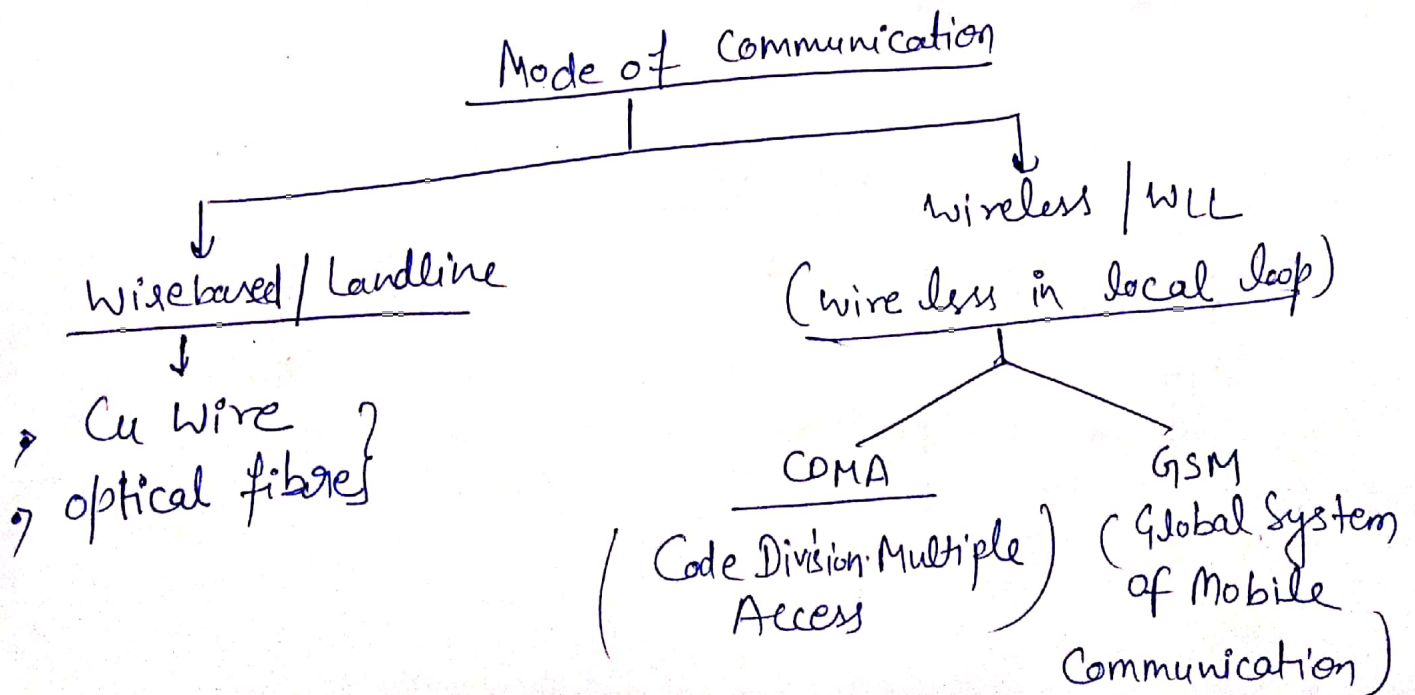
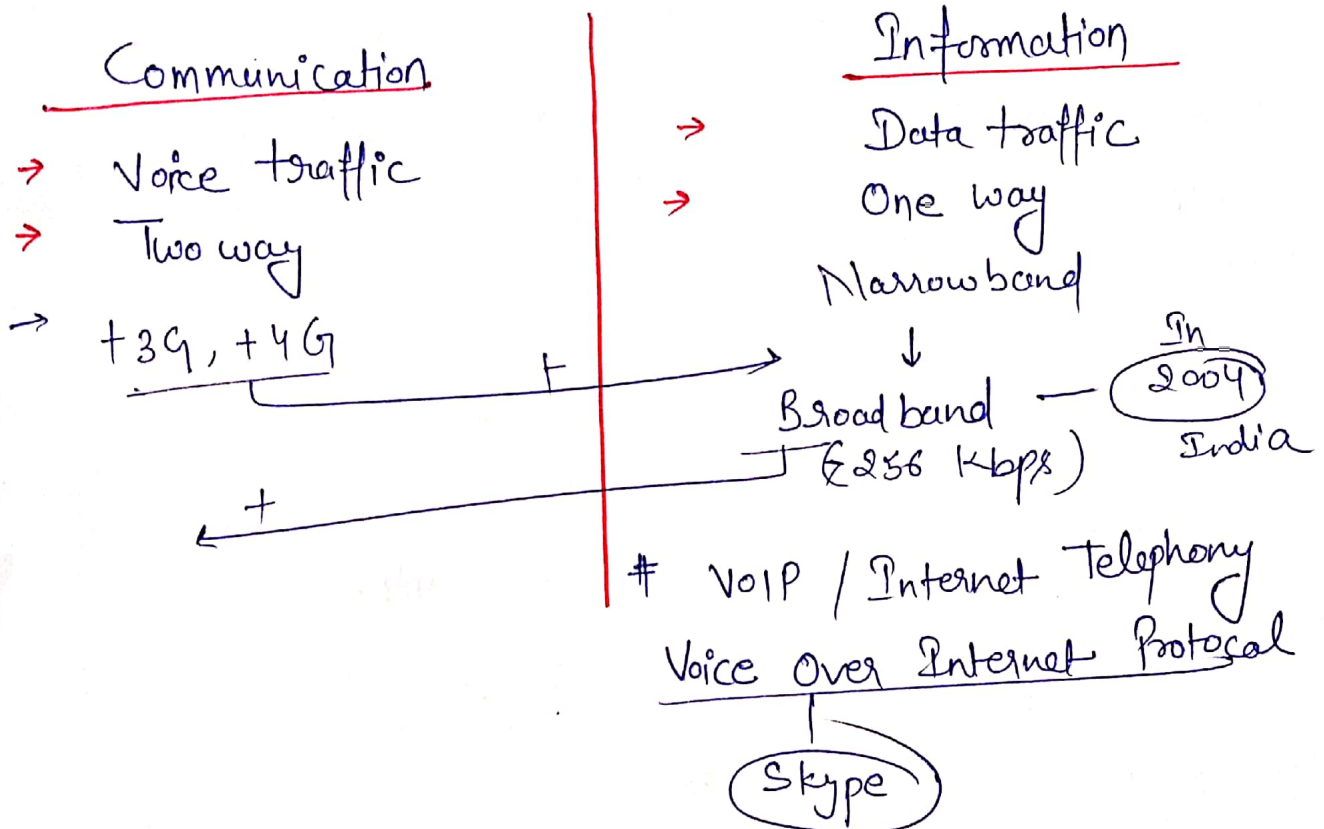


Science & Tech Class-9

Topic- Basic Connect of ICT, Wire and Wireless Communication

ICT (Information Communication Technology)



[2]

Cu Wire

- Cu, Rusting Problem
- Limited Connection
- Congestion / Cross Connection
- Voice Quality not good
- Repeaters used at small distance
- Not having high heat Resistance.
- Defence - never prefer
- Bandwidth - very low
- Narrowband

Optical fibre

- made up of Si, SiO₂
- No Rusting
- Single optical fibre > 1000 Connections.
- Multiplexing → no congestion
No cross connection
- voice quality increased
- min at a distance of 80 km Repeater are used
- Heat Resistance up to 400°C - 520°C
- Defence Prefer
- Bandwidth - Higher

* DSL - Digital Subscriber Line
ADSL - Asymmetrical Digital Subscriber line

Broadband.

- DSL
- ADSL
- Cable Modem

Wireless

CDMA
(Code Division Multiple Access)

GSM

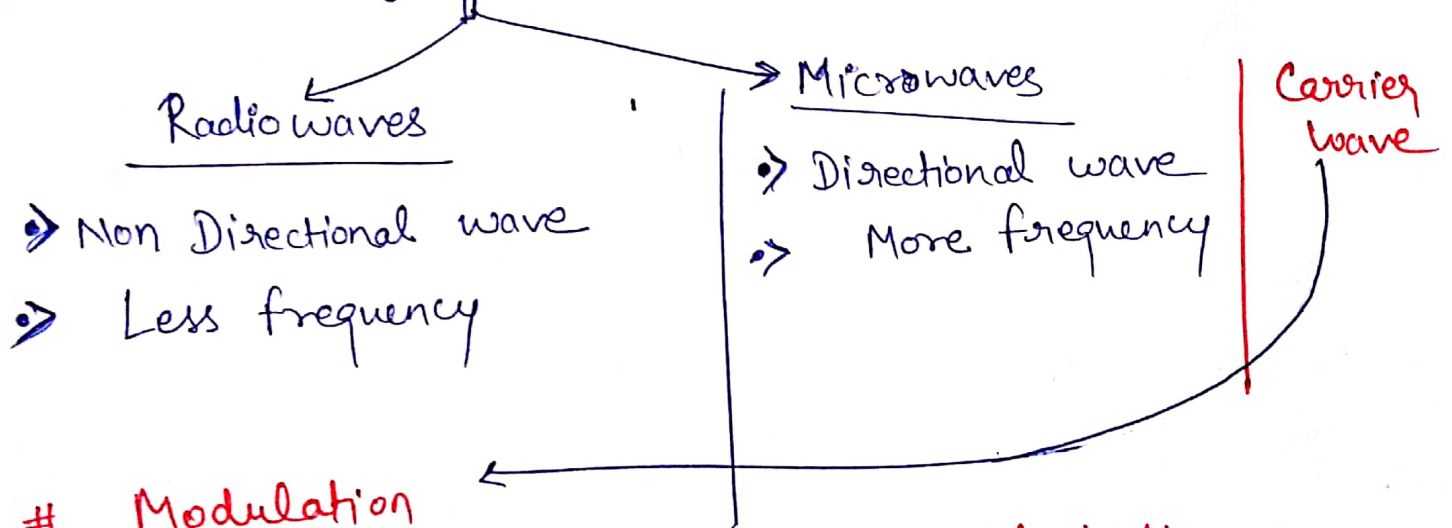
Wireless

- ① FDMA (Freq.) — 1st Generation (1G) — (Analog)
- ② TDMA (Time.)
- ③ CDMA (Code) } 2nd Generation (2G) — (Digital)

Wireless

Technology working through Electromagnetic Waves
 ↓
 (invisible waves)

Electromagnetic Wave



Modulation

- ① Phase Shift Modulation (PM) — Bluetooth
- ② Frequency Modulation (FM) — FM
- ③ Amplitude Modulation (AM) — AIR (Air India Radio).

Electromagnetic Wave

- frequency → Max^m tendency to do work in a certain period of time. \propto Energy
- Wave length → Distance travelled by waves
- Amplitude → thickness of waves

④

CDMA

(Code Division Multiple Access)

- Introduced earlier
- Later on (India)
- 10-15% people → USA + S. Korea
- Technology → Costly
- Reliance phone battery fastly discharge.
- More safe and secure
- Echo, calldrop, Cross connection
↳ (Rare Problem)
- Defence always prefer CDMA
- CDMA

GSM

(Global System of Mobile Communication)

- (GSM is variant of TDMA)
- Later on (World wide)
- first in (India) — 100%
- 85-90% people — European
- Technology → Cheaper.
- Not have discharging battery problem.
- Echo, calldrop, Cross Connection } — Common
- flexibility
- Enhance bandwidth / Quality (Improved Generation)

Problem with Chinese handset

IMEI No → (International Mobile equipment Identity Number)

SIM Card : Subscriber Identity Module Card.

↳ 1992 — Radiolinja Company at Munich in Germany.

↳ IMSI no. → International Mobile Subscriber Identity No.

Conventional Phone

- Connected from Tower to Tower
- Troposphere

Satellite Phone

- Signal goes to satellite then back to earth.
- Call delay + Call minutes are costly.
- No tower — still connect.

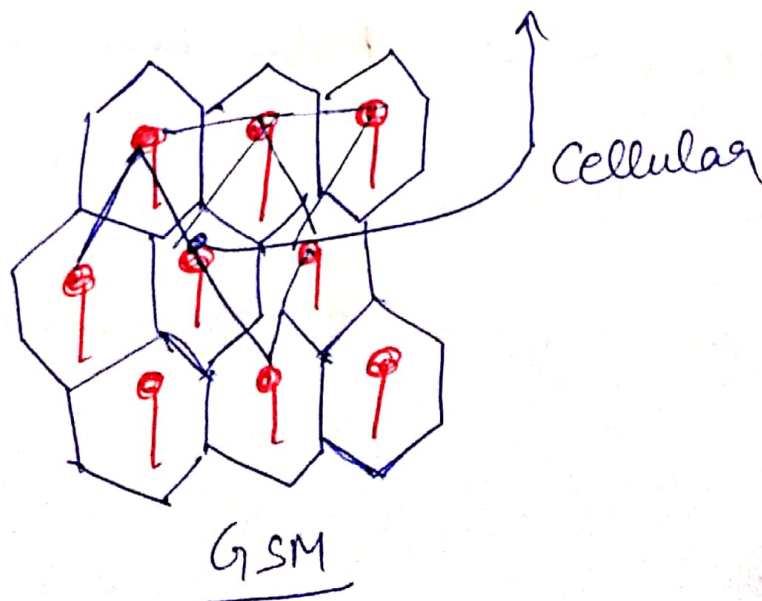
↓
 { Sahara Desert,
 Polar Region, Himalaya, }
 Ocean

Globalstar }
 Thuraya } → Satellite Phone
 Iridium }

Mobile Generation

Mobile Phone

Cell phone



⑧

0G - Zero Generation

0G \Rightarrow Radiophone / Taxiphone

↓
A device was mounted in a vehicle & its headset was close to driver seat

No tower introduced.

Not a cellphone Generation.

1G - first Generation

1G \rightarrow FDMA (Frequency Division Multiple Access)
 \rightarrow Based on Analog Signals
 \rightarrow Power Consumption was very fast

2G - Second Generation

2G \rightarrow TDMA \rightarrow GSM
CDMA

\rightarrow Performing on Digital Signal $\left\{ \begin{array}{l} \text{Performance } \uparrow \\ \text{Accuracy } \uparrow \end{array} \right.$
 \rightarrow Power Consumption low

2.5G - GPRS (General Packet Radio Services)

↓
WAP (Wireless Application Protocol)
 \rightarrow Browsing and Surfing
 \rightarrow MMS (Multimedia Messaging Services)