

C.U.SHAH UNIVERSITY

Winter Examination-2018

Subject Name: Satellite Communication

Subject Code: 4TE06SCM1

Branch: B.Tech (EC)

Semester: 6

Date: 30 /10 /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 Attempt the following questions (14)

- a) What is Broadcasting Satellite Service?
- b) Define the term Ascending node.
- c) Define the term EIRP.
- d) Define the term Nutation.
- e) What is BAPTA?
- f) Define the term Descending node.
- g) Define the term Argument of perigee.
- h) Define the term Prograde Orbit.
- i) Define the term Bus.
- j) Define the term Right ascension of the ascending node.
- k) Define the term Retrograde Orbit.
- l) Define the term Feeder Loss.
- m) Define the term TDMA.
- n) Define the term Momentum Bias.

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

Q-2 Attempt all questions (14)

- a) The orbit for an earth-orbiting satellite orbit has an eccentricity of 0.15 and a semi-major axis of 9000 km. Determine (a) its periodic time; (b) the apogee height; (c) the perigee height. Assume a mean value of 6371 km for the earth's radius.
- b) State Kepler's three laws of planetary motion and its importance.

Q-3 Attempt all questions (14)

- a) What are the conditions for an orbit to be geostationary? Prove that there is only one geostationary orbit.
- b) 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 .

Q-4 Attempt all questions (14)

- a) An earth station is located at latitude 12°S and longitude 52°W . Calculate the



antenna look angles for a satellite at 70°W .

- Q-5** **b)** Write a short note on GPS System. **(14)**
 Attempt all questions
- Q-6** **a)** Explain Wideband Receiver with diagram. **(14)**
 b) Explain MPEG-2 Encoder with diagram.
 Attempt all questions
- Q-7** **a)** Explain station keeping of a satellite in detail. **(14)**
 b) Write short note on Community Antenna TV System.
 Attempt all questions
- Q-8** **a)** Derive the equation for system noise for amplifier connected in cascade. An LNA is **(14)**
 connected to a receiver which has a noise figure of 12 dB. The gain of the LNA is
 40 dB, and its noise temperature is 120 K. Calculate the overall noise temperature
 referred to the LNA input.
 b) Enlist and explain all transmission losses.
- Q-8** **Attempt all questions** **(14)**
 a) Write a short note on VSAT.
 b) Derive the equation of noise temperature for amplifiers connected in cascade.

