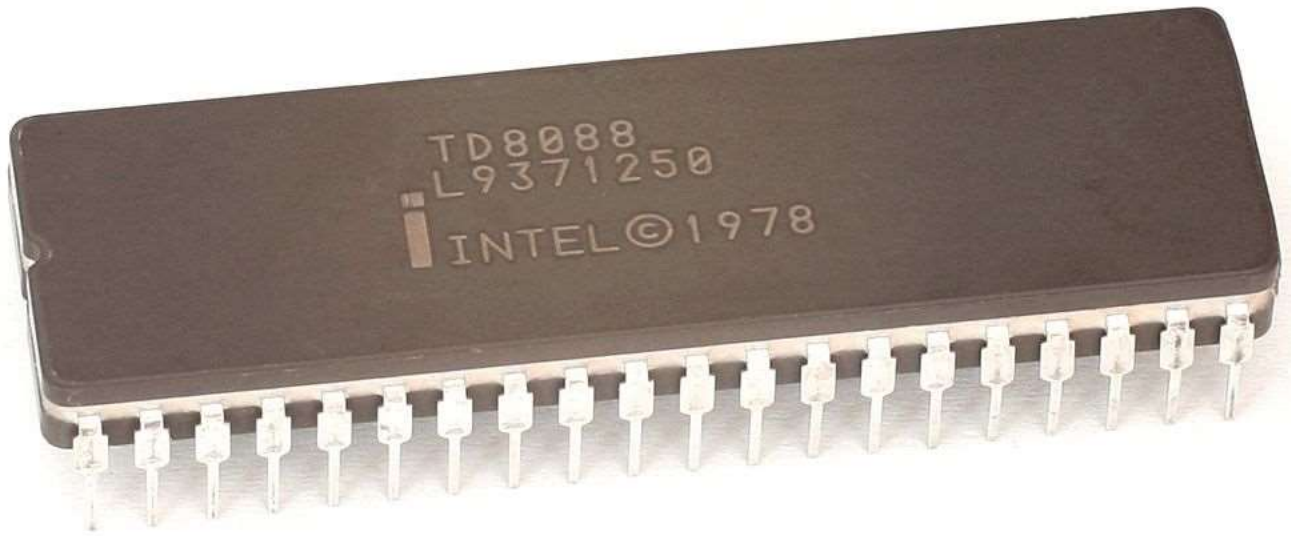


- **1975:** The 8080 chip finds its first PC application in the Altair 8800, launching the PC revolution. Gates and Allen succeed in developing the Altair Basic language, which will later become Microsoft Basic, for the 8080.

- **1976:** The x86 architecture suffers a setback when Steve Jobs and Steve Wozniak introduce the Apple II computer using the 8-bit 6502 processor from MOS Technology. PC maker Commodore also uses the Intel competitor's chip

- **1978: Intel introduces the 16-bit 8086 microprocessor. It will become an industry standard.**

- **1979:** Intel introduces a lower-cost version of the 8086, the 8088, with an 8-bit bus



- **1980:** Intel introduces the 8087 math co-processor.

- **1981:** IBM picks the Intel 8088 to power its PC. An Intel executive would later call it "the biggest win ever for Intel."

- **1982:** IBM signs Advanced Micro Devices as second source to Intel for 8086 and 8088 microprocessors

- **1982:** Intel introduces the 16-bit 80286 processor with 134,000 transistors

- **1984:** IBM develops its second-generation PC, the 80286-based PC-AT. The PC-AT running MS-DOS will become the de facto PC standard for almost 10 years.

- **1985:** Intel exits the dynamic RAM business to focus on microprocessors, and it brings out the 80386 processor, a 32-bit chip with 275,000 transistors and the ability to run multiple programs at once.

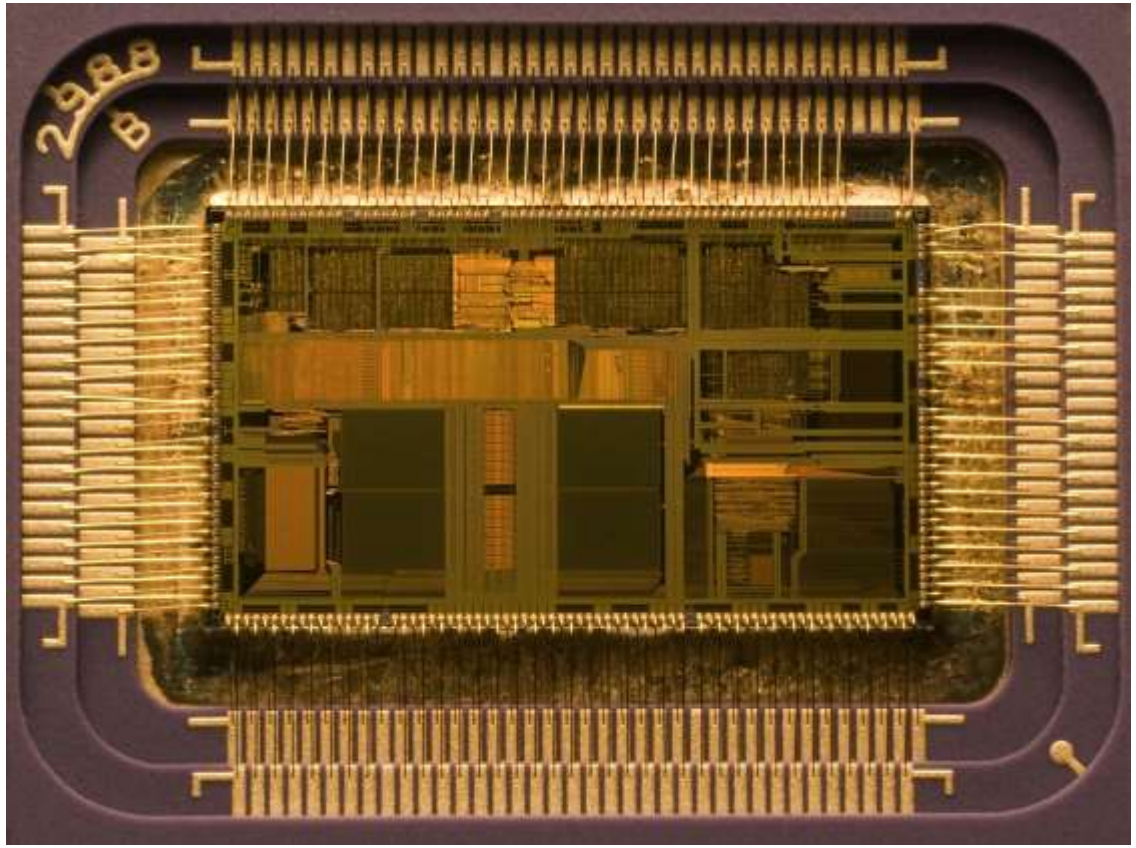
- **1986:** Compaq Computer leapfrogs IBM with the introduction of an 80386-based PC.

- **1987:** VIA Technologies is founded in Fremont, Calif., to sell x86 core logic chip sets.

- **1989:** The 80486 is launched, with 1.2 million transistors and a built-in math co-processor. Intel predicts the development of multicore processor chips some time after 2000

- **Late 1980s:** The complex instruction set computing (CISC) architecture of the x86 comes under fire from the rival reduced instruction set computing (RISC) architectures of the Sun Sparc, the IBM/Apple/Motorola PowerPC and the MIPS processors. Intel responds with its own RISC processor, the i860.

- **1990:** Compaq introduces the industry's first PC servers, running the 80486.



- **1993:** The 3.1 million transistor, 66-MHz Pentium processor with superscalar technology is introduced.
- **1994:** AMD and Compaq form an alliance to power Compaq computers with Am486 microprocessors

- **1995:** The Pentium Pro, a RISC slayer, debuts with radical new features that allow instructions to be anticipated and executed out of order. That, plus an extremely fast on-chip cache and dual independent buses, enable big performance gains in some applications.

- **1997:** Intel launches its 64-bit Epic processor technology. It also introduces the MMX Pentium for digital signal processor applications, including graphics, audio and voice processing

- **EPIC** (Explicitly Parallel Instruction Computing) is a **64-bit microprocessor**instruction set, jointly defined and designed by Hewlett Packard and Intel, that provides up to 128 general and floating point unit registers and uses speculative loading, predication, and explicit parallelism to accomplish its computing tasks

- **1998:** Intel introduces the low-end Celeron processor.

- **1999:** VIA acquires Cyrix Corp. and Centaur Technology, makers of x86 processors and x87 co-processors.

Cyrix

CenTaur technology

- **2000:** The Pentium 4 debuts with 42 million transistors

- **2003:** AMD introduces the x86-64, a 64-bit superset of the x86 instruction set.

- **2004:** AMD demonstrates an x86 dual-core processor chip

- **2005:** Intel ships its first dual-core processor chip

- **2005:** Apple announces it will transition its Macintosh computers from PowerPCs made by Freescale (formerly Motorola) and IBM to Intel's x86 family of processors

- **2005:** AMD files antitrust litigation charging that Intel abuses "monopoly" to exclude and limit competition. (The case is still pending in 2008.)

- **2006:** Dell Inc. announces it will offer AMD processor-based systems.