PANIMALAR INSTITUTE OF TECHNOLOGY

Department of Computer Science and Engineering

Academic Year: 2019- 2020 (Odd Semester) **Date: 09.07.2019**

Degree, Semester & Branch : V Semester B.E. CSE

Course Code & Title : CS8591 Computer Networks

Name of the Faculty member: Dr.S.Hemalatha, Mr.K.Gopinath & Mrs.M.Vidhya

Innovative practice: Learning through Mind map

Topic: Transmission media

Description: A mind map is a diagram used to visually organize information. A mind map is hierarchical and shows relationships among pieces of the whole. It is often created around a single concept, drawn as an image in the center of a blank page, to which associated representations of ideas such as images, words and parts of words are added. Major ideas are connected directly to the central concept, and other ideas branch out from those major ideas

Use of learning through argumentation

- Students will be able visually the concepts and organize information.
- Mind map helps students to relate the concepts.
- It can be used classify ideas, and as an aid to study organizing information.
- It also allows students to remember ideas and also major ideas are connected directly to the central concept, and other ideas branch out from those major ideas.

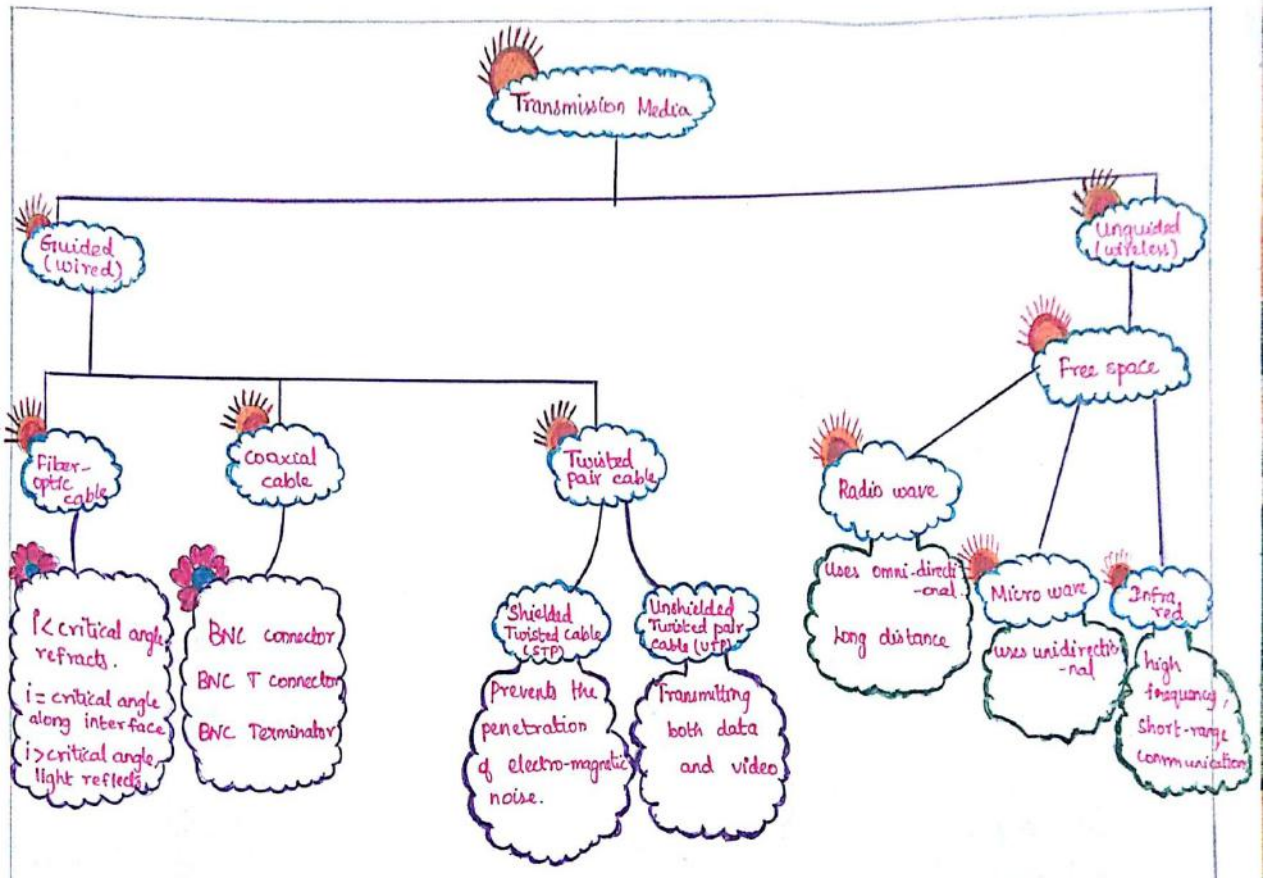
Procedure to use Learning through Argumentation

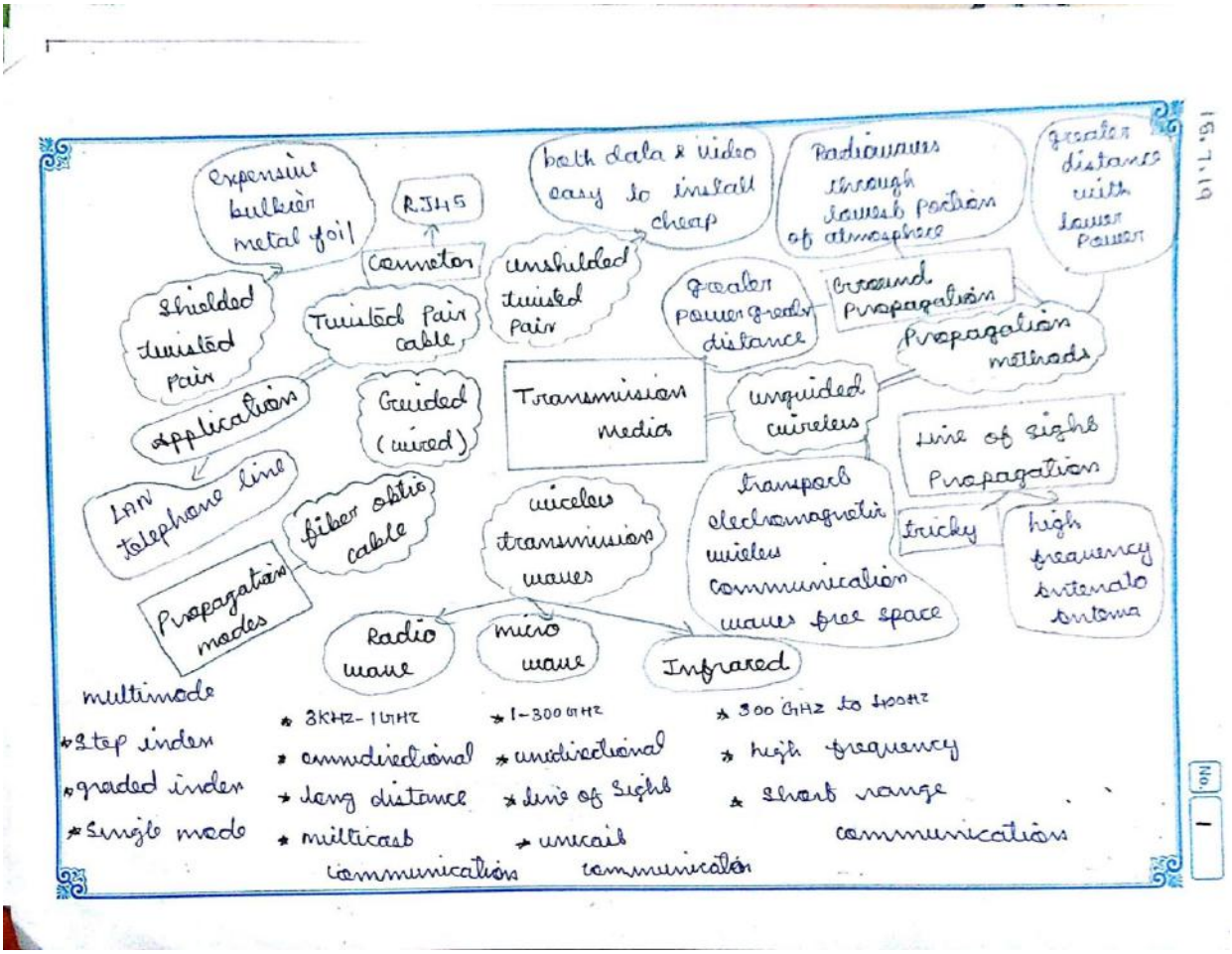
- Teachers will give longer explanations in the notes section of the topic
- Also Indicate relationships between ideas with the connection tool
- Use different icons, shapes,colors and font sizes to emphasize, highlight and group ideas

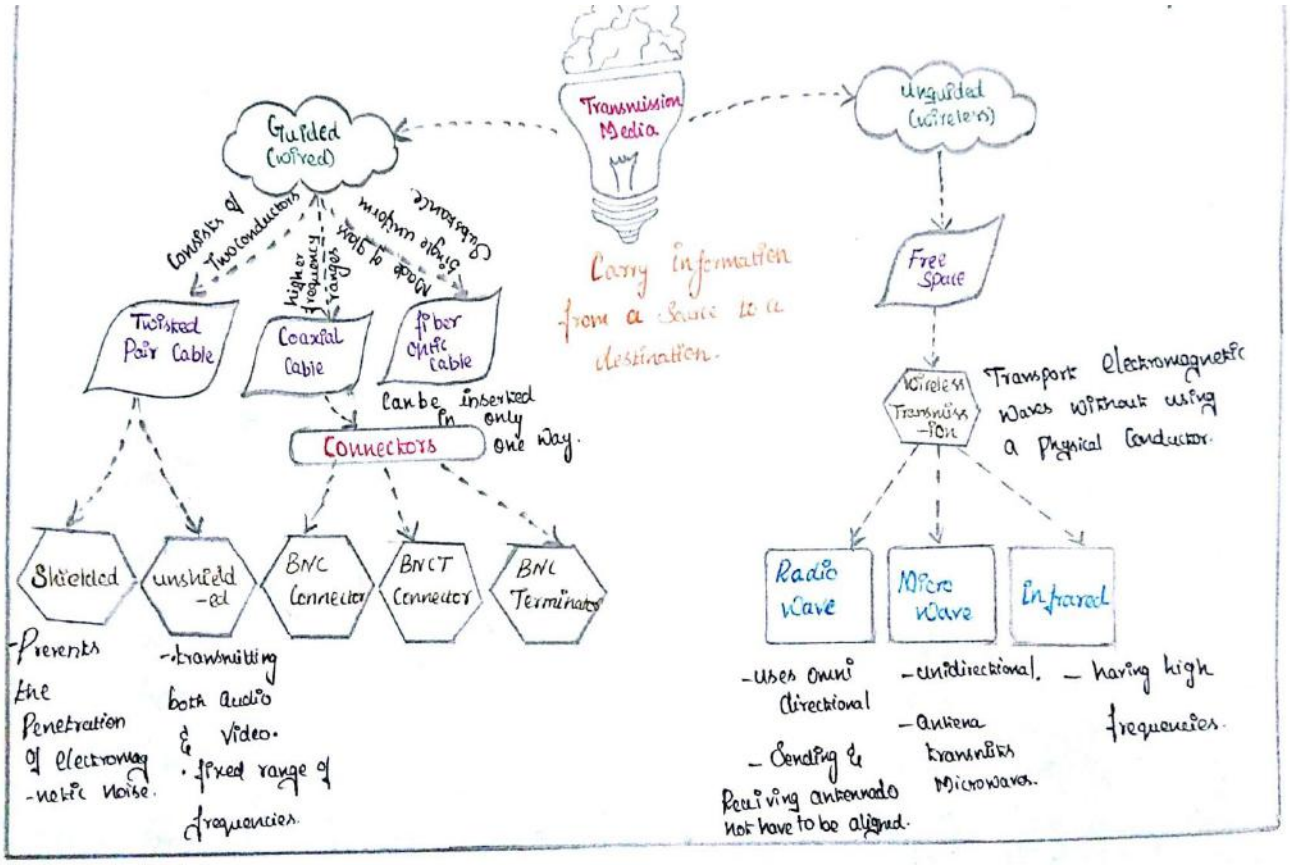
Outcome of this session:

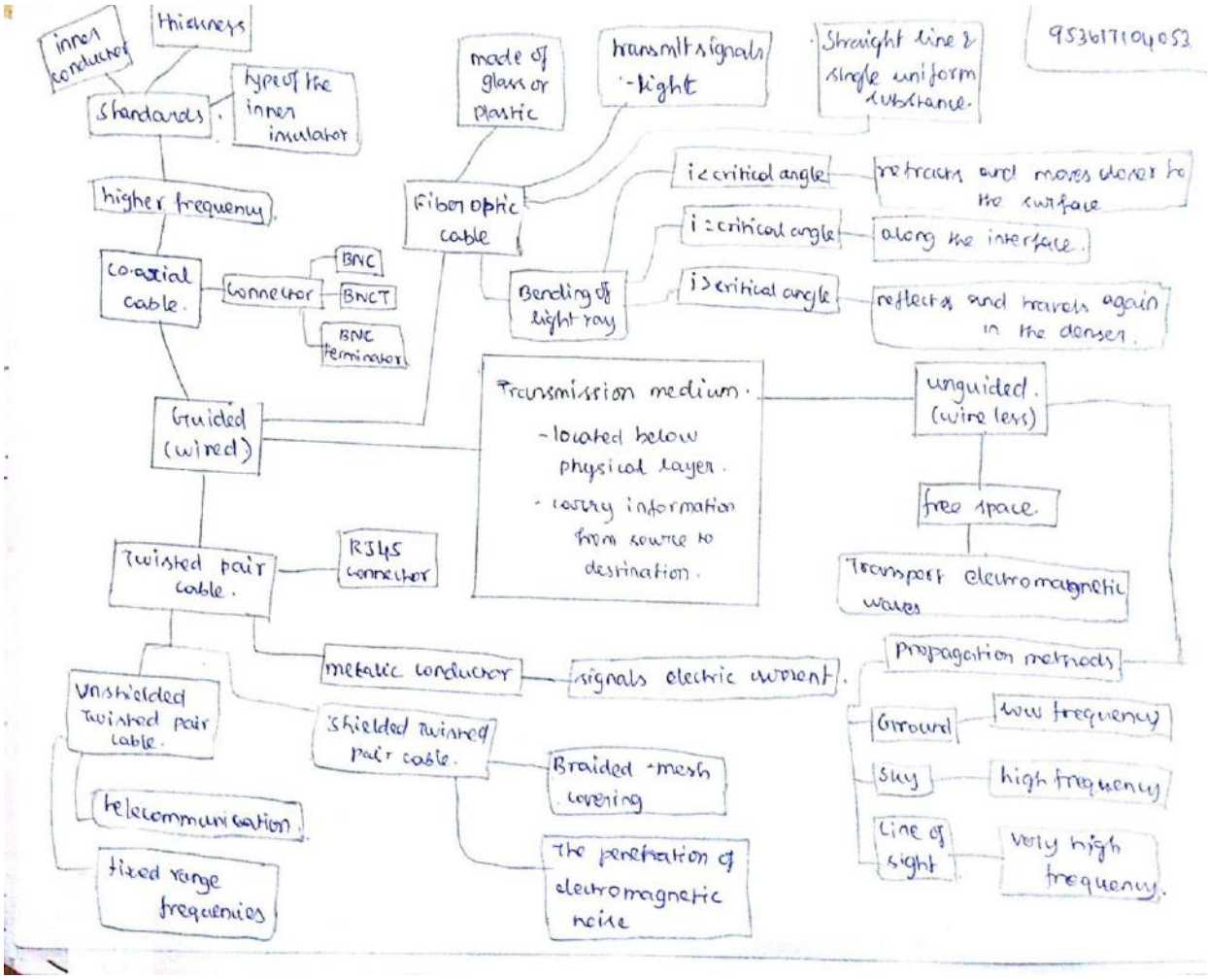
- Mind Maps are a great way for students to make notes on all of the information they receive.
- Mind Maps help students to note down only the most important information using key words, and then make connections between facts and ideas visually – keeping all of your topic thoughts together on one sheet
- It made key note making easier to students, as it reduces pages of notes into one single side of paper.
- Mind Map made slow learners to remember the information more quickly .

CO 1: Understand the basic layers and its functions in computer networks.

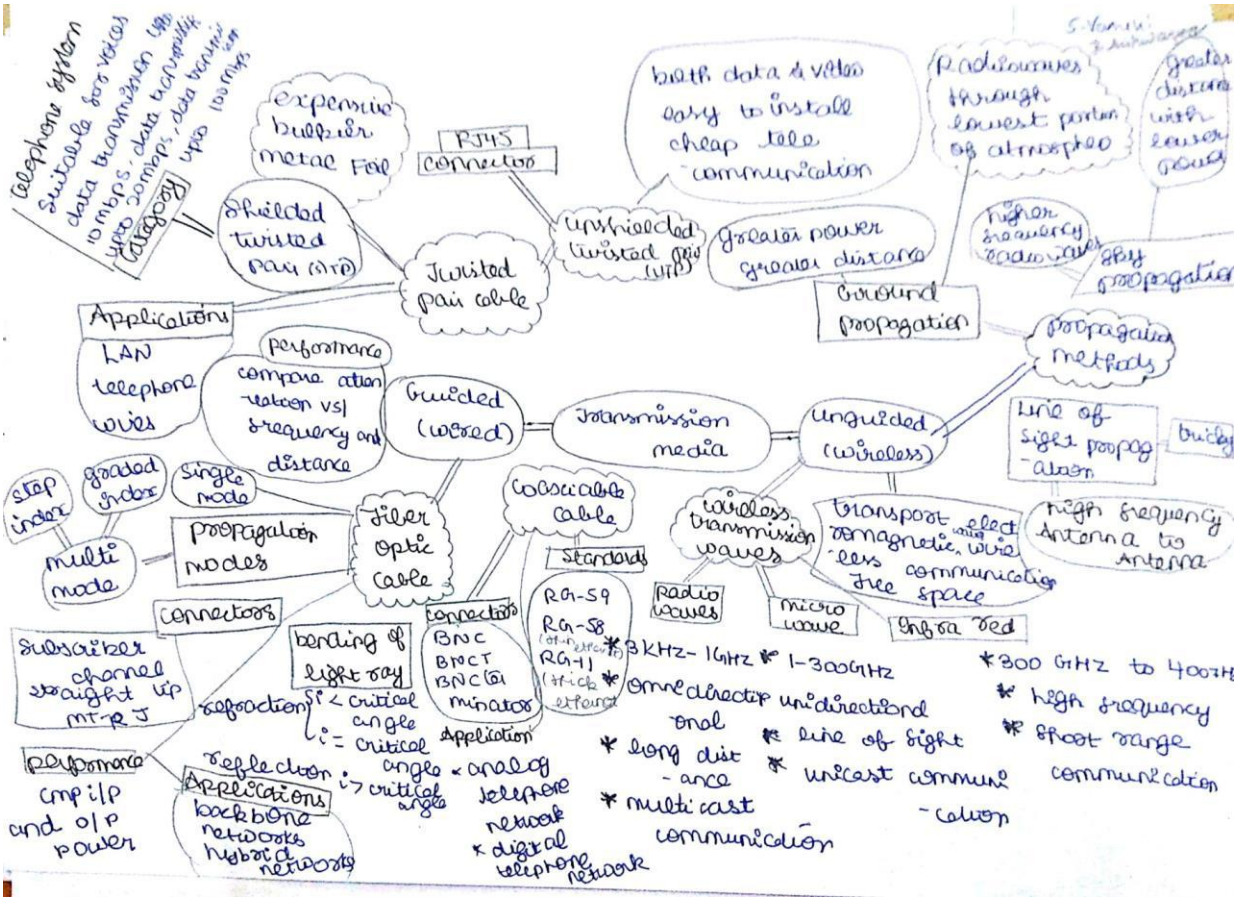

Transmission Media
Guided (wired)
Unguided (wireless)
Free space
Fiber-optic cable
Coaxial cable
Twisted pair cable
Radio wave
Micro wave
Infra red
i < critical angle, refracts.
i = critical angle along interface
i > critical angle, light reflects
BNC connector
BNC T connector
BNC Terminator
Shielded Twisted cable (STP)
Unshielded Twisted pair cable (UTP)
Prevents the penetration of electro-magnetic noise.
Transmitting both data and video
Uses omni-directional
long distance
uses unidirectional
high frequency
short-range communication


Expensive bulkier metal foil
RJ45
connector
both data & video
easy to install
cheap
Radiowaves through lowest portion of atmosphere
greater distance with lower power
Shielded twisted pair
Twisted Pair cable
unshilded twisted pair
greater power greater distance
Ground Propagation
Propagation methods
Application
Guided (wired)
Transmission media
unguided wireless
LAN
telephone line
fiber optic cable
Propagation modes
wireless transmission waves
transmit electromagnetic wireless communication waves free space
Line of sight Propagation
tricky
high frequency antenna antenna
Radio wave
micro wave
Infrared
multimode
step index
graded index
single mode
3KHz - 1GHz
omnidirectional
long distance
multicast communication
1 - 300 GHz
unidirectional
line of sight
unicast communication
300 GHz to 400THz
high frequency
short range communication
16.7.19
No.
1


Transmission Media
Carry information from a Source to a destination.
Guided (wired)
Consists of Two conductors
higher frequency ranges
Made of glass
Single uniform Substance
Twisted Pair Cable
Coaxial Cable
fiber optic cable
Can be inserted in only one way.
Connectors
Shielded
unshield-ed
BNC Connector
BNCT Connector
BNC Terminator
-Prevents the Penetration of electromag-netic noise.
-transmitting both audio & video.
· fixed range of frequencies.
Unguided (wireless)
Free Space
Wireless Transmiss-ion
Transport electromagnetic waves without using a physical conductor.
Radio Wave
Micro Wave
Infrared
-uses omni directional
- Sending & Receiving antennado not have to be aligned.
-unidirectional.
-antena transmits Microwaves.
- having high frequencies.

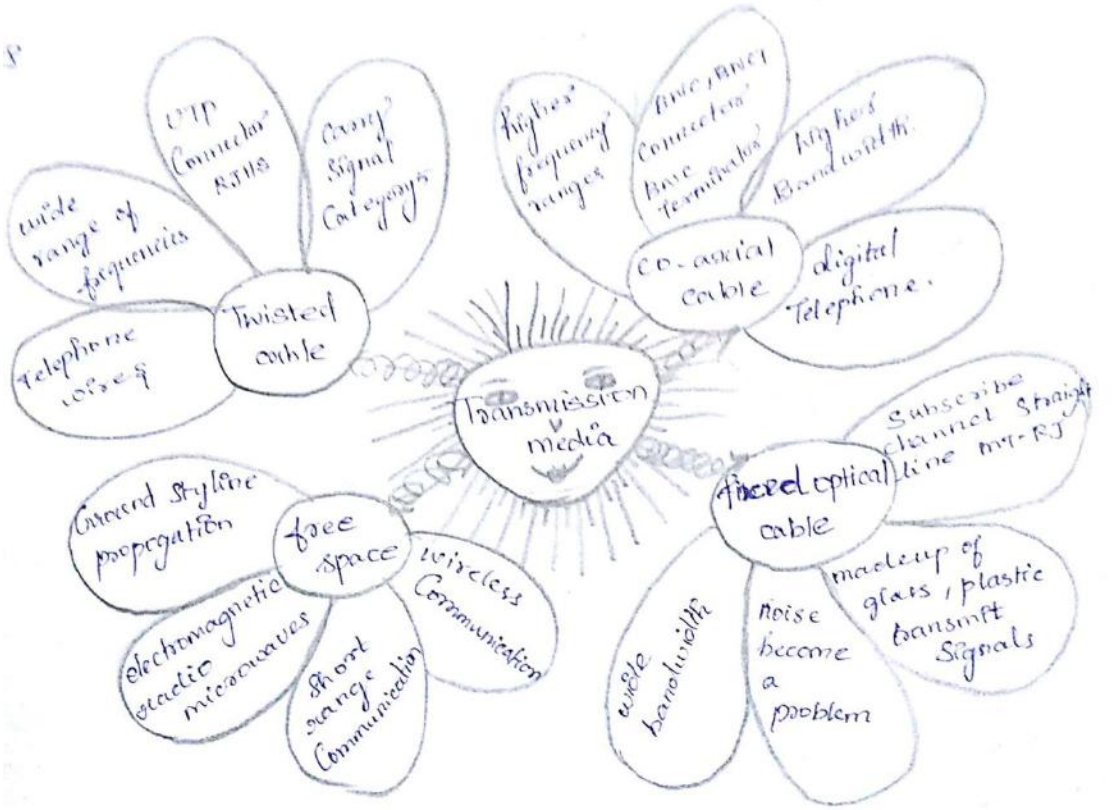

inner conductor
thickness
standards
type of the inner insulator
higher frequency
co-axial cable
connector
BNC
BNCT
BNC terminator
Guided (wired)
twisted pair cable
RJ45 connector
unshielded twisted pair cable
telecommunication
fixed range frequencies
shielded twisted pair cable
Braided mesh covering
the penetration of electromagnetic noise
metalic conductor
signals electric current
made of glass or plastic
transmits signals - light
fiber optic cable
Bending of light ray
i < critical angle
retracts and moves closer to the surface
i = critical angle
along the interface
i > critical angle
reflects and travels again in the denser
Straight line & single uniform substance
Transmission medium
- located below physical layer
- carry information from source to destination
unguided (wire less)
free space
Transport electromagnetic waves
Propagation methods
Ground
low frequency
Sky
high frequency
Line of sight
very high frequency
9536171040053

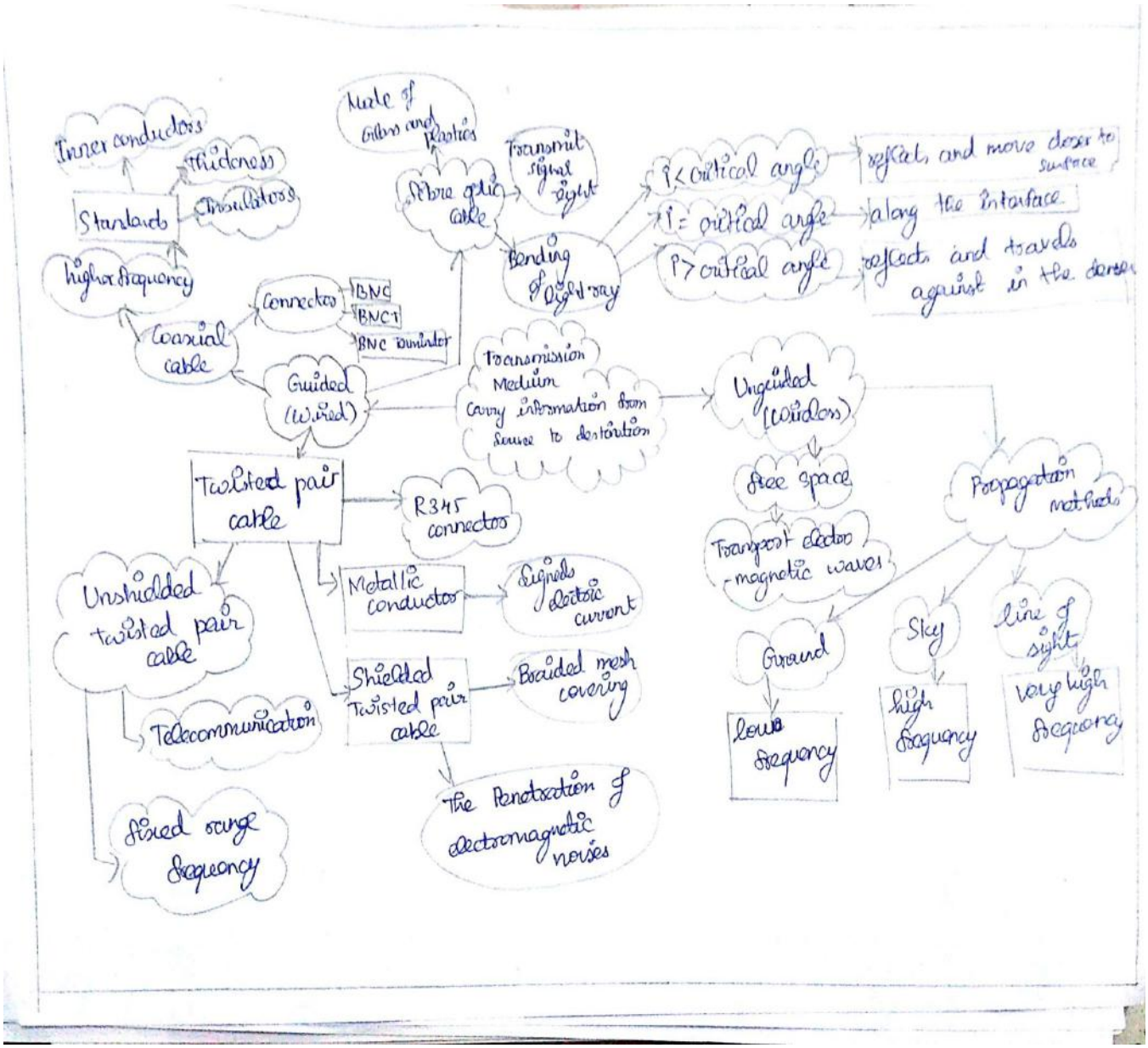
Transmission media
Fixed optical cable
noise become a problem
subscribe channel straight line MT-RJ
made up of glass, plastic transmit signals
wide band width
Coaxial cable
higher frequency ranges
BNC, BNCT connector BNC terminator
higher Bandwidth
twisted cable
carry signal categorys
UTP connector RJ45
wide range of frequencies
telephone wires
free space
Ground styline propagation
electromagnetic, radio microw -aves
wireless communicat -ion
Short range communication

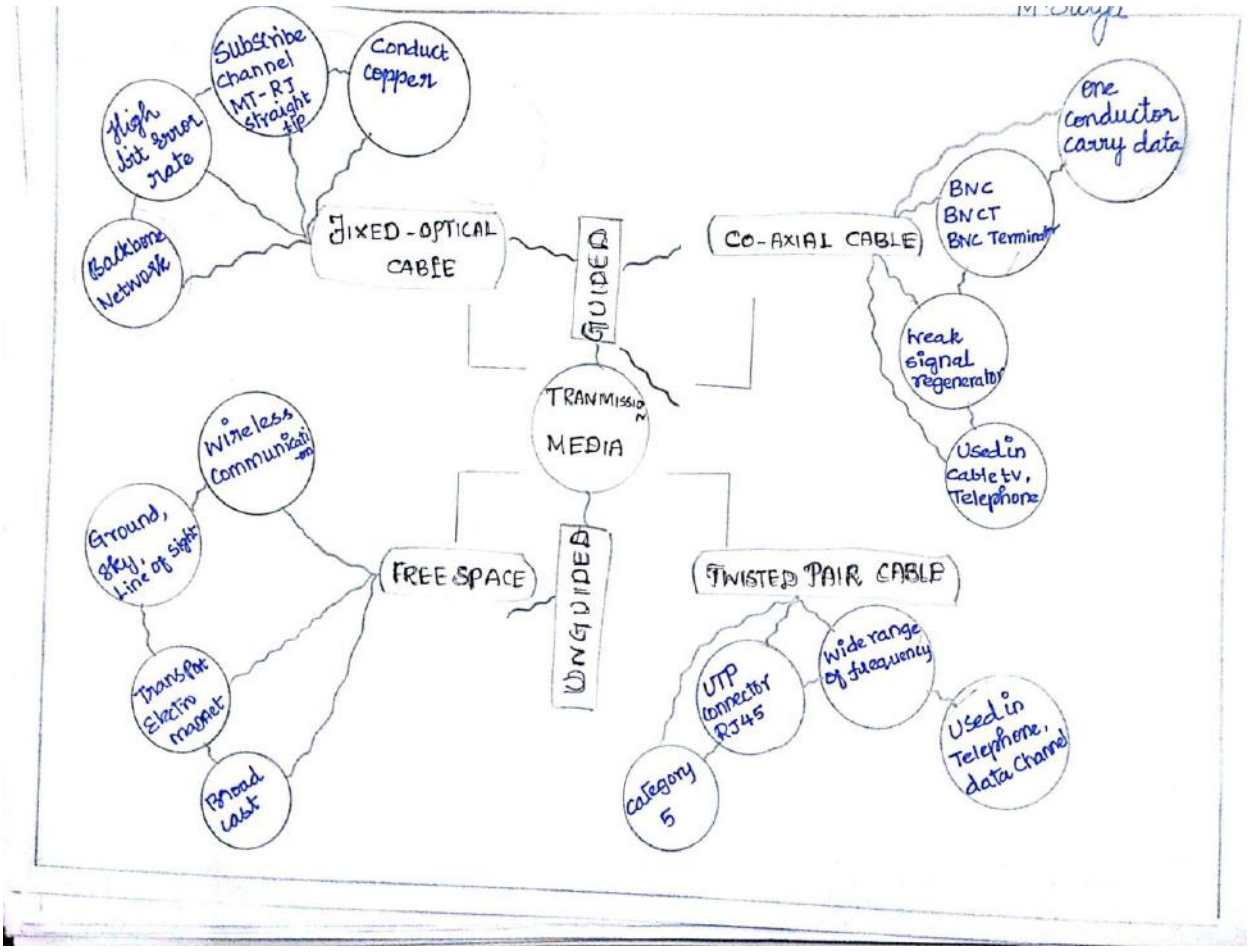


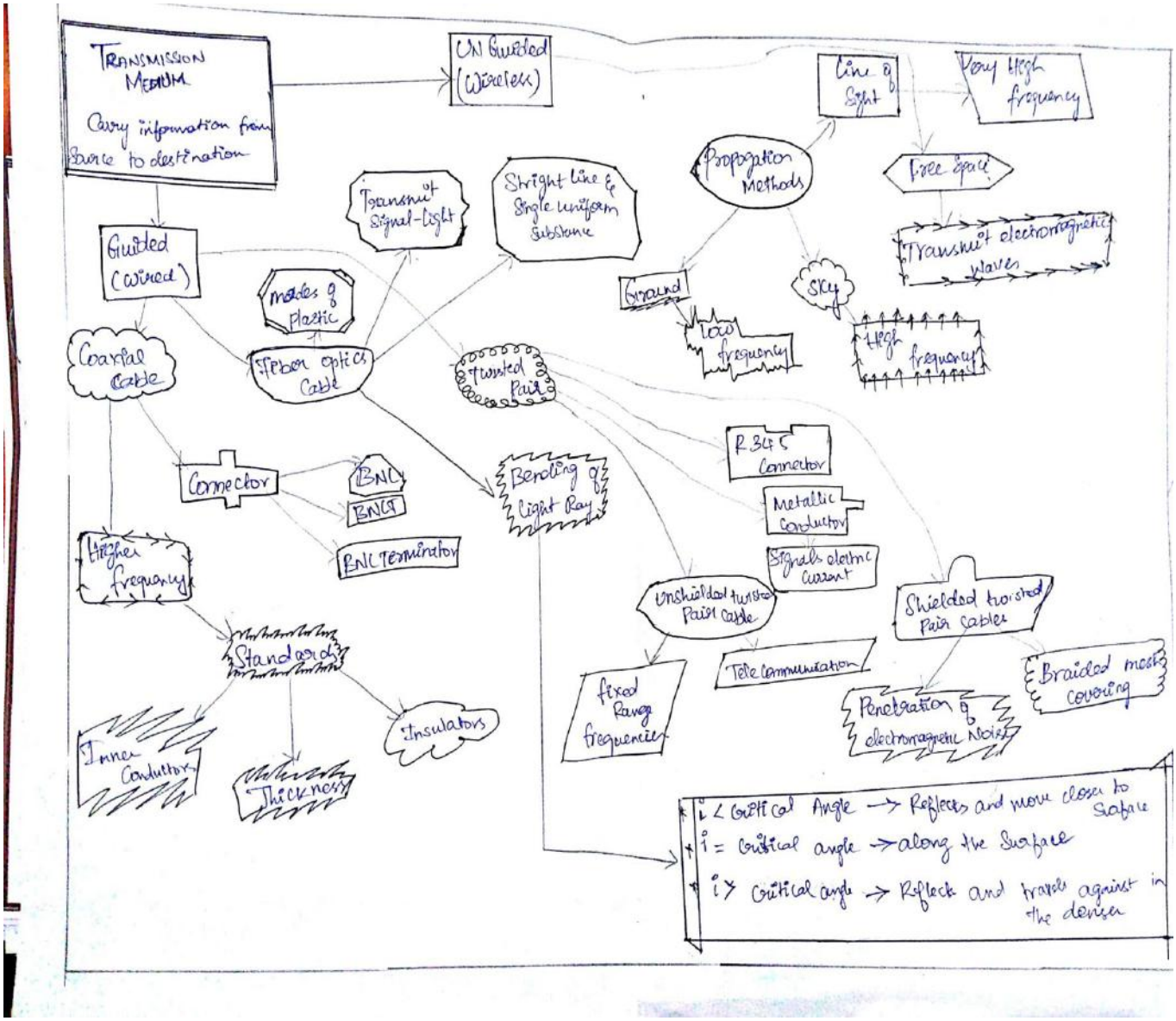
Telephone system
suitable for voices
data transmission upto 10 mbps, data transmission upto 20 mbps, data transmission upto 100 mbps
Category
expensive bulkier metal Foil
RJ45 connector
both data & video easy to install cheap tele communication
Radiowaves through lowest portion of atmosphere
greater distance with lower power
Shielded twisted pair (STP)
Twisted pair cable
unshielded twisted pair (UTP)
greater power greater distance
higher frequency radiowaves
sky propagation
Ground propagation
Propagation methods
Applications
LAN telephone wires
Performance
compare attenuation vs frequency and distance
Guided (wired)
Transmission media
Unguided (wireless)
Line of sight propagation
tricky
step index
graded index
single mode
multi mode
propagation modes
Fiber optic cable
Coaxiable cable
Standards
wireless transmission waves
transport electromagnetic wave wireless communication free space
high frequency Antenna to Antenna
Radio waves
micro wave
Infra red
connectors
subscriber channel straight tip MT-RJ
bending of light ray
refraction
i < critical angle
i = critical angle
i > critical angle
reflection
connectors
BNC
BNCT
BNC terminator
RG-59
RG-58
RG-11
Application
analog telephone network
digital telephone network
* 3KHz - 1GHz
* 1-300GHz
* omnidirectional
* long distance
* multicast communication
* unidirectional
* line of sight
* unicast communication
* 300 GHz to 400GHz
* high frequency
* short range communication
performance
cmp i/p and o/p power
Applications
backbone networks
hybrid networks

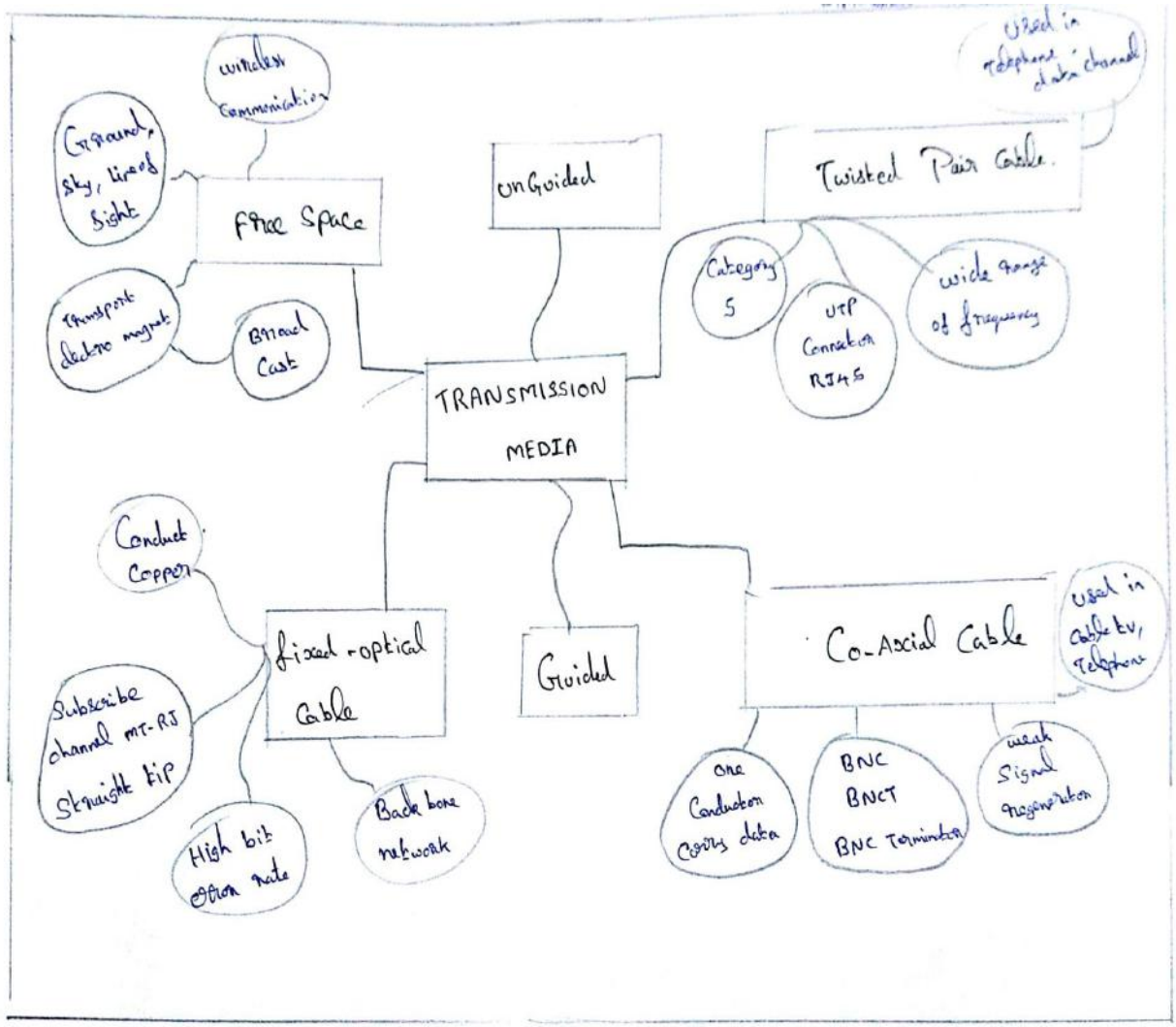
Types
1. shielded
2. unshielded
Performance
compare attenuation versus distance and frequency measured in db/km pass wide range of frequency
Application
used in telephone lines.
Propogation mode
single mode
multimode
Ratio of diameter of core to cladding
Twisted pair
consist of two conductors twisted together
connectors
SC connector
ST connector
MT-RJ connector
fibre optic cable
transmit signal in form of light
Performance
compare input power to output power
high bit error rate
noise become problem
Guided media
Provide a conduit from one device to another.
Transmission medium
carries information from source to destination
unguided media
transport em waves without physical conductor
Propogation method
Ground propagation
Sky propagation
line-of-sight propagation
coaxial cable
carries signal of high frequency
connector
BNC
Performance
Attenuation is much higher
higher bandwidth
Application
widely used in analog telephone networks.
Radiowaves
Omnidirectional
can travel long distance
can receive signal inside buildings
multicast communication
Microwaves
unicast communication
High frequency cannot penetrate
Microwave band - 299 GHz
frequency range 1-300 GHz
Infrared waves
frequency range 300 GHz - 400 THz
short range communication
uses line-of-sigh propagation


Transmission media
Twisted cable
UTP Connector RJ45
Carry Signal Categorys
wide range of frequencies
Telephone wires
Co-axial cable
higher frequency ranges
BNC, BNCT Connector
BNC Terminator
higher Bandwidth
digital Telephone.
Fixed optical cable
Subscribe channel straight line MT-RJ
madeup of glass, plastic transmit Signals
noise become a problem
wide bandwidth
free space
Ground Styline propogation
wireless Communication
electromagnetic radio microwaves
Short range Communication


Inner conductors
thickness
Standards
insulators
higher frequency
Coaxial cable
Connectors
BNC
BNCT
BNC twinter
Guided (Wired)
Made of Glass and plastics
Fibre optic cable
Transmit signal light
Bending of light ray
θ < critical angle
reflect, and move closer to surface
θ = critical angle
along the interface
θ > critical angle
reflects and travels against in the denser
Transmission Medium
Carry information from source to destination
Unguided (Wireless)
free space
Transport electro magnetic waves
Propagation methods
Ground
Sky
line of sight
low frequency
high frequency
very high frequency
Twisted pair cable
R345 connectors
Unshielded twisted pair cable
Metallic conductor
Signals electric current
Shielded Twisted pair cable
Braided mesh covering
Telecommunication
fixed range frequency
The Penetration of electromagnetic noises


TRANMISSION MEDIA
GUIDED
FIXED-OPTICAL CABLE
Subscribe channel MT-RJ straight tip
Conduct copper
High bit error rate
Backbone Network
CO-AXIAL CABLE
One conductor carry data
BNC BNCT BNC Terminator
Weak signal regenerator
Used in Cable tv, Telephone
UNGUIDED
FREE SPACE
Wireless Communication
Ground, sky, Line of sight
Transfer Electro magnet
Broad cast
TWISTED PAIR CABLE
UTP connector RJ45
Wide range of frequency
Used in Telephone, data Channel
category 5


TRANSMISSION MEDIUM
Carry information from Source to destination
UN Guided (Wireless)
Guided (Wired)
Line of Sight
Very High frequency
Propagation Methods
Free Space
Transmit Signal-Light
Stright line & Single uniform Substance
Transmit electromagnetic waves
Ground
Sky
Low frequency
High frequency
Modes of Plastic
Coaxial Cable
Fiber optics Cable
Twisted Pair
RJ45 Connector
Connector
BNC
BNCT
BNC Terminator
Bending of Light Ray
Metallic Conductor
Signals electric current
Higher frequency
Unshielded twisted Pair cable
Shielded twisted Pair cables
Standard
Tele communication
Braided mesh covering
fixed Range frequencies
Penetration of electromagnetic Noise
Insulators
Inner Conductors
Thickness
i < Critical Angle → Reflects and move closer to Surface
i = Critical angle → along the Surface
i > Critical angle → Reflect and travels against in the denser


TRANSMISSION MEDIA
unGuided
Free Space
Wireless Communication
Ground, sky, line of Sight
Transport electro magnt
Broad Cast
Twisted Pair Cable
Used in telephone data channel
Category 5
UTP Connector RJ45
wide range of frequency
Guided
fixed - optical Cable
Conduct Copper
Subscribe channel MT-RJ Straight Tip
High bit ration rate
Back bone network
Co-Axial Cable
Used in cable tv, Telephone
One Conductor carry data
BNC BNCT BNC Terminator
weak Signal regenerator

Transmission Media
Guided (wired)
Twisted pair cable
shielded twisted pair (STP)
expensive
bulkier
metal foil
RJ45 connector
unshielded twisted pair (UTP)
both data & video easy to install
cheap
telecommunication
greater power greater distance
Applications
LAN
telephone lines
Performance
compare attenuation vs frequency and distance.
Coaxial cable
Fiber Optic Cable
step index
graded index
single mode
multi mode
propagation modes
connectors
subscriber channel
straight tip
MT-RJ
bending of light ray
refraction
i < critical angle
i = critical angle
reflection i > critical angle
performance
cmp i/p and o/p power.
Applications
backbone networks
hybrid networks
Application
analog telephone network
digital telephone network
performance
high attenuation
frequent use of repeaters
connectors
BNC
BNC T
BNC terminator
standards
RG-59
RG-58 (thin ethernet)
RG-11 (thick ethernet)
Unguided (wireless)
wireless transmission waves.
Radio waves
*3KHz-1GHz
*omnidirectional
*long distance.
*multicast communication
micro wave
*1-300GHz
*unidirectional
*line of sight
*unicast communication
Infrared
*300GHz to 400THz
*high frequency
*Short range communication
transport electromagnetic waves
wireless communication
Free space
propagation methods
line of sight propagation
tricky
high frequency
Antenna to Antenna
Ground propagation
Radiowaves through lowest portion of atmosphere
greater distance with lower power
higher frequency radio waves
Sky propagation