INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad - 500 043

ELECTRONICS AND COMMUNICATION ENGINEERING

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	**CELLULAR AND MOBILE COMMUNICATION**
Course Code	:	AEC520
Program	:	B.Tech
Semester	:	VI
Branch	:	Electronics and Communication Engineering
Section	:	A
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Course Faculty	:	Mr. B. Santhosh Kumar, Assistant Professor, Department of ECE

OBJECTIVES:

I	Analyze and design wireless and mobile cellular systems.
II	Understand impairments due to multipath fading channel and be able simulate standard stochastic channel models for various environments.
III	Evaluate the fundamental techniques to overcome the different fading effects.
IV	Interpret current and proposed cellular technologies
V	Able to work in advanced research wireless and mobile cellular programs.

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	COs	CLO	CLO Code
		UNIT-I				
1	Define wireless network .	A wireless network is a computer network that uses wireless data connections between network nodes.	Understand	CO 1	CLO 1	AEC520.01
2	Define communication.	Process by which information is exchanged between individuals through a common system of symbols, signs, or behavior.	Understand	CO 1	CLO 1	AEC520.01
3	What is network?	A network consists of two or more computers that are linked in order to share resources, exchange files, or allow electronic communications.	Remember	CO 1	CLO 1	AEC520.01
4	Define frequency reuse.	Frequency reuse is the process of using the same radio frequencies on radio transmitter sites within a geographic area that are separated by sufficient distance to cause minimal interference with each other.	Understand	CO 1	CLO 2	AEC520.02
5	Define Handoff.	A handoff refers to the process of transferring an active call or data session from one cell in a cellular network to another or from one channel in a cell to another.	Understand	CO 1	CLO 2	AEC520.02

6	What is interference in communication?	Incommunications and electronics, especially telecommunications, interference is anything which modifies, or disrupts a signal as it travels along a channel between a source and a receiver.	Remember	CO 1	CLO 3	AEC520.03
7	What is System capacity?	System capacity is formally defined as the maximum of the product of the number of users per cell times the user spectral efficiency for a given maximum outage probability.	Remember	CO 1	CLO 2	AEC520.02
8	What is wireless systems?	A wireless network is a computer network that uses wirelessdata connections between network nodes.	Remember	CO 1	CLO 2	AEC520.02
9	What is cell splitting?	Cell splitting is the process of subdividing a congested cell into smaller cells such that each smaller cell has its own base station with Reduced antenna height and Reduced transmitter power.	Remember	CO 1	CLO 2	AEC520.02
10	Define trunking.	A trunk is a communications line or link designed to carry multiple signals simultaneously to provide network access between two points.	Understand	CO 1	CLO 1	AEC520.01
11	What is Co -channel reuse ratio?	The co-channel reuse ratio in a cellular system is defined as the ratio of the distance between cells using related channels to the cell radius . If a pair of terminals in two cells are using the same channel.	Remember	CO 1	CLO 4	AEC520.04
12	What is a cluster in a cellular system?	Cluster is used to reduced co-channel interference and adjacent channel interference. A cell is basic geographical area covered by cellular transmitters for communication in cellular system.	Remember	CO 1	CLO 1	AEC520.01
13	What is umbrella cell?	Umbrella cell concept is used to provide large area to high speed users while small area coverage to users that travels at low speeds..	Remember	CO 1	CLO 4	AEC520.04
14	Define Practical handoff.	A Practical handoff refers to the process of transferring an active call or data session from one cell in a cellular network to another or from one channel in a cell to another. A well-implemented handoff is important for delivering uninterrupted service to a caller or data session user.	Understand	CO 1	CLO 2	AEC520.02
UNIT-II						
1	Define mobile Radio propagation.	Radio propagation is the behavior of radio waves as they travel, or are propagated, from one point to another, or into various parts of the atmosphere.	Understand	CO 2	CLO 5	AEC520.05
2	Define free Space Propagation.	The free space propagation model assumes a transmit antenna and a receive antenna to be located in an otherwiseempty environment. Neither absorbing obstacles nor reflecting surfaces are considered.	Understand	CO 2	CLO 5	AEC520.05
3	Define Electric field.	Electric field lines around a positively-charged particle point radially outward, and the lines around a negatively-charged particle point radially inward.	Understand	CO 2	CLO 5	AEC520.05
4	Define reflection.	Reflective listening is a communication strategy involving two key steps: seeking to understand a speaker's idea, then offering the idea back to the speaker, to confirm the idea has been understood correctly.	Understand	CO 2	CLO 5	AEC520.05

5	Define dielectrics.	A dielectric (or dielectric material) is an electrical insulatorthat can be polarized by an applied electric field.Dielectricsare important for explaining various phenomena.	Understand	CO 2	CLO 6	AEC520.06
6	Define brewster angle.	Brewster's angle is an angle of incidence at which light with a particular polarization is perfectly transmitted through a transparent dielectric surface, with no reflection. When unpolarized light is incident at this angle, the light that is reflected from the surface is therefore perfectly polarized.	Understand	CO 2	CLO 6	AEC520.06
7	Define fresnel zone.	A Fresnel zone, named after physicist Augustin-Jean Fresnel, is one of a series of confocal prolate ellipsoidal regions of space between and around a transmitting antenna and a receiving antenna system.	Understand	CO 2	CLO 6	AEC520.06
8	Define knife-edge diffraction.	In electromagnetic wave propagation, the knife-edge effect or edge diffraction is a redirection by diffraction of a portion of the incident radiation that strikes a well-defined obstacle such as a mountain range or the edge of a building.	Understand	CO 2	CLO 6	AEC520.06
9	Define okumura model.	The Okumura model is a Radio propagation modelthat was built using the data collected in the city of Tokyo, Japan. The model is ideal for using in cities with many urban structures but not many tall blocking structures.	Understand	CO 2	CLO 6	AEC520.06
10	Define microcell.	a small mobile phone base station connected to the phone network via the Internet, typically used to improve mobile phone reception within a particular area.	Understand	CO 2	CLO 6	AEC520.06
11	Define log-distance path loss.	The log-distance path loss model is a radio propagation model that predicts thepath loss a signal encounters inside a building or densely populated areas overdistance.	Understand	CO 2	CLO 6	AEC520.06
12	Define attenuation factor.	The ratio of the incident radiation dose or dose rate to the radiation dose or dose rate transmitted through a shielding material. This is the reciprocal of the transmission factor.Dictionary of Military and Associated Terms.	Understand	CO 2	CLO 7	AEC520.07
13	Define ray tracing.	Ray tracing is a method for calculating the path of waves or particles through a system. The method is practiced in two distinct forms:Ray tracing (graphics), which is used for 3D image generation.	Understand	CO 2	CLO 7	AEC520.07
14	Define site specific.	Site-specific art is artwork created to exist in acertain place. Typically, the artist takes the location into account while planning and creating the artwork.	Understand	CO 2	CLO 7	AEC520.07
15	Define (Two-Ray) mode.	The Two-Rays Ground Reflected Model is a radio propagation model which predicts the path losses between a transmitting antenna and a receiving antenna .	Understand	CO 2	CLO 8	AEC520.08
UNIT-III						
1	Define doppler shift.	Doppler shift occurs when the transmitter of a signal is moving in relation to the receiver. The relative movement shifts the frequency of the signal,making it different at the receiver than at the transmitter.	Understand	CO 3	CLO 9	AEC520.09

2	Define small scale fading.	Small scale fading is a characteristic of radio propagation resulting from the presence reflectors and scatterers that cause multiple versions of the transmitted signal to arrive at the receiver.	Understand	CO 3	CLO 9	AEC520.09
3	Define impulse response.	The impulse response, or impulse response function (IRF), of a dynamic system is its output when presented with a brief input signal, called an impulse.	Understand	CO 3	CLO 9	AEC520.09
4	Define spread spectrum.	Intelecommunicationand radio communication,spread-pectrum techniques are methods by which a signal (e.g., an electrical, electromagnetic).	Understand	CO 3	CLO 9	AEC520.09
5	Define Channel sounding.	Channel sounding is a technique that evaluates the radio environment for wireless communication, especially MIMO systems.	Understand	CO 3	CLO 10	AEC520.10
6	Define Mobile.	A mobile phone is a wireless handheld device that allows users to make and receive calls and to send text messages, among other features.	Understand	CO 3	CLO 10	AEC520.10
7	Define coherence bandwidth.	Coherence bandwidth is a statistical measurement of the range of frequencies over which the channel can be considered "flat", or in other words the approximate maximum bandwidth .	Understand	CO 3	CLO 10	AEC520.10
8	Define doppler spread.	Doppler spread is a measure of the spectral broadening caused by the time rate of change of the mobile radio channel, and is defined as the range of frequencies over which the received Dopplerspectrum is essentially non-zero.	Understand	CO 3	CLO 10	AEC520.10
9	Define Scale fading.	Small scale fading or simply fading is used to describe the rapid fluctuations of the amplitudes, phases, or multi path delays of radio signal over a short period of time or travel distance.	Understand	CO 3	CLO 10	AEC520.10
10	Define Fading effects.	In wireless communications,fading is variation of the attenuation of a signal with various variables.These variables include time, geographical position.	Understand	CO 3	CLO 10	AEC520.10
11	Define frequency selective fading.	Frequencyselectivefading isaradiopropagation anomaly caused by partial cancellation of a radio signal by itself the signal arrives at the receiver by two different paths, and at least one of the paths is changing.	Understand	CO 3	CLO 10	AEC520.10
12	Define flat fading.	A type of small scale fading where all frequency signal components experience the same magnitude offading; corresponds to the case where the signal bandwidth is smaller than the channel coherence bandwidth.	Understand	CO 3	CLO 10	AEC520.10
13	Define fast fading.	Fading is term used to describe the fluctuations in a received signal as a result of multipath components. Several replicas of the signal arrive at the receiver, having traversed different propagation paths.	Understand	CO 3	CLO 10	AEC520.10
14	Define Scale fading.	Small scale fading or simply fading is used to describe the rapid fluctuations of the amplitudes, phases, or multi path delays of radio signal over a short period of time or travel distance.	Understand	CO 3	CLO 10	AEC520.10

		UNIT-IV				
1	Define scanning diversity.	Scanning is reading a text quickly in order to find specific information, e.g. figures or names. It can be contrasted with skimming, which is reading quickly to get a general idea of meaning.	Understand	CO 4	CLO 12	AEC520.12
2	Define selection diversity.	Selection diversity approach is one way out - Withselection diversity, the receiver selects the antenna with the highest received signal power and ignore observations from the other antennas.	Understand	CO 4	CLO 12	AEC520.12
3	Define receiver diversity.	The receiver in a diversity combining system. The outage probability is defined as the probability that the output SNR.	Understand	CO 4	CLO 13	AEC520.13
4	Define equal gain combining.	Equal-Gain Combining Diversity. Various techniques are known to combine the signals from multiple diversity branches. In Equal Gain Combining, each signal branch weighted with the same factor, irrespective of the signal amplitude.	Understand	CO 4	CLO 14	AEC520.14
		UNIT-V				
1	Define wireless networks.	Wireless networks are computer networks that are not connected by cables of any kind. The use of a wireless network enables enterprises to avoid the costly process of introducing cables into buildings .	Understand	CO 5	CLO 15	AEC520.15
2	Define wireless local area network.	A wireless local area network (WLAN) is a wireless distribution method for two or more devices that use high-frequency radio waves and often include an access point to the Internet.	Understand	CO 5	CLO 15	AEC520.15
3	What is topology?	A network topology may be physical, mapping hardware configuration, or logical, mapping the path that the data must take in order to travel around the network.	Remember	CO 5	CLO 16	AEC520.16
4	Define Star topology.	A star topology is a topology for a Local Area Network (LAN) in which all nodes are individually connected to a central connection point, like a hub or a switch.	Understand	CO 5	CLO 16	AEC520.16
5	What mesh topology?	A mesh topology can be a full mesh topology or a partially connected mesh topology. In a full mesh topology.	Remember	CO 5	CLO 17	AEC520.17
6	What is tree Topology?	A tree network, or star-bus network, is a hybrid network topology in which star networks are interconnected via bus networks. Tree networks are hierarchical.	Remember	CO 5	CLO 17	AEC520.17

7	Define WLL.	Wireless local loop (WLL), is the use of a wireless communications link as the "last mile / first mile" connection for delivering plain old telephone service (POTS) or Internet access (marketed under the term "broadband") to telecommunications customers.	Understand	CO 5	CLO 16	AEC520.09
8	Define Hipper LAN.	HiperLAN (High Performance Radio LAN) is a Wireless LAN standard. It is a European alternative for the IEEE 802.11 standards (the IEEE is an international organization). It is defined by the European Telecommunications Standards Institute.	Understand	CO 5	CLO 15	AEC520.10
9	Define wireless PANs.	A personal area network (PAN) is a computer network for interconnecting devices centered on an individual person's workspace.short-distance wireless network technology such as IRDA, Wireless USB, Bluetooth or ZigBee.	Understand	CO 5	CLO 15	AEC520.10
10	Define bluetooth.	Bluetooth is an open wireless technology standard for transmitting fixed and mobile electronic device data over short distances.	Understand	CO 5	CLO 15	AEC520.10
11	Define wifi.	a facility allowing computers, smartphones, or other devices to connect to the Internet or communicate with one another wirelessly within a particular area.	Understand	CO 5	CLO 16	AEC520.10
12	Define cellular network.	A cellular network or mobile network is a communication network where the last link is wireless. The network is distributed over land areas called cells.	Understand	CO 5	CLO 17	AEC520.10
13	Define global area network.	Global Area Network is a network, composed of interconnected of different networks that cover a unrestricted geographical area. The term is synonymous with Internet.	Understand	CO 5	CLO 17	AEC520.10
14	What is wireless ad hoc network?	A wireless ad hoc network or MANET is a decentralised type of wireless network. The network is ad hoc because it does not rely on a pre-existing infrastructure, such as routers in wired networks or access points in managed wireless networks.	Remember	CO 5	CLO 17	AEC524.10
15	What is mobile ad hoc network?	A mobile ad hoc network, also known as wireless ad hoc network or ad hoc wireless network, is a continuously self-configuring, infrastructure-less network of mobile devices. .	Remember	CO 5	CLO 17	AEC524.10

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