



# RAMA UNIVERSITY

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## FACULTY OF ENGINEERING & TECHNOLOGY

### DCS-503 Computer Networks

#### Lecture-11

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# OUTLINE

➤ **UNGUIDED MEDIA: WIRELESS**

➤ **PROPAGATION METHODS**

➤ **BANDS**

➤ **WIRELESS TRANSMISSION WAVES**

➤ **RADIO WAVES**

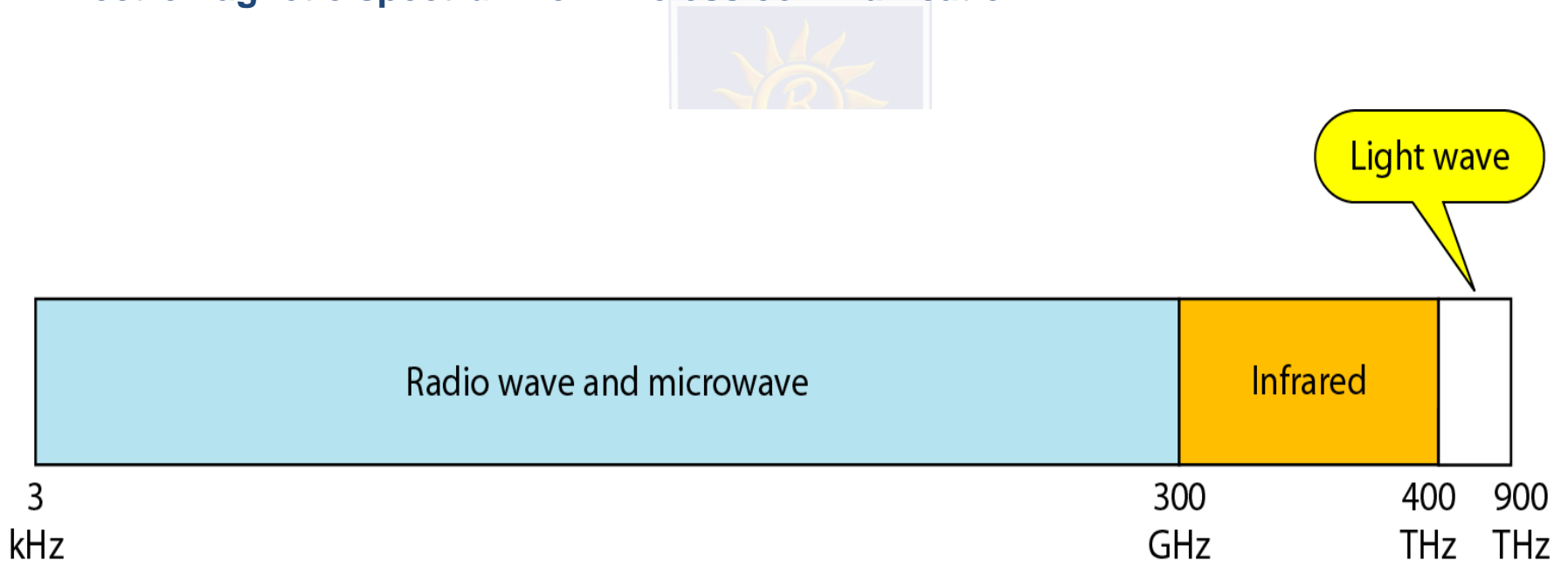
➤ **MICRO WAVES**



# UNGUIDED MEDIA: WIRELESS

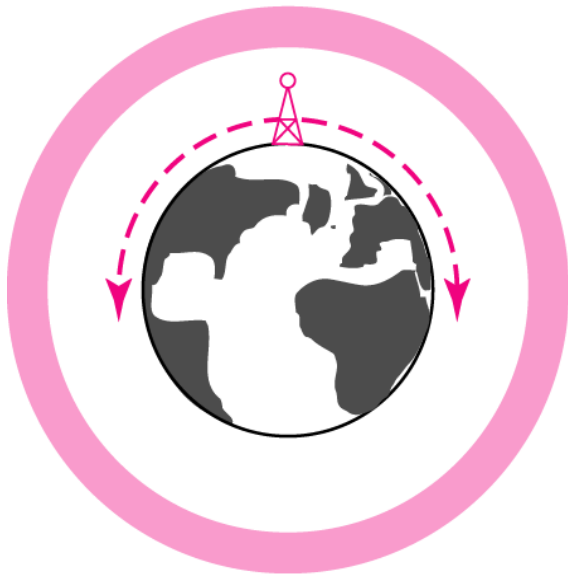
Unguided media transport electromagnetic waves without using a physical conductor. This type of communication is often referred to as wireless communication.

## Electromagnetic spectrum for wireless communication



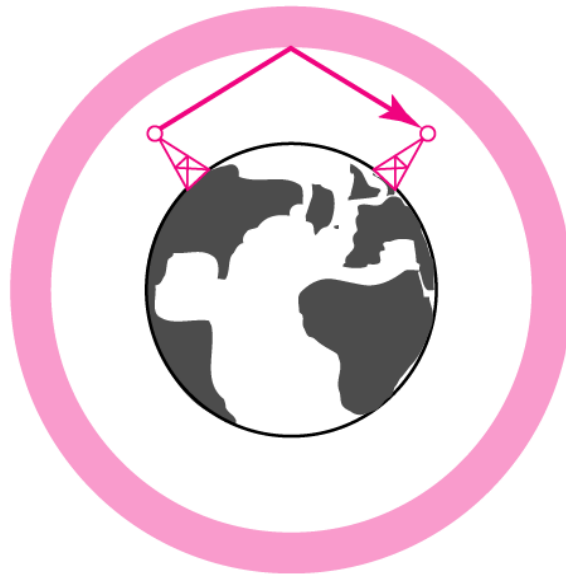
# PROPAGATION METHODS

Ionosphere



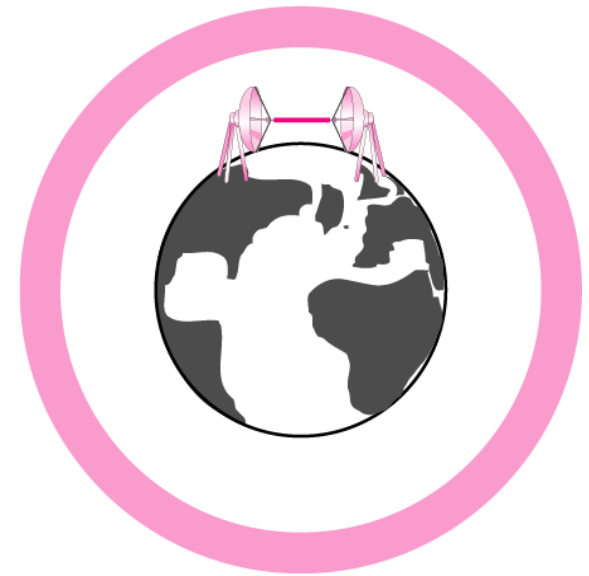
Ground propagation  
(below 2 MHz)

Ionosphere



Sky propagation  
(2–30 MHz)

Ionosphere

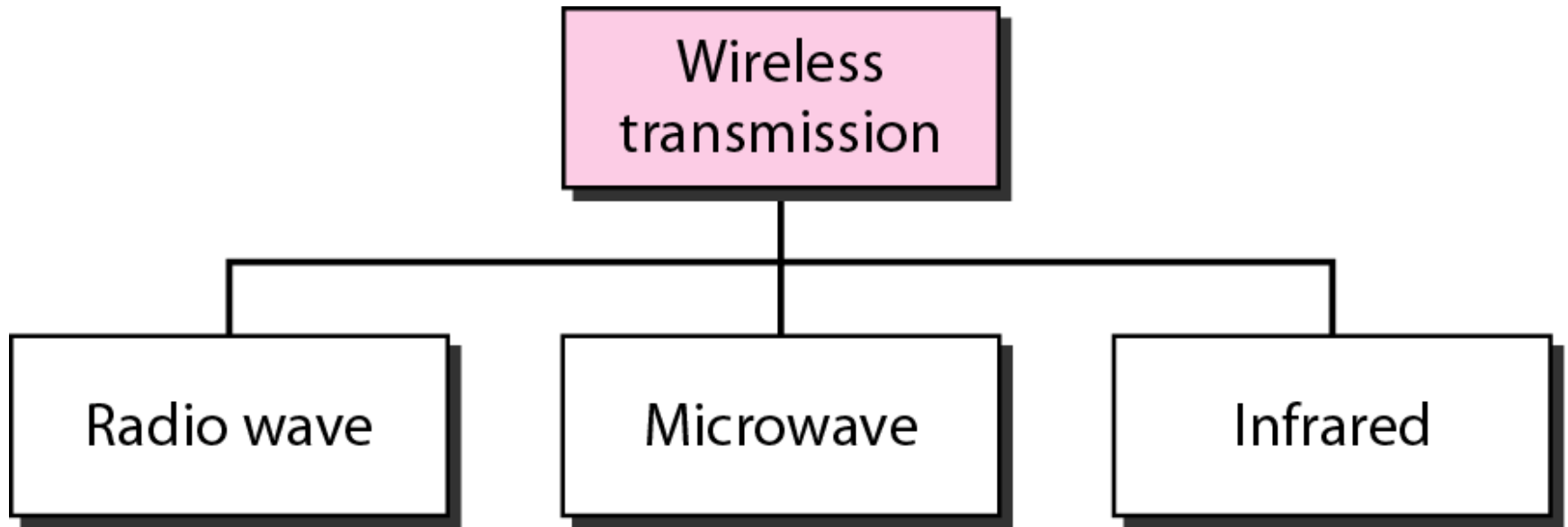


Line-of-sight propagation  
(above 30 MHz)

# BANDS

<i>Band</i>	<i>Range</i>	<i>Propagation</i>	<i>Application</i>
VLF (very low frequency)	3–30 kHz	Ground	Long-range radio navigation
LF (low frequency)	30–300 kHz	Ground	Radio beacons and navigational locators
MF (middle frequency)	300 kHz–3 MHz	Sky	AM radio
HF (high frequency)	3–30 MHz	Sky	Citizens band (CB), ship/aircraft communication
VHF (very high frequency)	30–300 MHz	Sky and line-of-sight	VHF TV, FM radio
UHF (ultrahigh frequency)	300 MHz–3 GHz	Line-of-sight	UHF TV, cellular phones, paging, satellite
SHF (superhigh frequency)	3–30 GHz	Line-of-sight	Satellite communication
EHF (extremely high frequency)	30–300 GHz	Line-of-sight	Radar, satellite

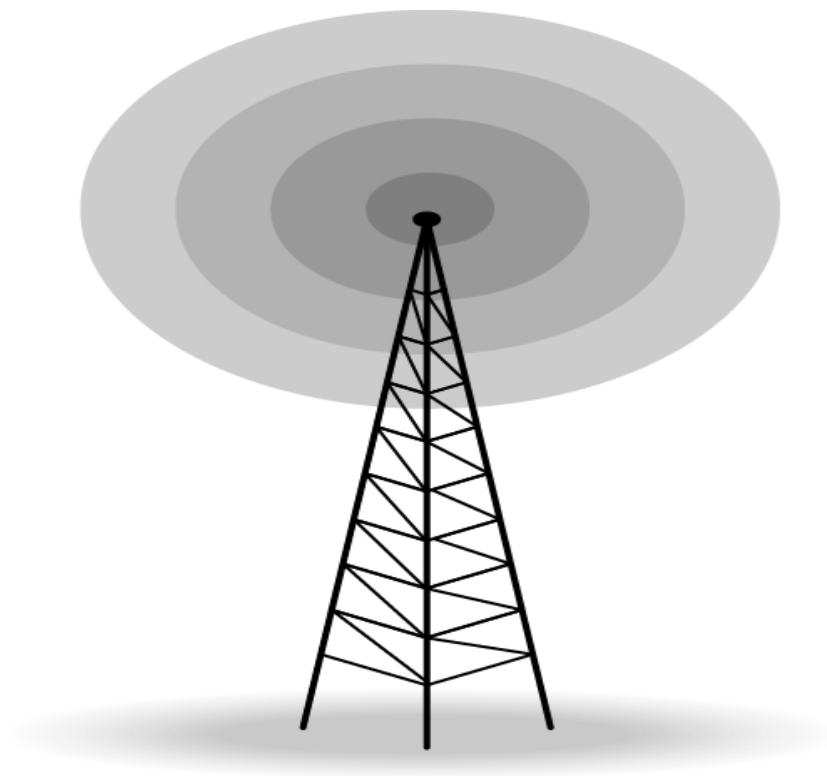
# WIRELESS TRANSMISSION WAVES



# RADIO WAVES

Radio waves are used for multicast communications, such as radio and television, and paging systems. They can penetrate through walls .Highly regulated. Use omni directional antennas

## Omni directional antenna



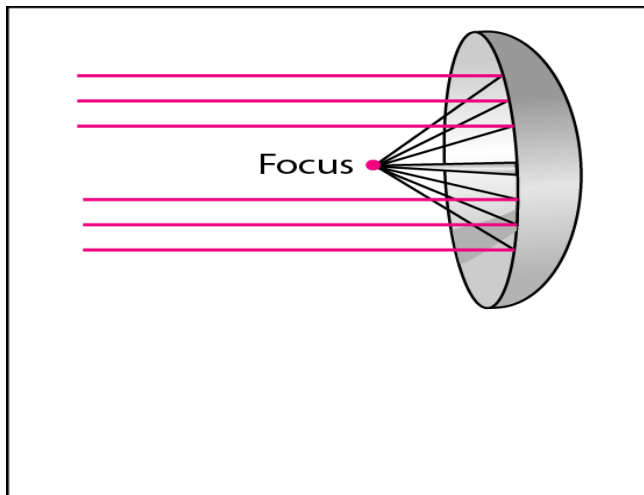
# MICRO WAVES

Microwaves are used for unicast communication such as cellular telephones, satellite networks, and wireless LANs.

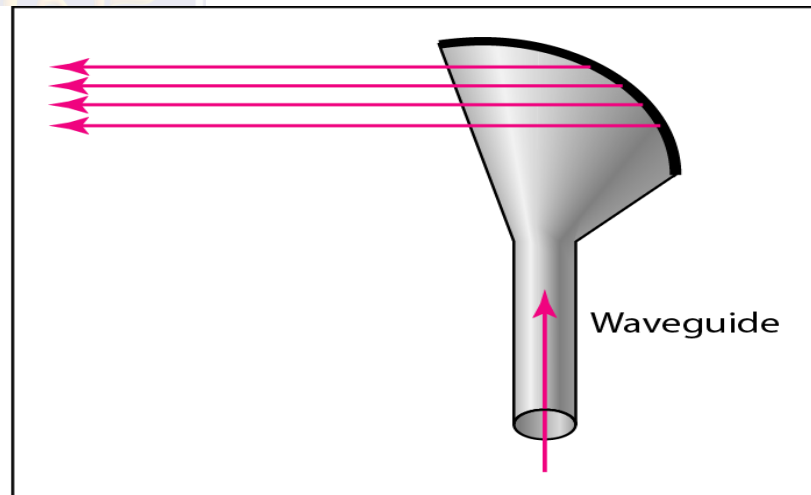
Higher frequency ranges cannot penetrate walls.

Use directional antennas - point to point line of sight communications

## Unidirectional antenna



a. Dish antenna



b. Horn antenna



# Multiple Choice Question

## MUTIPLE CHOICE QUESTIONS:

Sr no	Question	Option A	Option B	OptionC	OptionD
1	Which layer is used to link the network support layers and user support layers?	session layer	data link layer	transport layer	network layer
2	TCP/IP model was developed _____ the OSI model.	prior to	after	simultaneous to	with no link to
3	Which layer is responsible for process to process delivery in a general network model?	network layer	transport layer	session layer	data link layer
4	Which address is used to identify a process on a host by the transport layer?	physical address	logical address	port address	specific address
5	Which layer provides the services to user?	application layer	session layer	presentation layer	physical layer

# REFERENCES

- <http://www.engppt.com/2009/12/networking-fourzan-ppt-slides.html>

