



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

ELECTRONICS AND COMMUNICATION ENGINEERING

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	SATELLITE COMMUNICATION
Course Code	:	AEC522
Program	:	B.Tech
Semester	:	VI
Branch	:	Electronics and Communication Engineering
Section	:	C
Course Faculty	:	Dr. V Sivanagaraju, Professor, ECE

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 a Satellite?	An artificial body that is projected from earth to orbit either earth (or) another body of solar systems. Types: Information satellites and Communication Satellites	Understand	CO 1	CLO 1	AEC522.01
2	Define Satellite Communication.	It is defined as the use of orbiting satellites to receive, amplify and retransmit data to earth stations.	Understand	CO 1	CLO 1	AEC522.01
3	State Kepler's first law.	It states that the orbit of any smaller body about a larger body is always an ellipse, with the center of mass of the larger body as one of the two foci.	Remember	CO 1	CLO 1	AEC522.01
4	State Kepler's second law.	It states that the orbit of the smaller body sweeps out equal areas in equal time.	Remember	CO 1	CLO 1	AEC522.01
5	State Kepler's third law.	It states that the square of the period of revolution of the smaller body equals a constant multiplied by the third power of the semi major axis of the orbital ellipse.	Remember	CO 1	CLO 1	AEC522.01
6	Define apogee.	The point farthest from the earth.	Understand	CO 1	CLO 1	AEC522.01
7	Define Perigee.	The point closest from the earth.	Understand	CO 1	CLO 1	AEC522.01
8	Define ascending node.	The point where the orbit crosses the equatorial plane going from south to north.	Remember	CO 1	CLO 1	AEC522.01
9	Define descending node.	The point where the orbit crosses the equatorial plane going from north to south.	Remember	CO 1	CLO 1	AEC522.01

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
10	What is sun transit outage.	The sun transit is nothing but the sun comes within the beam width of the earth station antenna. During this period the sun behaves like an extremely noisy source and it blanks out all the signal from the satellite. This effect is termed as sun transit outage.	Understand	CO 1	CLO 1	AEC522.01
11	What is meant by azimuth angle?	It is defined as the angle produced by intersection of local horizontal plane and the plane passing through the earth station, the satellite and center of earth.	Understand	CO 1	CLO 2	AEC522.02
12	Give the types of satellite services.	Fixed satellite service, Broadcasting satellite service, Mobile satellite service, Navigational satellite services, Meteorological satellite services	Remember	CO 1	CLO 2	AEC522.02
13	What is meant by Dom sat?	Domestic Satellites. These are used for voice, data and video transmissions within the country.	Understand	CO 1	CLO 2	AEC522.02
14	Define polar-orbiting satellites.	Polar orbiting satellites orbit the earth in such a way as to cover the north and south polar regions.	Understand	CO 1	CLO 2	AEC522.02
15	Define look angles.	The azimuth and elevation angles of the ground station antenna are termed as look angles.	Understand	CO 1	CLO 2	AEC522.02
UNIT-II						
1	Give the two segments of basic satellite communication.	Earth segment (or) ground segment, Space segment.	Understand	CO 2	CLO 3	AEC522.03
2	Define attitude control system.	It is the system that achieves and maintains the required attitudes. The main functions of attitude control system include maintaining accurate satellite position throughout the life span of the system.	Understand	CO 2	CLO 3	AEC522.03
3	What is declination?	The angle of tilt is often referred to as the declination which must not be confused with the magnetic declination used in correcting compass readings.	Remember	CO 2	CLO 3	AEC522.03
4	What is meant by payload?	It refers to the equipment used to provide the service for which the satellite has been launched.	Understand	CO 2	CLO 3	AEC522.03
5	What is meant by transponder?	In a communication satellite, the equipment which provides the connecting link between the satellite's transmit and receive antennas is referred to as the transponder.	Understand	CO 2	CLO 3	AEC522.03
6	Define the term station keeping.	It is the process of maintenance of satellite's attitude against different factors that can cause drift with time. Satellites need to have their orbits adjusted from time to time, because the satellite is initially placed in the correct orbit, natural forces induce a progressive drift.	Remember	CO 2	CLO 3	AEC522.03
7	What is meant by propellant?	A solid or liquid substance burnt in a rocket for the purpose of producing thrust.	Understand	CO 2	CLO 6	AEC522.06

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
8	Define spot beam antenna?	A beam generated by a communication satellite antenna of sufficient size that the angular spread of sufficient size that the angular spread of the energy in the beam is very small with the result that a region that is only a few hundred km in diameter is illuminated on earth.	Understand	CO 2	CLO 6	AEC522.06
9	What is an intermodulation noise?	Intermodulation distortion in high power amplifier can result in signal product which appear as noise and it is referred to as intermodulation noise.	Remember	CO 2	CLO 4	AEC522.04
10	What is an antenna loss?	It is added to noise received as radiation and the total antenna noise temperature is the sum of the equivalent noise temperature of all these sources	Understand	CO 2	CLO 4	AEC522.04
11	What is TWTA?	TWTA means Traveling Wave Tube Amplifier. The TWTA is widely used in transponder to provide the final output power required to the trans tube and its power supplies.	Understand	CO 2	CLO 5	AEC522.05
12	Define C/N ratio.	It is carrier to noise ratio is defined as the ratio of the received modulated carrier signal power C to the received noise power N after the receiver filters	Understand	CO 2	CLO 5	AEC522.05
13	Define noise factor.	An alternative way of representing amplifier noise is by means of its noise factor. In defining the noise factor of an amplifiers, usually taken as 290 k.	Understand	CO 2	CLO 5	AEC522.05
14	Define S/N ratio.	The S/N introduced in the preceding section is used to refer to the ratio of signal power to noise power at the receiver output. This is known as S/N ratio.	Understand	CO 2	CLO 5	AEC522.05
15	Define Inclination.	The angle between the orbital plane and the earth's equatorial plane. It is measured at the ascending node from the equator to the orbit going from east to north.	Remember	CO 2	CLO 6	AEC522.06
UNIT-III						
1	What is a single mode of operation?	A transponder channel aboard a satellite may be fully loaded by a single transmission from an earth station. This is referred to as a single access mode of operation.	Remember	CO 3	CLO 7	AEC522.07
2	What is preamble?	Certain time slots at the beginning of each burst are used to carry timing and synchronizing information. These time slots collectively are referred to as preamble.	Understand	CO 3	CLO 7	AEC522.07
3	Define guard time.	It is necessary to prevent the bursts from overlapping. The guard time will vary from burst to burst depending on the accuracy with which the various bursts can be positioned within each frame.	Remember	CO 3	CLO 7	AEC522.07
4	Define frame efficiency.	It is measure of the fraction of frame time used for the transmission of traffic.	Remember	CO 3	CLO 8	AEC522.08
5	Define satellite switched TDMA?	Space Division Multiplexing can be realized by switching the antenna	Understand	CO 3	CLO 8	AEC522.08

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		interconnections in synchronism with the TDMA frame rate, this being known as satellite switched TDMA.				
6	Define processing gain?	The processing gain is ratio of the spread bandwidth to the unspread bandwidth. It is usually expressed in decibels.	Remember	CO 3	CLO 8	AEC522.08
7	Define single access?	A transponder channel aboard a satellite may be fully loaded by a single transmission from earth station.	Understand	CO 3	CLO 8	AEC522.08
8	Define burst code word?	It is a binary word, a copy of which is stored at each earth station.	Understand	CO 3	CLO 8	AEC522.08
9	Define multiple access technique?	A transponder to be loaded by a number of carriers. These may originate from a number of earth station may transmit one or more of the carriers. This mode of operation known as multiple access technique.	Understand	CO 3	CLO 8	AEC522.08
10	Define frequency reuse?	The satellite as a whole to be accessed by earth stations widely separated geographically but transmitting on the same frequency that is known as frequency reuse.	Understand	CO 3	CLO 8	AEC522.08
11	What is a TDMA?	TDMA – Time Division Multiple Access Techniques Only one carrier uses the transponder at any one time, and therefore Inter modulation products, which results from the non-linear amplification of multiple carriers are absent.	Understand	CO 3	CLO 9	AEC522.09
12	Define space division multiple access?	The satellite as a whole to be accessed by earth stations widely separated geographically but transmitting on the same frequency that is known as frequency reuse. This method of access known as space division multiple access.	Remember	CO 3	CLO 9	AEC522.09
13	Define about pre-assigned TDMA satellite access.	Example for pre-assigned TDMA is CSC for the SPADE network. CSC can accommodate upto 49 earth stations in the network and 1 reference station. All bursts are of equal length. Each burst contains 128 bits. The bit rate is 128 Kb / s.	Remember	CO 3	CLO 9	AEC522.09
14	Define demand assigned TDMA satellite access.	The burst length may be kept constant and the number of bursts per frame used by the given station is varied when the demand is varied.	Understand	CO 3	CLO 9	AEC522.09
15	Define CDMA.	CDMA – Code Division Multiple Access Techniques In this method, each signal is associated with a particular code that is used to spread the signal in frequency and time.	Understand	CO 3	CLO 9	AEC522.09
UNIT-IV						
1	Define earth segment.	Earth segment of a satellite communication system consists of transmit earth station and receive earth station.	Understand	CO 4	CLO 10	AEC522.10

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
2	What is an EIRP?	EIRP means Equivalent Isotropic Radiated Power. It is a measure of radiated or transmitted power of an antenna.	Understand	CO 4	CLO 10	AEC522.10
3	Define Saturation flux density.	The flux density required at the receiving antenna to produce saturation of TWTA is termed the saturation flux density.	Remember	CO 4	CLO 10	AEC522.10
4	Define VSAT.	Very Small Aperture Terminal.	Understand	CO 4	CLO 10	AEC522.10
5	Define a Satellite Terminal?	A very small aperture terminal (VSAT) is a two-way satellite ground station with a dish antenna that is smaller than 3 meters. The majority of VSAT antennas range from 75 cm to 1.2 m. Data rates range from 4 kbit/s up to 16 Mbit/s.	Understand	CO 4	CLO 10	AEC522.10
6	What are VSAT applications?	VSATs are used to transmit narrowband data (e.g., point-of-sale transactions using credit cards, polling or RFID data, or SCADA), or broadband data (for the provision of satellite Internet access to remote locations, VoIP or video).	Apply	CO 4	CLO 10	AEC522.10
7	Define VSAT Antenna?	A VSAT earth terminal is characterized by a much smaller antenna, typically less than 2m in diameter. Consequently, the unit cost is appreciably lower than that of the hub. The VSAT has both lower antenna gain and lower transmit power than a hub, with the power normally generated by semi-conductor devices of the type.	Understand	CO 4	CLO 10	AEC522.10
8	What VSAT system Consists?	VSAT system consists of satellite, hub and small earth stations. Hub is built near to the headquarters, has the function of main control. The antenna diameter and power is bigger than small station.	Understand	CO 4	CLO 10	AEC522.10
9	What are the features of VSAT?	VSAT has the features of small antenna, compact structure, fully solid, low power consumption, low cost, low environment requirements, easy installation, wide cover range, flexible networking and independence. These features are suitable for requirements for many big enterprises and communication departments.	Understand	CO 4	CLO 10	AEC522.10
10	Define NGSO.	Non Geo Stationary Orbit	Understand	CO 4	CLO 11	AEC522.11
11	Define GPS.	Global Positioning System is a satellite based navigation system	Understand	CO 4	CLO 11	AEC522.11
12	What are the key features that affect the medium access control in satellite communication?	Long round-trip propagation delay, Inherently broadcast media, Lower privacy and security, Cost of communication is independent of distance.	Understand	CO 4	CLO 12	AEC522.12
13	Define footprint.	Signals from a satellite are normally aimed at a specific area called the footprint.	Understand	CO 4	CLO 12	AEC522.12

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
14	Define delay.	Delay means the time it takes for a message to be transferred from the user terminal to the host computer	Understand	CO 4	CLO 12	AEC522.12
15	Define throughput.	Throughput is the speed of information delivery (bits/sec)	Understand	CO 4	CLO 12	AEC522.12
UNIT-V						
1	Define INMARSAT.	It stands for International Marine Satellite Organization. It was founded in the year 1979. It provides voice and data service. It is used in marine assessment for disaster management.	Remember	CO 5	CLO 13	AEC522.13
2	Define aloha.	Aloha refers to a simple communications scheme in which each source (transmitter) in a network sends data whenever there is a frame to send. If the frame successfully reaches the destination (receiver), the next frame is sent. If the frame fails to be received at the destination, it is sent again.	Understand	CO 5	CLO 13	AEC522.13
3	Define m/g/1 queue.	A queue represented by a M/G/1 queue is a stochastic process whose state space is the set {0, 1, 2, 3...}, where the value corresponds to the number of customers in the queue, including any being served.	Understand	CO 5	CLO 13	AEC522.13
4	Define slotted aloha.	The Pure Aloha implemented with a slotted channel variation is known as the slotted Aloha protocol. For the slotted Aloha variant, all packets are of equal length and time is slotted.	Understand	CO 5	CLO 13	AEC522.13
5	Define tree algorithm.	This is a collision resolution protocol (CRP). As opposed to the instability of the ALOHA protocol, the efforts of CRP are concentrated on resolving collisions as soon as they occur	Understand	CO 5	CLO 13	AEC522.13
6	Define an error detecting code?	A code which allows for the detection of errors is termed as error detecting code.	Understand	CO 5	CLO 13	AEC522.13
7	Define ECEF?	The geocentric equatorial coordinate system is used with the GPS system. It is called as earth centered, earth fixed coordinate system.	Remember	CO 5	CLO 13	AEC522.13
8	Define INSAT?	INSAT – Indian National Satellite System. INSAT is a Indian National Satellite System for telecommunications, broadcasting, meteorology and search and rescue services. It was commissioned in 1983. INSAT was the largest domestic communication system in the Asia-Pacific region.	Understand	CO 5	CLO 14	AEC522.14
9	Define DTH?	DBS television is also known as Direct To Home (DTH).	Remember	CO 5	CLO 13	AEC522.13
10	Define DBS?	Satellites are used to provide the broadcast transmissions. It is used to provide direct transmissions into the home. The service provided is known as Direct Broadcast Satellite services.	Understand	CO 5	CLO 13	AEC522.13

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
11	Define Forward Error Correction.	Complete process of decoding is applied on the received sequence to detect error positions in the sequence and correct the erroneous symbols.	Understand	CO 5	CLO 14	AEC522.14
12	Define DRSS.	Data Relay Satellite System (DRSS) is primarily meant for providing continuous/real time communication of Low-Earth-Orbit (LEO) satellites/human space mission to the ground station	Understand	CO 5	CLO 15	AEC522.15
13	Define MMSS.	This service consists of different types of earth stations such as mobile earth station (MES); ship earth station (SES); and communication earth station (CES). This service is mainly used in shipyards and military ships.	Understand	CO 5	CLO 15	AEC522.15
14	Define Mobile satellite service.	Mobile satellite service (MSS) is the term used to describe telecommunication services delivered to or from the mobile users by using the satellites. MSS can be used in remote areas lacking wired networks.	Understand	CO 5	CLO 15	AEC522.15
15	Define Epoch Mechanism.	Its operation models the system in such a way that the CRI starts with the transmission of exactly one packet (yields a throughput of 1) by determining when packets are transmitted for the first time.	Remember	CO 5	CLO 15	AEC522.15

Signature of the Faculty

Signature of HOD