**Enrollment No: _____ Exam Seat No:_____**

# C.U.SHAH UNIVERSITY

## Summer Examination-2018

**Subject Name : Satellite Communication**

**Subject Code : 4TE06SCM1** **Branch: B.Tech (EC)**

**Semester : 6** **Date : 04/05/2018** **Time : 02:30 To 05:30** **Marks : 70**

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

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**Q-1** **Define following terms:** **(14)**

**a)** Subsatellite path
**b)** Perigee
**c)** Ascending node
**d)** Inclination
**e)** Retrograde orbit
**f)** Right ascension of the ascending node
**g)** True anomaly
**h)** Polar Orbit
**i)** Bus
**j)** Transponder
**k)** Apogee Height
**l)** Nutation
**m)** FDMA
**n)** TDMA

**Attempt any four questions from Q-2 to Q-8**

**Q-2** **Attempt all questions** **(14)**

**a)** What is Limit of Visibility? Find the maximum possible value of it.
**b)** Explain with diagrams Kepler's laws of planetary motion. Calculate the radius of a circular orbit for which the period is 1-day.

**Q-3** **Attempt all questions** **(14)**

**a)** A geostationary satellite is located at 90°W. Calculate the azimuth angle for an earth-station antenna at latitude 35°N and longitude 100°W. Also Find the range and antenna elevation angle.
**b)** Determine the angle of tilt required for a polar mount used with an earth station at latitude 49° north. Assume a spherical earth of mean radius 6371 km, and ignore earth-station altitude.

**Q-4** **Attempt all questions** **(14)**

**a)** Explain Three axis stabilization with figure.
**b)** Write a short note of Wideband Receiver.

**Q-5** **Attempt all questions** **(14)**

**a)** Explain main units in a home terminal DBS TV receiving system with figure.
**b)** Write a short note on master antenna TV (MATV).

**Q-6** **Attempt all questions** **(14)**

**a)** Explain Equivalent Isotropic Radiated Power in detail. Calculate the gain in decibels of a 3-m Paraboloidal antenna operating at a frequency of 12 GHz. Assume an aperture efficiency of 0.55.
**b)** An uplink at 14 GHz requires a saturation flux density of - 91.4 $dBW/m^2$ and an input BO of 11 dB. The satellite [G/T] is - 6.7 $dBK^{-1}$, and receiver feeder losses amount to 0.6 dB. Calculate the carrier-to-noise density ratio.

**Q-7** **Attempt all questions** **(14)**

**a)** An antenna has a noise temperature of 35 K and is matched into a receiver which has a noise temperature of 100 K. Calculate (a) the noise power density and (b) the noise power for a bandwidth of 36 MHz.
**b)** Write a Short Note on VSAT.

**Q-8** **Attempt all questions** **(14)**

**a)** Explain MPEG Compression standard with block schematic.
**b)** Write a Short note on SPADE System.