Q) LORAN stands for ----> **long range navigation**
Q) The GPS space segment consists of 24 satellites in medium earth orbit at a normal altitude of ----> **20,200 km**
Q) The orbital period is approximately one-half of a sidereal day i.e. ----> **11 h 58 Min**
Q) GPS stands for ----> **Global Positioning satellite system**
Q) GPS originally called ----> **NAVSTAR**
Q) The secure high accuracy P code allows authorized users (mainly military) to achieve positioning accuracy of ----> **3m**
Q) The GPS system has been successful because it provides a direct readout of the present position of a GPS receiver with a typical accuracy of ----> **30 m**
Q) The satellites are clustered in groups of four called ----> **Constellations**
Q) GPS satellites can transmit ----> **signals that are modulated by several codes.** ----> **L-band**
Q) The GPS space segment consists of 24 satellites in medium earth orbit at a normal altitude of 20,200 km with an orbital inclination of ----> **55 degrees**
Q) MEO stands for ----> **Medium earth Orbit**
Q) The data are then transmitted to the satellite using a secure ----> **band link** and used to update onboard data. ----> **S-band**
Q) Velocity of the Electromagnetic waves in free space is equal to the velocity of light i.e. ----> **299,792,458 m/s**
Q) The receiver measures the time delay of the arrival of the bit sequence, which is ----> **Proportional** to the distance between the satellite and the GPS receiver.
Q) The same satellite appears in the same position in the sky each day. ----> **twice**
Q) The position of a GPS receiver is found by ----> **Trilateration**, which is one of the simplest and most accurate methods of locating an unknown position.
Q) The orbit of the 24 GPS satellites ensure that at any time, anywhere in the world, a GPS receiver can pick up signals from at least ----> **4** satellites.
Q) The GPS satellite weight is approximately ----> **1877 Kg**
Q) The satellite design lifetime approximately ----> **10 years**
Q) GPS satellites transmit signals at different frequencies. ----> **Two**
Q) (SPS) receives track the C/A code on L1 ----> **Standard positioning service**
Q) VOR stands for ----> **VHF omni range**
Q) DME stands for ----> **distance measuring equipment**
Q) LORAN uses pulse transmission in the ----> **kHz** RF band and can provide reliable navigation with accuracy of a fraction of a mile at ranges of hundreds of miles from the transmitters ----> **100 - 500**
Q) The satellite sends two signals of L1 and L2. The L2 signal is modulated with a ----> **Mbps** pseudorandom (PN) bit sequence called P code that is used by military positioning systems ----> **10.23**
Q) The accuracy of C/A code receivers was deliberately degraded some of the time by a processes called ----> **selective availability (SA)**
Q) GPS was preceded by an earlier satellite navigation system called ----> **transit**
Q) The beacons used by aircraft are called an ----> **non directional beacons**
Q) C/A stands for ----> **Coarse Acquisition**
Q) SA causes variations in the C/A code satellite transmission that result in ----> **less** accurate calculation of position.
Q) Antenna mid band receiver gain (dB) for a INTELSAT C earth station is given by --> 65
Q) Typical frequency (GHz) is used for INTELSAT - A Earth station is given by --> 6/4
Q) -------- ILS is essential when aircraft must land in conditions of poor visibility --> Indian landing system
Q) Antenna midband transmit gain (dB) for a INTELSAT B earth station is given by --> 54.1
Q) Antenna midband transmit gain (dB) for a INTELSAT C earth station is given by --> 66.4
Q) Typical frequency (GHz) is used for INTELSAT B Earth station is given by --> 6/4
Q) A -------- needle on a course deviation indicator (CDI) in the aircraft cockpit shows the aircrafts lateral position relative to a line leading to the runway threshold --> Vertical
Q) Antenna midband transmit gain (dB) for a INTELSAT A earth station is given by --> 64
Q) Antenna mid band receiver gain (dB) for a INTELSAT A earth station is given by --> 61
Q) Antenna mid band receiver gain (dB) for a INTELSAT B earth station is given by --> 51.5
Q) Typical LNA noise temperature (K) is used for INTELSAT - A Earth station is given by --> 40
Q) Typical dish diameter (m) is used for INTELSAT - B Earth station is given by --> 11-13
Q) Typical dish diameter (m) is used for INTELSAT - C Earth station is given by --> 19
Q) Typical polarization is used for INTELSAT - C Earth station is given by --> Linear
Q) Typical polarization is used for INTELSAT - B Earth station is given by --> Circular
Q) Typical polarization is used for INTELSAT - A Earth station is given by --> Circular
Q) Typical dish diameter (m) is used for INTELSAT - A Earth station is given by --> 30
Q) Typical frequency (GHz) is used for INTELSAT - C Earth station is given by --> 14/11
Q) Typical LNA noise temperature (K) is used for INTELSAT - C Earth station is given by --> 120
Q) Typical LNA noise temperature (K) is used for INTELSAT - B Earth station is given by --> 40
Q) Travelling Wave Tube (TWT) having output power in the following range, which is used in maritime satellite communication system --> 100-2500W
Q) Klystron having output power in the following range, which is used in maritime satellite communication system. --> 500-5000W
Q) FET (6 GHz, 14 GHz) having output power in the following range, which is used in maritime satellite communication system---> 5-50W , 1-6 W
Q) Bipolar Transistor having output power in the following range, which is used in maritime satellite communication system. --> upto 50 W
Q) Bipolar Transistor having Bandwidth, which is used in maritime satellite communication system --> Wide
Q) Klystron having Bandwidth, which is used in maritime satellite communication system-->
Small 40 MHz
Q) Travelling Wave Tube (TWT) having Bandwidth, which is used in maritime satellite communication system--> Large 500 MHz
Q) Typical main reflector rms surface tolerance (mm) is used for INTELSAT - C Earth station is given by --> 0.6
Q) Typical main reflector rms surface tolerance (mm) is used for INTELSAT - B Earth station is given by --> 0.8
Q) Typical main reflector rms surface tolerance (mm) is used for INTELSAT - A Earth station is given by --> 1.0
Q) The function of the Repeaters is --------- Amplify signals and transmit back
4-2 2nd mid of Satellite Communications FOR ECE

Q) The function of the altitude and orbit control is --> Altitude stabilization and orbit determination
Q) The function of the Thermal Control is --> Temperature regulation
Q) INMARSAT - Standard A Earth Station having typical diameter is --> 12 m
Q) INMARSAT - Standard A Earth Station having typical Beam width around in --> 10 degrees
Q) TVRO systems stand for --> Television Receive only systems
Q) The function of the Antennas is --> Receive and transmit back
Q) The function of the Electric power supply is --> Provides electric energy at various voltages levels.
Q) The function of the Propulsion is --> Provides velocity increments and torques
Q) INMARSAT Standard A Earth Station having typical Gain in --> 23 dB
Q) The number of voice channels in a TDMA system is given by --> 1 / r (R-NP/T)
Q) Length of time frame for TELESAT CANADA satellite system is --> 250 micro Seconds
Q) Length of time frame for SBS satellite system is --> 15 milli Seconds
Q) Length of time frame for INTELSAT - V satellite system is --> 2 milli Seconds
Q) Length of time frame for ADVANCED WEST STAR satellite system is --> 125-750 micro Seconds
Q) TTC stands for --> Telemetry tracking and command sub systems
Q) Mean time before failure is --> to the average failure rate --> Proportional
Q) Technique allow interconnection among large number of earth station terminals simultaneously via satellite --> Multiple access
Q) Length of time frame for TELECOM 1 satellite system is --> 20 milli Seconds
Q) Length of time frame for INTELSAT VI satellite system is --> 2 milli Seconds
Q) The ability of the satellite to carry many signals at the same time is known as --> Multiple accesses
Q) Is the process of combining a number of signals into a single signal, so that it can be processed by a single amplifier or transmitted over a single radio channel? --> Multiplexing
Q) In the following technique all users share the satellite at the same time, but each user transmits at a unique allocated frequency. --> FDMA
Q) In the following technique, each user is allocated a unique time slot at the satellite so that signals pass through the transponder sequentially. --> TDMA
Q) In the following technique, all users transmit to the satellite on the same frequency and at the same time. --> CDMA
Q) Major advantage of TDM when using the entire bandwidth of a transponder is that only is present in the transponder at one time, thus overcoming many of the problems caused by nonlinear transponders with FDMA. --> One signal
Q) A RF multiple access technique that allows a single transponder to be shared in time between RF carriers from different earth stations. --> TDMA
Q) Allocating a wideband transponder to a single narrow bandwidth signal is clearly wasteful, so --> is a widely used technique --> FDMA
Q) When an earth station sends one signal on a carrier, the FDMA access technique is called --> Single channel per carrier (SCPC)
Q) The output power of an operating transponder is related to its saturated output power by output back off. Back off is measured in --> Decibels
Q) TWTA has slightly characteristics when operated with a single carrier and multiple
carriers $\rightarrow$ Different
Q) VSAT networks and mobile satellite telephones often use single channel per carrier FDMA to share $\rightarrow$ bandwidth $\rightarrow$ transponder
Q) Typical intelsat FDM carriers with a bandwidth of $\rightarrow$ MHz carried 132 to 252 telephone channels $\rightarrow$ 10
Q) Products are generated whenever more than one signal is carried by a non-linear device $\rightarrow$ Intermodulation
Q) Products grow rapidly as the output of the transponder increases toward saturation $\rightarrow$
Third order inter modulation
Q) In this network, no central network control is needed $\rightarrow$ Random Access
Q) Satellite system was designed to use CDMA, with the advantage that an earth station can receive the same signal from more than one satellite at the same time, allowing soft handoff between satellites. $\rightarrow$ The Global star LEO
Q) Transmission are organized into frames, a frame contain one or two reference bursts that synchronize the network and identify the frame and a series of traffic bursts $\rightarrow$ TDMA
Q) The transponder can overcome problems by separating the uplink and downlink signals and their C/N ratios. $\rightarrow$ onboard processing transponder and baseband processing transponder
Q) CSC stands for $\rightarrow$ common signaling channel
Q) is also known as spread spectrum technique $\rightarrow$ CDMA
Q) Links between computers require protocols to ensure efficient transfer of data, and invarially use some form of packet communication. $\rightarrow$ digital
Q) Transponders are often used in demand access mode, allowing any configuration of FDMA channels to be adopted $\rightarrow$ bent pipe
Q) is a widely used satellite multiple access technique where the traffic density from individual users is low. $\rightarrow$ random access
Q) access is a scheme in which a number of users can occupy all of the transponder bandwidth all of the time. $\rightarrow$ CDMA
Q) Nominal capacity per satellite voice circuits of Global Star satellite is $\rightarrow$ 2400
Q) orbits lie exactly in the plane of the geographical equator of the earth. i.e the orbital path lies directly above the equator at all times $\rightarrow$ equatorial orbits
Q) In order to take advantage of the 0.45 km/s eastward rotational velocity of the earth, most satellites are launched toward the east into a $\rightarrow$ prograde orbit
Q) A westerly directed orbit is called a $\rightarrow$ orbit $\rightarrow$ retrograde orbit
Q) is the cumulative effect of radiation over the lifetime of the electronics in space and is mainly due to trapped electrons and photons in the van Allen belts. $\rightarrow$ Total dose
Q) Orbital altitude in km of Global star satellite is $\rightarrow$ 1414km
Q) Nominal capacity per satellite voice circuits of Iridium satellite is $\rightarrow$ 1110
Q) orbit is a special form of low earth orbit where the plane of the orbit maintains a constant aspect angle with the direction to the sun. $\rightarrow$ sun synchronous orbit
Q) Orbital altitude in km of Iridium satellite is $\rightarrow$ 780
Q) Orbital altitude in km of New LEO satellite is $\rightarrow$ 10355km
Q) Iridium satellite used following up and down link frequency in GHz is $\rightarrow$ 1.62135-1.6265
Q) Global Star satellite used following up and down link frequency in GHz is $\rightarrow$ 1.619-1.6215/2.4835-2.4985
Q) New LEO satellite used following up and down link frequency in GHz is \( \Rightarrow 1.980-2.010 / 2.170-2.200 \)
Q) LEO satellite has orbit and orbital height is given by \( \Rightarrow 750 \text{km, } 1800 \text{ km} \)
Q) MEO satellite has orbit and orbital height is given by \( \Rightarrow 10000 \text{km, } 14000 \text{km} \)
Q) Nominal capacity per satellite voice circuits of New LEO satellite is \( \Rightarrow 4500 \)
Q) New LEO satellite have Spot beams per satellite is \( \Rightarrow 163 \)
Q) Global Star satellite have maximum bandwidth in MHz is \( \Rightarrow 11.35 \)
Q) New LEO satellite have maximum bandwidth in MHz is \( \Rightarrow 30 \)
Q) Iridium satellite have Spot beams per satellite is \( \Rightarrow 48 \)
Q) Global Star satellite have Spot beams per satellite is \( \Rightarrow 16 \)
Q) Iridium satellite have maximum bandwidth in MHz is \( \Rightarrow 5.15 \)
Q) Global Star satellite have following life time \( \Rightarrow 7.5 \text{ years} \)
Q) New ICO satellite have following life time \( \Rightarrow 12 \text{ years} \)
Q) GEO satellite has orbit and orbital height is given by \( \Rightarrow 35786 \text{km} \)
Q) Iridium satellite has primary launchers (number per launch) \( \Rightarrow \text{Delta II and Proton (7)} \)
Q) Global Star satellite has primary launchers (number per launch) \( \Rightarrow \text{Delta II (5) and Soyuz (4)} \)
Q) New ICO satellite has primary launchers (number per launch) \( \Rightarrow \text{Atlas IIAS (1) and Proton (1)} \)
Q) Ellipsos satellite have following life time \( \Rightarrow 5 \text{ to } 7 \text{ years} \)
Q) Total scan angle for a LEO satellite is given by \( \Rightarrow 57.2 \)
Q) Total scan angle for a MEO satellite is given by \( \Rightarrow 21.5 \)
Q) Total scan angle for a GEO satellite is given by \( \Rightarrow 8.25 \)
Q) The Iridium system used \( \Rightarrow \text{satellites in LEO, for example to provide continuous global coverage} \( \Rightarrow 66 \)
Q) The satellite need not have a \( \Rightarrow \text{battery capacity for eclipse operation since it is always illuminated} \( \Rightarrow \text{large} \)
Q) The average flux density across the coverage zone is therefore is given by \( \Rightarrow P_r G_r / A \text{ watts} / \text{m}^2 \)
Q) Teledesic satellite have orbital height in km is given by \( \Rightarrow 1400 \)
Q) The following satellite is called Early Bird satellite \( \Rightarrow \text{INTELSAT-I} \)
Q) GPS uses 24 satellites in orbits with an altitude of 20,000 km and an inclination of \( \Rightarrow 55 \text{ degrees} \)
Q) Satellite change (rotation) in the orbital plane is called \( \Rightarrow \text{precession} \)
Q) Sky bridge satellite have orbital height in km is given by \( \Rightarrow 1469 \)
Q) Sky bridge satellite have orbital inclination is given by \( \Rightarrow 53 \)
Q) Sky bridge satellite have orbital inclination is given by \( \Rightarrow 90 \)
Q) The effective receiving area of this antenna is given by \( \Rightarrow A_e = G_r \lambda^2 / 4 \pi \)
Q) The received power at the mobile earth station is given by \( \Rightarrow P_r = F \ast A \)
Q) In a \( \Rightarrow \text{device, phase control is achieved in the feed matrix placed between the high power amplifier and the radiating antenna elements.} \Rightarrow \text{passive device} \)
Q) \( \Rightarrow \text{array antenna usually has a nonmechanically steered array of radiators} \Rightarrow \text{phased} \)
Q) The following antennas are called passive devices \( \Rightarrow \text{both dipoles and feed horns} \)
Q) In a \( \Rightarrow \text{device, there is a phase shifter per element per beam.} \Rightarrow \text{active device} \)
Q) Plane wave that is present in the aperture of a focused parabolic reflector antenna becomes distorted when the feed horn is moved away from the focus, resulting in an effect known as \( \Rightarrow \text{coma} \)
Q) In DBS-TV family satellite, DBS-1R have location in geo stationary orbit —– 1010 W longitude
Q) Parabolic reflector antenna is converting the spherical wave fronts into ——- wave fronts. —–> plane
Q) Coma causes a reduction in antenna ——-> either directivity, power gain or gain
Q) In U.S satellite Digital Audio Radio Service, XM Satellite Radio Inc. having transmission rate before FEC —-> 4.0 Mbps
Q) In DBS-TV family satellite, ECHOSTAR -6 have location in geo stationary orbit —– 119° W longitude
Q) In DBS-TV family satellite, ECHOSTAR -6 have frequency band is ——-> ku band (12.2 -12.7 GHz)
Q) In DBS-TV family satellite, DBS 1R have frequency band is ———> ku band (12.2 -12.7 GHz)
Q) In U.S satellite Digital Audio Radio Service, XM Satellite Radio Inc. having downlink modulation is ———> TDM - QPSK
Q) In U.S satellite Digital Audio Radio Service, Sirius Satellite Radio Inc. having downlink modulation is ———> TDM - QPSK
Q) In DBS-TV family satellite, DBS 1R have transmitting antenna is ———> 2.72 m
Q) In DBS-TV family satellite, ECHOSTAR 6 have transmitting antenna is ———> 2.39 m
Q) In DBS-TV family satellite, DBS 1R have receiving antenna is ———> 1.32 m
Q) In DBS-TV family satellite, ECHOSTAR 6 have receiving antenna is ———> 1.19 m
Q) In U.S satellite Digital Audio Radio Service, Sirius Satellite Radio Inc. having uplink frequencies ———> 7060-7072.5 MHz
Q) In U.S satellite Digital Audio Radio Service, XM Satellite Radio Inc. having uplink frequencies ———> 7050-7075 MHz
Q) In U.S satellite Digital Audio Radio Service, Sirius Satellite Radio Inc. having downlink frequencies ———> 2328.5-2332.5 MHz
Q) In U.S satellite Digital Audio Radio Service, XM Satellite Radio Inc. having downlink frequencies ———> 2328.5-2332.5 MHz
Q) In U.S satellite Digital Audio Radio Service, Sirius Satellite Radio Inc. having transmission rate before FEC ———> 4.4 Mbps
Q) In U.S satellite Digital Audio Radio Service, XM Satellite Radio Inc. having terrestrial repeaters ———> 1500 in 70 cities
Q) In U.S satellite Digital Audio Radio Service, Sirius Satellite Radio Inc. having terrestrial repeaters ———> 105 in 46 cities
Q) LEO satellite saturated output power is given by ———> 10 W
Q) LEO satellite uplink frequency for mobile terminal is given by ———> 1650 MHz
Q) LEO satellite transponder bandwidth is given by ———> 1 MHz
Q) LEO satellite down link frequency for mobile terminal is given by ———> 1550 MHz
Q) In LEO satellite Gateway station parameters, Antenna Gain (Transmit, 14.0 GHz) is given by ———> 55 dB
Q) In LEO satellite Mobile Terminal parameters, Receive bit rate (Before FEC encoder) is given by ———> 96 kbps
Q) In LEO satellite Mobile Terminal parameters, Transmit bit rate (Before FEC encoder) is given by ----> 4800 bps
Q) In LEO satellite Gateway station parameters, Transmitter output power (maximum per transponder) is given by ----> 10 W
Q) In LEO satellite Gateway station parameters, Transmit bit rate (Before FEC encoder) is given by ----> 300 kbps
Q) In LEO satellite Mobile Terminal parameters, Receiver system Noise Temperature is given by ----> 300 K
Q) In LEO satellite Mobile terminal parameter, Transmitter output power is given by ----> 0.5 W
Q) In LEO satellite Gateway station parameters, Antenna Gain (Receive, 11.5 GHz) is given by ----> 53.5 dB
Q) In LEO satellite Gateway station parameters, Receive bit rate (Before FEC encoder) is given by ----> 4800 bps
Q) Performance of an improved VSAT Star Network with 1.4 m Diameter VSAT Antennas and 1W transmit Amplifier has channel rate for inbound is given by ----> 64 kbit/s
Q) WWII aircraft needed to navigate to targets over ----------- where there were no VORs available. -----> enemy territory
Q) In GPS, there must be four satellites transmitting suitably coded signals from known positions. Three satellites are required to provide the three distance measurements and the forth to remove receiver ---------- error -----> clock
Q) In LEO satellite Gateway station parameters, Receiver system Noise Temperature is given by ----> 140 K
Q) Performance of an improved VSAT Star Network with 1.4 m Diameter VSAT Antennas and 1W transmit Amplifier has channel rate for outbound is given by ----> 17.3 kbit/s
Q) The aircraft DME equipment transmit a ------ and measures the time for the round trip to the VOR and back, which provides a measurement of range to the VOR. -----> pair of pulses
Q) A glide slope transmitter at the side of the runway transmits another radio beam which points upward at about ---------> 3 degrees
Q) WAAS stands for ---------- > wide area augmentation system
Q) DBS-1,2,3 and Echostar-1-5 satellites are used for ---------- > direct to home digital television broadcasting