INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad - 500 043

ELECTRONICS AND COMMUNICATION ENGINEERING

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	ANTENNAS AND PROPAGATION
Course Code	:	AEC011
Program	:	B.Tech
Semester	:	V
Branch	:	Electronics and Communication Engineering
Section	:	A,B,C,D
Academic Year	:	2019 – 2020
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OBJECTIVES:

I	To help students to consider in depth the terminology and nomenclature used in the syllabus.
II	To focus on the meaning of new words / terminology/nomenclature

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
	UNIT-I					
1	Define Antenna.	An antenna is a device that transmits and/or receives electromagnetic waves. Electromagnetic waves are often referred to as radio waves.	Remember	CO 1	CLO 2	AEC011.02
2	Define Antenna Factor.	The Antenna Factor (AF) is defined as the ratio of the incident Electromagnetic Field to the output voltage from the antenna.	Understand	CO 1	CLO 1	AEC011.01
3	Define aperture.	An aperture is an opening or hole, for antennas typically this term refers to the opening of a horn antenna.	Remember	CO 1	CLO 2	AEC011.02
4	Define Directivity.	It is a measure of how focused an antenna coverage pattern is in a given direction.	Understand	CO 1	CLO 1	AEC011.01
5	Define Dynamic Range.	It is the range of power between the maximum signal and minimum signal that can be measured.	Understand	CO 1	CLO 2	AEC011.02
6	Define Far Field.	The far field corresponds to an RF source-to-measurement antenna distance great enough that energy radiates from the source only in a radial direction.	Understand	CO 1	CLO 2	AEC011.02
7	Define front-to-back ratio.	It is the ratio of the gain in the maximum direction to that in the opposite direction	Understand	CO 1	CLO 2	AEC011.02
8	Define antenna gain.	It is the ratio of the power required at the input of a loss-free reference	Remember	CO 1	CLO 2	AEC011.02

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		antenna to the power supplied to the input of the given antenna to produce, in a given direction, the same field strength at the same distance.				
9	Define half power beam width.	In a radio antenna pattern, the half power beam width is the angle between the half-power (-3 dB) points of the main lobe, when referenced to the peak effective radiated power of the main lobe.	Remember	CO 1	CLO 2	AEC011.02
10	Define Antenna Radiation Pattern.	It is defined as a mathematical function or a graphical representation of the radiation properties of the antenna as a function of space coordinates.	Remember	CO 1	CLO 3	AEC011.03
11	Define radiation lobe.	A radiation lobe is a portion of the radiation pattern bounded by regions of relatively weak radiation intensity.	Understand	CO 1	CLO 2	AEC011.02
12	Define Near Field.	The close-in region of an antenna where the angular field distribution is dependent upon the distance from the antenna.	Understand	CO 1	CLO 2	AEC011.02
13	Define Polarization.	It is defined as the orientation of the electric field of an electromagnetic wave.	Remember	CO 1	CLO 2	AEC011.02
14	Define Major lobe.	A major lobe (also called main beam) is defined as "the radiation lobe containing the direction of maximum radiation."	Remember	CO 1	CLO 1	AEC011.01
15	Define side lobe.	A side lobe is "a radiation lobe in any direction other than the intended lobe."	Remember	CO 1	CLO 1	AEC011.01
16	Define back lobe.	A back lobe is "a radiationlobe whose axis makes anangle of approximately 180◦ with respect to the beam of an antenna."	Remember	CO 1	CLO 2	AEC011.02
17	Define Antenna Beamwidth.	Beam width is the aperture angle from where most of the power is radiated. Beamwidth is the angular separationbetween two identical points on oppositesite of the pattern maximum	Remember	CO 1	CLO 1	AEC011.01
18	Define Antenna bandwidth.	A band of frequencies in a wavelength, specified for the particular communication, is known as bandwidth.	Remember	CO 1	CLO 2	AEC011.02
19	Define First-Null beamwidth	It is Angular separation between the first nulls of the pattern	Remember	CO 1	CLO 1	AEC011.01
20	Define Radiation intensity.	It is defined the power radiated from an antenna per unit solid angle in a given direction"	Remember	CO 1	CLO 1	AEC011.01
21	Define field pattern in linear scale.	field pattern(in linear scale) typically represents a plot of the magnitude of the electric or magnetic field as a function of the angular space.	Remember	CO 1	CLO 2	AEC011.02
22	Define power pattern in linear scale.	power pattern(in linear scale) typically represents a plot of the square of the magnitude of the	Remember	CO 1	CLO 1	AEC011.01

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		electric or magnetic field as a function of the angular space.				
23	Define power pattern in dB.	power pattern(in dB) represents the magnitude of the electric or magnetic field, in decibels, as a function of the angular space.	Remember	CO 1	CLO 1	AEC011.01
24	Define an omnidirectional antenna.	It is defined as one "having an essentially non directional pattern in a given plane (in this case in azimuth) and a directional pattern in any orthogonal plane (in this case in elevation)."	Remember	CO 1	CLO 1	AEC011.01
25	Define an isotropic radiator	A hypothetical lossless antenna having equal radiation in all directions.	Remember	CO 1	CLO 1	AEC011.01
26	Define directional antenna.	A directional antenna is one "having the property of radiating or receiving electromagnetic waves more effectively in some directions than in others	Remember	CO 1	CLO 2	AEC011.02
27	Define E-plane.	It is defined as "the plane containing the electric field vector and the direction of maximum radiation,"	Remember	CO 1	CLO 1	AEC011.01
28	Define H-plane.	It is defined as "the plane containing the magnetic-field vector and the direction of maximum radiation."	Remember	CO 1	CLO 1	AEC011.01
29	Define Reactive near-field region.	It is defined as "that portion of the near-field region immediately surrounding the antenna wherein the reactive field predominates."	Remember	CO 1	CLO 2	AEC011.02
30	Define Radiating near-field (Fresnel) region.	is defined as "that region of the field of an antenna between the reactive near-field region and the far-field region wherein radiation fields predominate and wherein the angular field distribution is dependent upon the distance from the antenna	Remember	CO 1	CLO 1	AEC011.01
31	Define Far-field (Fraunhofer) region	It is defined as "that region of the field of an antenna where the angular field distribution is essentially independent of the distance from the antenna.	Remember	CO 1	CLO 1	AEC011.01
32	Define One radian.	It is defined as the plane angle with its vertex at the center of a circle of radius r that is subtended by an arc whose length is r.	Remember	CO 1	CLO 1	AEC011.01
33	Define One steradian.	It is defined as the solid angle with its vertex at the center of a sphere of radius r that is subtended by a spherical surface area equal to that of a square with each side of length r.	Understand	CO 1	CLO 2	AEC011.02
34	Define radiation density.	It is defined as the average power radiated by an antenna.	Remember	CO 1	CLO 1	AEC011.01
35	Define beam solid angle (Ω_A).	It is defined as the solid angle through which all the power of the antenna would flow if its radiation intensity is constant for all angles within Ω_A.	Remember	CO 1	CLO 2	AEC011.02

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
36	Define beam efficiency.	It is defined as the ratio of power transmitted (received) within cone angle to the power transmitted (received) by the antenna.	Remember	CO 1	CLO 2	AEC011.02
37	Define Polarization of antenna.	It is defined as "the polarization of the wave transmitted (radiated) by the antenna in a given direction.	Remember	CO 1	CLO 3	AEC011.03
38	Define Polarization of a radiated wave.	It is defined as "that property of an electromagnetic wave describing the time-varying direction and relative magnitude of the electric-field vector;	Remember	CO 1	CLO 3	AEC011.03
39	Define antenna input impedance	It is defined as "the impedance presented by an antenna at its terminals or the ratio of the voltage to current at a pair of terminals or the ratio of the appropriate components of the electric to magnetic fields at a point."	Remember	CO 1	CLO 3	AEC011.03
40	Define conduction-dielectric efficiency e_{cd}.	is defined as the ratio of the power delivered to the radiation resistance R_r to the power delivered to R_r and R_L.	Remember	CO 1	CLO 1	AEC011.03
		UNIT-II				
1	Define array factor.	It is a function of the geometry of the array and the excitation phase. By varying the separation d and/or the phase β betweenthe elements, the characteristics of the array factor and of the total field of the array can be controlled.	Remember	CO 2	CLO 4	AEC011.04
2	Define array.	To enlarge the dimensions of the antenna, without necessarily increasing the size of the individual elements, is to form an assembly of radiating elements in an electrical and geometrical configuration. This new antenna, formed by multielements, is referred to as an array	Remember	CO 2	CLO 4	AEC011.04
3	What is triangular array?	A triangular array consisting of twelve dipoles, with four dipoles oneach side of the triangle.	Remember	CO 2	CLO 4	AEC011.04
4	Define sectoral array.	In the triangular array, each four-element array is on each side of the triangle, that is basically used to cover an angular sector of 120◦ forming what is usually referred to as a sectoral array.	Understand	CO 2	CLO 4	AEC011.04
5	Define pattern multiplication.	A uniform two-element array of identical elements is equal to the product of the field of a single element, at a selected reference point (usually the origin), and the array factor of that array is called pattern multiplication.	Understand	CO 2	CLO 4	AEC011.04
6	What is an uniform array?	An array of identical elements all of identical magnitude and each with a progressive phase is referred to as a uniform array	Remember	CO 2	CLO 4	AEC011.04

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
7	What is binominal array?	In the Pascal's triangle,the values of m(=1,2,3,4…….) are used to represent the number of elements of the array, then the coefficients of the expansion represent the relative amplitudes of the elements. Since the coefficients are determined from a binomial series expansion, the array is known as a binomial array.	Remember	CO 2	CLO 4	AEC011.04
8	Define the effective length.	It is defined as "the ratio of the magnitude of the open-circuit voltage developed at the terminals of the antenna to the magnitude of the electric-field strength in the direction of the antenna polarization in a given direction.	Remember	CO 2	CLO 4	AEC011.04
9	Define the loss area.	It is defined as the equivalent area, which when multiplied by the incident power density leads to the power dissipated as heat through R_L.	Understand	CO 2	CLO 4	AEC011.04
10	Define beam shaping.	The patterns exhibit a desired distribution in the entire visible region. This is referred to as beam shaping.	Remember	CO 2	CLO 5	AEC011.04
11	What is a broadside array?	It is a one or two dimensional array in which the direction of maximum radiation of the radio waves is perpendicular to the plane of the antennas. To radiate perpendicularly, the antennas must be fed in phase.	Remember	CO 2	CLO 5	AEC011.05
12	What is an endfire array?	It is a linear array in which the direction of radiation is along the line of the antennas. The antennas must be fed with a phase difference equal to the separation of adjacent antennas.	Remember	CO 2	CLO 5	AEC011.05
13	What is a driven array?	It is an array in which the individual component antennas are all "driven" connected to the transmitter or receiver.	Remember	CO 2	CLO 4	AEC011.04
14	What is a colinear array?	It is a broadside array consisting of multiple identical dipole antennas oriented vertically in a line.	Remember	CO 2	CLO 6	AEC011.06
15	What is a phased array?	It is a planar array in which the beam can be steered electronically to point in any direction over a wide angle in front of the array, without physically moving the antenna.	Remember	CO 2	CLO 5	AEC011.05
16	What is a conformal array?	It is a two-dimensional phased array which is not flat, but conforms to some curved surface. The individual elements are driven by phase shifters which compensate for the varying path lengths, allowing the antenna to radiate a plane wave beam.	Remember	CO 2	CLO 5	AEC011.05
17	What is an adaptive array?	a receiving array that estimates the direction of arrival of the radio waves and electronically optimizes the radiation pattern adaptively to receive	Remember	CO 2	CLO 5	AEC011.05

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		it, synthesizing a main lobe in that direction.				
18	What is a parasitic array?	This is an endfire array which consist of multiple antenna elements in a line of which only one, the driven element is connected to the transmitter or receiver, while the other elements, called parasitic elements.	Remember	CO 2	CLO 6	AEC011.06
19	What is a yagi uda antenna ?	It is the endfire array which consists of multiple half-wave dipole elements in a line. It consists of a single driven element with multiple "director" parasitic elements in the direction of radiation, and usually a single "reflector" parasitic element behind it.	Remember	CO 2	CLO 4	AEC011.04
20	What is a log periodic dipole array ?	It is an endfire array consisting of many dipole driven elements in a line, with gradually increasing length. It acts as a high gain broadband antenna.	Remember	CO 2	CLO 4	AEC011.04
21	What is a loop antenna?	It is a radio antenna consisting of a loop or coil of wire, tubing, or other electrical conductor usually fed by a balanced source or feeding a balanced load.	Remember	CO 2	CLO 4	AEC011.04
22	Define small loop.	Small loops are “small” in comparison to their operating wavelength, typically between 5% and 30% of a wavelength in circumference, with transmitting loops tending to be closer to 30%.	Remember	CO 2	CLO 4	AEC011.04
23	Define magnetic loop.	A small transmitting loop antenna, also known as a magnetic loop, with a circumference 10% of a wavelength or less, will have a relatively constant current distribution along the conductor, and the main lobe will be in the plane of the loop.	Remember	CO 2	CLO 4	AEC011.04
24	What is the operating frequency of small loop?	Small loops are used in land mobile radio (mostly military) at frequencies between 3–7 MHz, because of their ability to direct energy upwards.	Remember	CO 2	CLO 4	AEC011.04
25	Define radio direction finder.	It is usually a loop antenna, rotates and pinpoints the direction from which a radio signal is strongest.	Remember	CO 2	CLO 4	AEC011.04
26	What is a helical antenna?	It is an antenna consisting of one or more conducting wires (monofilar, bifilar, or quadrifilar with 1, 2, or 4 wires respectively) wound in the form of a helix.	Remember	CO 2	CLO 6	AEC011.06
27	What is an axial mode in helical antenna?	When the helix circumference is approximately equal to wavelength, this is referred as axial mode.	Remember	CO 2	CLO 6	AEC011.06
28	Define normal mode helix.	When the circumference of the helix is significantly less than a wavelength and its pitch (axial distance between successive turns) is significantly less than a quarter wavelength, the antenna is called a normal-	Remember	CO 2	CLO 6	AEC011.06

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		mode helix.				
29	What is the use of circular polarisation in helical antennas?	In radio transmission, circular polarisation is often used where the relative orientation of the transmitting and receiving antennas cannot be easily controlled, such as in animal tracking and spacecraft communications or where the polarisation of the signal may change, so end-fire helical antennas are frequently used for these applications.	Remember	CO 2	CLO 6	AEC011.06
30	What is the terminal impedance of axial helix?	$Z=140(C/\lambda)$	Remember	CO 2	CLO 6	AEC011.06
31	Define axial mode helical antenna.	The most popular helical antenna (helix) is a travelling wave antenna in the shape of a corkscrew that produces radiation along the axis of the helix antenna. These helix antennas are referred to as axial-mode helical antenna.	Remember	CO 2	CLO 6	AEC011.06
32	What are the benefits of helical antenna?	The benefits of the helical antenna are,has a wide bandwidth, is easily constructed, has a real input impedance, and can produce circularly polarized fields.	Remember	CO 2	CLO 6	AEC011.06
33	What is a folded dipole?	It is a dipole antenna with the ends folded back around and connected to each other, forming a loop.	Remember	CO 2	CLO 5	AEC011.05
34	What are the applications of yagi antenna?	A Yagi antenna is used for point to point communications in a medium range of 3 to 5 miles between two points. It can also be used as a bridge antenna to connect clients to an access point.	Remember	CO 2	CLO 5	AEC011.05
35	What is the main reason for using folded dipole antenna?	One of the main reasons for using a folded dipole antenna is the increase in feed impedance that it provides. If the conductors in the main dipole and the second or "fold" conductor are the same diameter	Remember	CO 2	CLO 5	AEC011.05
UNIT-III						
1	Define the range of VHF.	Very high frequency (VHF) is the ITU designation for the range of radio frequency electromagnetic waves (radio waves) from 30 to 300 megahertz (MHz).	Remember	CO 3	CLO 6	AEC011.06
2	Define the range of UHF	Ultra high frequency (UHF) is the ITU designation for radio frequencies in the range between 300 megahertz (MHz) and 3 gigahertz (GHz).	Remember	CO 3	CLO 6	AEC011.06
3	List different antennas used in VHF and UHF .	Typical antennas most widely used in VHF and UHF are Yagi-uda,folded dipole, ground plane corner reflector.	Understand	CO 3	CLO 6	AEC011.06
4	Define the range of Microwaves	Microwaves are a form of electromagnetic radiation with wavelengths ranging from about one	Remember	CO 3	CLO 6	AEC011.06

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		meter to one millimeter; with frequencies between 300 MHz (1 m) and 300 GHz (1 mm)				
5	Define VHF antennas	The antennas which are operated between the frequency range 30 to 300MHZ is called VHF antennas.	Remember	CO 3	CLO 6	AEC011.06
6	Define UHF antennas	The antennas which are operated between the frequency range 300 to 3000MHZ is called VHF antennas.	Remember	CO 3	CLO 6	AEC011.06
7	Define Microwaves antennas	The antennas which are operated above the frequency range 3000MHZ is called microwave antennas.	Understand	CO 3	CLO 6	AEC011.06
8	Define Fermat's principle	Fermat's principle or the principle of least time, , is the principle thatthe path taken between two points by a ray of light is the path that can be traversed in the least time.	Remember	CO 3	CLO 8	AEC011.08
9	Define horn antenna	A horn antenna or microwave horn is an antenna that consists of a flaring metal waveguide shaped like a horn to direct radio waves in a beam.	Understand	CO 3	CLO 7	AEC011.07
10	What are the types of horn antennas?	Basically horn antennas are classified as rectangular and cicular,depending upon the direction of flaring rectangular horns are further classified as sectoral and pyramidal	Understand	CO 3	CLO 7	AEC011.07
11	Define optimum aperture angle	In optics, an aperture is a hole or an opening through which light travels. More specifically, the aperture and focal length of an optical system determine the cone angle of a bundle of rays that come to a focus in the image plane.	Remember	CO 3	CLO 7	AEC011.07
12	What are the applications of horn antennas.	Horn antennas are used at microwave frequencies where moderate gains are required, they used as feed elements.	Remember	CO 3	CLO 7	AEC011.07
13	Define principle of lens antenna	The principle of least time, , is the principle thatthe path taken between two points by a ray of light is the path that can be traversed in the least time.	Remember	CO 3	CLO 8	AEC011.08
14	Define lens antennas	Lens antennas are microwave antennas constructed with single or multiple lenses. Lens antennas are typically designed using geometrical optics, physical optics or full-wave analysis.	Understand	CO 3	CLO 8	AEC011.08
15	List different lense antennas	i)Di-electric lens or H-plane metal plate lens or Delay lens (Travelling waves are delayed by lens media) ii)E-plane metal plate lens. iii)Non-metallic di-electric type lens. iv)Metallic or artificial dielectric type of lens.	Remember	CO 3	CLO 8	AEC011.08

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
16	What are the advantages of lense antennas.	The main advantage of lens antenna is that feed antennas in the design do not obstruct the aperture.	Understand	CO 3	CLO 8	AEC011.08
17	Define zoning in lense antennas	The weight of the lense can be reduced by removing sections of lense, which is called zoning of lense.	Remember	CO 3	CLO 8	AEC011.08
18	List out the applications of lense antennas	Used as wide band antenna and used for microwave transmission and reception.	Remember	CO 3	CLO 8	AEC011.08
19	List out applications of micro strip antennas	satellite communication, In telemedicine application, micro strip antennas operate at 2.45 GHz. Wearable micro strip antennas are suitable for wireless body area network	Remember	CO 3	CLO 9	AEC011.09
20	What are feeding methods of microstrip antenna	There are 2 important methods to feed micro strip antennas (i) Contacting feed (ii) non-contacting feed.	Understand	CO 3	CLO 9	AEC011.09
21	Define plane reflector	Plane reflector is the simplest form of reflector antenna. In this feed is placed in front of the reflector.	Understand	CO 3	CLO 9	AEC011.09
22	Define slot antenna	Slot radiators or slot antennas are antennas that are used in the frequency range from about 300 MHz to 25 GHz. They are often used in navigation radar.	Understand	CO 3	CLO 10	AEC011.10
23	Define Babinet's Principle	The field at any point behind a plane having screen, if added to the field at the same point when the complementary field is substituted, is the same as the field at the point where there is no screen.	Understand	CO 3	CLO 8	AEC011.08
24	What are the advantages of slot antennas	A slot antenna's main advantages are its size, design simplicity, and convenient adaptation to mass production using either waveguide or PC board technology	Understand	CO 3	CLO 8	AEC011.08
25	What are the disadvantages of slot antennas	Waveguide slot antennas are heavy compared to their dipole equivalents	Understand	CO 3	CLO 8	AEC011.08
26	Define annular slot antenna	An inexpensive, efficient, broadband, slot-type antenna with unidirectional sensitivity includes a slot.	Understand	CO 3	CLO 8	AEC011.08
27	Define the parameters that effect the impedance of slot antenna	Intrinsic impedance of surrounding medium, impedance of complementary dipole antenna	Understand	CO 3	CLO 9	AEC011.09
28	What are the other names of microstrip antenna	Patch antenna or printed antenna or micro strip patch antenna.	Understand	CO 3	CLO 9	AEC011.09
29	Define the features of micro strip	A Micro strip Antenna in its simplest form consists of a radiating patch on	Understand	CO 3	CLO 9	AEC011.09

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	antennas	one side of Dielectric substrate and a ground plane on the other side. Most common shapes are rectangular and circular.				
30	List out advantages of micro strip antennas	1. Light weight and low volume 2. Planar configuration 3. Low manufacturing cost 4. Support both linear as well as circular polarization 5. Easily integrated with microwave integrated circuit 6. Capable of multiband operation 7. Mechanically robust when mounted on rigid surface	Understand	CO 3	CLO 9	AEC011.09
31	List out limitations of micro strip antennas	Narrow bandwidth, low gain and surface wave losses.	Understand	CO 3	CLO 9	AEC011.09
32	Define rectangular patch antenna.	A patch antenna is a type of radio antenna with a low profile, which can be mounted on a flat surface. It consists of a flat rectangular sheet or "patch" of metal, mounted over a larger sheet of metal called a ground plane.	Understand	CO 3	CLO 9	AEC011.09
33	What are the characteristics of micro strip antennas?	A Micro strip Antenna in its simplest form consists of a radiating patch on one side of Dielectric substrate and a ground plane on the other side. Most common shapes are rectangular and circular.	Understand	CO 3	CLO 9	AEC011.09
34	What are the disadvantages of micro strip antennas	➨It offers lower gain. ➨It has higher level of cross polarization radiation. ➨It has lower power handling capability. ➨It has inherently lower impedance bandwidth. ➨It offers low efficiency due to dielectric losses and conductor losses.	Understand	CO 3	CLO 9	AEC011.09
		UNIT-IV				
1	what are types of reflector antennas	Common reflectors antennas are: cylindrical, corner, and spherical.	Remember	CO 4	CLO 10	AEC011.10
2	What is the angle between two flat sheets in flat reflector antenna	The angle at which two plane reflectors are joined is called included angle.	Remember	CO 4	CLO 10	AEC011.10
3	Define flat sheet reflector	Flat sheet reflector is defined as the simplest reflector antenna in which the plane reflector is kept infront of the feed and the energy is radiated in the desired directions.	Remember	CO 4	CLO 10	AEC011.10

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
4	Define corner reflector antenna	A corner reflector antenna is defined as a type of directional antenna used at VHF and UHF frequencies. It consists of a dipole driven element mounted in front of two flat rectangular reflecting screens joined at an angle, usually 90°.	Remember	CO 4	CLO 10	AEC011.10
5	Define paraboloidal reflector	A parabolic antenna is an antenna that uses a parabolic reflector, a curved surface with the cross-sectional shape of a parabola, to direct the radio waves. The most common form is shaped like a dish and is popularly called a dish antenna or parabolic dish.	Remember	CO 4	CLO 10	AEC011.10
6	What is the advantage of plane reflector	The main advantage of the plane reflector is that for the dipole backward radiations are reduced and gain in the forward direction increases.	Remember	CO 4	CLO 10	AEC011.10
7	What is the disadvantage of plane reflector	The main disadvantage of the plane reflector is that there is radiation in back and side directions.	Remember	CO 4	CLO 10	AEC011.10
8	Define included angle	The angle at which two plane reflectors are joined is called included angle	Remember	CO 4	CLO 10	AEC011.10
9	Define square corner reflector.	When the corner angle or include angle is 90degrees,the corner reflector is called square corner reflector.	Remember	CO 4	CLO 10	AEC011.10
10	How spillover is formed?	Some of the rays are not fully captured by reflector, such non-captured rays form spill over.	Remember	CO 4	CLO 10	AEC011.10
11	Define back lobe	The side lobe in the opposite direction from the main lobe is called the "back lobe".	Remember	CO 4	CLO 10	AEC011.10
12	Define paraboloid	The three dimensional structure of the parabolic reflector can be obtained by rotating the parabola around its axis and is called paraboloid.	Remember	CO 4	CLO 10	AEC011.10
13	What are feed systems of parabolid reflector	Dipole with plane reflector, end fire array of dipole, horn with waveguide.	Remember	CO 4	CLO 10	AEC011.10
14	What are the applications of plane reflector?	The most important applications of reflector ant ennas are in radar, space communications, radio astronomy and wireless communications.	Remember	CO 4	CLO 10	AEC011.10
15	What are the applications of corner reflector	Corner reflector antennas are widely used for UHF television receiving antennas, point-to-point communication links and data links for wireless WANs, and amateur radio antennas on the 144, 420, and 1296 MHz bands.	Remember	CO 4	CLO 10	AEC011.10

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
16	What are the advantages of corner reflector	Its simplicity of design and construction make it attractive.	Remember	CO 4	CLO 11	AEC011.11
17	What are the applications of slot antennas	Slot antennas are most extensively used in high speed air-crafts.	Remember	CO 4	CLO 10	AEC011.10
18	What are the applications of paraboloidal reflector	The most common modern applications of the parabolic reflector are in satellite dishes, reflecting telescopes, radio telescopes, parabolic microphones, solar cookers, and many lighting devices such as spotlights, car headlights, PAR lamps and LED housings.	Remember	CO 4	CLO 10	AEC011.10
19	What are the advantages of paraboloidal reflector	Parabolic reflector antennas are able to provide very high levels of gain. The larger the 'dish' in terms of wavelengths, the higher the gain.	Understand	CO 4	CLO 11	AEC011.11
20	What are the disadvantages of paraboloidal reflector	➨The design of parabolic reflector is a complex process. ➨Inspire of feed horn at focus and uniform illumination, certain amount of power from feed is bound to slop over the edges of parabolic reflector. This power is responsible to form side lobes in the radiation pattern. ➨Surface distortions can occur in very large dish. ➨In order to achieve best performance results, feed should be placed exactly at the focus of the parabolic reflector antenna. This is difficult to achieve practically.	Understand	CO 4	CLO 10	AEC007.10
21	Define important measurement parameters of antenna	Gain, directivity, radiation pattern etc are important measurement parameters of antenna.	Remember	CO 4	CLO 12	AEC011.12
22	Define three main regions of the radiated field of the antenna	Three main regions of radiated field of antenna are reactive nearfield region, radiating near field region, far field region.	Remember	CO 4	CLO 12	AEC011.12
23	Give other name of reactive near field region	Reactive near field region is also called as radian sphere.	Remember	CO 4	CLO 12	AEC011.12
24	Give other name of radiating near field region	Radiating near field region is also called as Fresnel region.	Remember	CO 4	CLO 12	AEC011.12
25	Give other name of radiating far field region	Far field region is also called as Fraunhofer region.	Remember	CO 4	CLO 12	AEC011.12
26	Which coordinate system is best suited for antenna measurement	Spherical coordinate system is best suited for antenna measurement	Remember	CO 4	CLO 12	AEC011.12

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
27	Define different sources of antenna measurements.	(a)Errors due to finite measurement distance between antennas. (b)Reflections from surroundings (c)Errors due to coupling in the reactive near field (d)Errors due to atmospheric effects.	Remember	CO 4	CLO 12	AEC011.12
28	Define different methods to overcome drawbacks in antenna measurements.	(a)The measurements are made using scale model. (b)The automated measuring instruments are used. (c)The computer techniques are along with the advanced automated measuring equipments.	Remember	CO 4	CLO 12	AEC011.12
29	What is the need of antenna measurements	For exploring the performance of the antenna, the important parameters of the antenna must be measured.	Remember	CO 4	CLO 12	AEC011.12
30	Define the significance of reciprocal relationship between transmitting and receiving modes.	The transmitting and receiving patterns of antenna are same; the power flow is same in transmitting and receiving mode.	Remember	CO 4	CLO 12	AEC011.12
31	Define reflection ranges	A reflection range makes use of a constructive interference between the direct radiation from the antenna and the specular reflection from the ground.	Remember	CO 4	CLO 12	AEC011.12
32	Define indoor ranges	The indoor ranges makes use of microwave	Remember	CO 4	CLO 12	AEC011.12
		UNIT-V				
1	Define linear polarization	If the polarization vector remains constant throughout the polarization, then it is called Linear polarization.	Understand	CO 5	CLO 13	AEC011.13
2	Define Horizontal polarization	If the electric field propagates in the direction parallel to the earth's surface then it is called Horizontal polarization.	Understand	CO 5	CLO 13	AEC011.13
3	Define Vertical polarization	If the electric field propagates in the direction perpendicular to the earth's surface then it is called Horizontal polarization.	Remember	CO 5	CLO 13	AEC011.13
4	Define Circular polarization	If the polarization vector rotates through 360° as the EM wave travels distance equal to one wavelength through free space with equal field strength at all angles of polarization.	Remember	CO 5	CLO 13	AEC011.13
5	Define wave front	A wave front is nothing but a surface of constant phase of a wave.	Understand	CO 5	CLO 13	AEC011.13
6	Define guided waves	These are the waves guided by manmade structures like parallel wire or coaxial transmission lines, optical fibers, waveguides etc,	Remember	CO 5	CLO 13	AEC011.13
7	Define unguided waves	These are the wave's propagation in the terrestrial atmosphere, along earth	Remember	CO 5	CLO 13	AEC011.13

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		or in outer space.				
8	Define ground wave or surface wave propagation	The ground wave is guided along the surface of the earth which is very much similar to the electromagnetic waves guided through waveguide or transmission line.	Understand	CO 5	CLO 13	AEC011.13
9	Define sky wave or ionospheric wave propagation	Sky Wave (Skip/ Hop/ Ionospheric Wave) is the propagation of radio waves bent (refracted) back to the Earth's surface by the ionosphere.	Understand	CO 5	CLO 13	AEC011.13
10	Define space wave propagation	These waves travel directly from an antenna to another without reflection on the ground.	Understand	CO 5	CLO 13	AEC011.13
11	Define wave tilt	Wave tilt is defined as the change of orientation of the vertically polarized ground wave at the surface of the earth.	Understand	CO 5	CLO 14	AEC011.14
12	Define Radio horizon	The locus of points at distance at which direct rays become tangential to the surface is called Radio horizon.	Remember	CO 5	CLO 14	AEC011.14
13	Define tropospheric propagation	The tropospheric propagation is nothing but the propagation of VHF, UHF and microwave signals beyond the horizon.	Understand	CO 5	CLO 14	AEC011.14
14	Define trapped wave	A surface wave which carries the energy in wave with in a small distance from the interface is called trapped wave.	Understand	CO 5	CLO 14	AEC011.14
15	Define tropospheric waves	The waves which are reflected or scattered in the troposphere before reaching to the receiving antenna are called tropospheric waves	Understand	CO 5	CLO 14	AEC011.14
16	Define ionospheric waves	The sky waves resulting due to the scattering in the ionosphere are also known as ionospherically reflected waves.	Understand	CO 5	CLO 14	AEC011.14
17	Define LOS	It is defined that is covered by a direct space wave from the transmitting antenna to the receiving antenna.	Remember	CO 5	CLO 14	AEC011.14
18	Define Ionisation	Ionisation is a process by which a neutral atom or molecule gains or losses electrons and is left with a net charge.	Understand	CO 5	CLO 14	AEC011.14
19	Define refractive index of ionosphere	Refractive index of ionosphere is defined as the ratio of phase velocity of a wave in vacuum to the velocity in the ionosphere.	Understand	CO 5	CLO 14	AEC011.14
20	Define critical frequency f_c	f_c for a given layer is defined as the highest frequency that will be reflected to earth by that layer at vertical incidence.	Remember	CO 5	CLO 13	AEC011.15
21	Define virtual height	It is defined as the height that is reached by a short pulse of energy which has the same time delay as the original wave.	Remember	CO 5	CLO 14	AEC011.14
22	Define maximum usable frequency (MUF)	It is the highest frequency of wave that is reflected by the layer at an angle of incidence other than normal.	Remember	CO 5	CLO 14	AEC011.14

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
23	Define skip distance	It is defined as the shortest distance from the transmitter that is covered by a fixed frequency	Understand	CO 5	CLO 14	AEC011.14
24	What is lowest usable frequency (LUF)	The lowest frequency that can be used for communication is called LUF.	Understand	CO 5	CLO 14	AEC011.14
25	Define critical angle	Critical angle is defined as the angle of incidence of a wave at which the wave will not be reflected when $\theta > \theta_c$ and it will be reflected when $\theta < \theta_c$	Understand	CO 5	CLO 14	AEC011.14
26	Define optimum working frequency (OWF)	The frequency of wave which is normally used for ionospheric communication is known as optimum working frequency	Understand	CO 5	CLO 15	AEC011.15
27	What is fading	Fading is the change in signal strength at the receiver	Remember	CO 5	CLO 15	AEC011.15
28	Define Antenna or Space diversity	If the antenna elements of the receiver are separated by a fraction of the transmitted wavelength, then the various copies of the information signal or generically termed as branches, can be combined suitably or the strongest of them can be chosen as the received signal. Such a diversity technique is termed as Antenna or Space diversity.	Understand	CO 5	CLO 15	AEC011.15
29	Define Frequency Diversity	The same information signal is transmitted on different carriers, the frequency separation between them being at least the coherence bandwidth.	Understand	CO 5	CLO 15	AEC011.15
30	Define Time Diversity	The information signal is transmitted repeatedly in time at regularly intervals. The separation between the transmit times should be greater than the coherence time, T_c. The time interval depends on the fading rate, and increases with the decrease in the rate of fading.	Understand	CO 5	CLO 15	AEC011.15
31	What is duct propagation	The propagation utilizing the super refraction is called duct propagation.	Understand	CO 5	CLO 15	AEC011.15
32	What is super refraction	An abnormally rapid decrease in the refractive index with height in the atmosphere, leading to anomalous propagation of radio waves, generally marked by an increase in their range.	Understand	CO 5	CLO 15	AEC011.15
33	Define refraction	The bending of waves that occurs when they pass through a medium (air or ionosphere) produce variation in the velocity of waves.	Understand	CO 5	CLO 15	AEC011.15
34	Define Skip Zone	It is defined as the region between the furthest transmission points and the nearest point refracted waves can be received.	Understand	CO 5	CLO 15	AEC011.15
35	What is the D-region height	Height range of 50 km to 90 km.	Remember	CO 5	CLO 15	AEC011.15
36	What is the F-region height	Height- 140 km to 400 km from earth surface.	Remember	CO 5	CLO 15	AEC011.15

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
37	Define Gyro frequency	Gyro frequency is defined as the frequency whose period is equal to the revolution of an electron in its circular orbit under the influence of the earth's magnetic field of the flux B.	Understand	CO 5	CLO 15	AEC011.15
38	Define multi-hop propagation	The coverage of transmission distance between transmitter and receiver in more than one hop is called multi-hop propagation.	Understand	CO 5	CLO 15	AEC011.15
39	What is Pseudo-Brewster angle	The magnitude reaches a minimum and the phase goes through -90 degree at an angle known as Pseudo-Brewster angle.	Remember	CO 5	CLO 15	AEC011.15
40	Define Diffraction	Due to its high frequency signal bends around the edge of the object and tends to make the borders of it lighter.	Understand	CO 5	CLO 15	AEC011.15

Signature of the Faculty
Dr. V .Sivanagaraju, Professor

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