Registration No: | | | | | | | | | | |

Total Number of Pages:02 **M.TECH**

P2ECCC02

2nd Semester Regular Examination 2016-17

Satellite Communication System

BRANCH: ETC / COMM. SYSTEM / COMM. ENGG./ ELECTRO &

Time: 3 Hours

Max Marks: 100

Q.CODE:Z506

Answer Question No.1 which is compulsory and any FOUR from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: ***Short answer type*** **(2 x 10)**

a) Why uplink frequency is greater than downlink frequency in satellite communication?
b) 25 dBm – 10 dBm = _____ .
c) Define multiplexing.
d) State Kepler's second law of planetarium motion.
e) Define Geostationary orbit.
f) If uplink and downlink C/N ratio is 20 decibel, then find out the overall C/N ratio.
g) What do understand by noise figure and write its relation with noise temperature.
h) The gain of received antenna is 48 dB at 4 GHz. Find the value of the gain of received antenna at 6 GHz.
i) Define frame efficiency.
j) What are the advantages of TDMA over FDMA?

Q2 **a)** State and proof Kepler's 3rd law of planetarium motion. **(10)**
b) What are the different types of satellite orbits?Discuss the merits and demerits. **(10)**

Q3 **a)** Explain TTC & M system in details. **(10)**
b) How the performance of a satellite impaired due to external factors? Also suggest suitable methods to overcome the same. **(10)**

Q4 **a)** From the calculation of system noise temperature prove that C/N ratio is directly proportional to G/T ratio. **(10)**
b) What are the functions of transponder and LNA? Explain single conversion and double conversion with proper block diagram. **(10)**

Q5 **a)** Derive the satellite link design equation. **(10)**

b) A satellite at a distance of 40,000 Km from a point on earth surface radiates a power of 10 W from an antenna with a gain of 17dB in the direction of the observer. Find the flux density at the receiving point and the power received by an antenna at this point with an effective area of 10 m^2. **(10)**

If the satellite operates at a frequency of 11 GHz having receiving antenna gain of 52.3 dB. Find the received power in dBW .

Q6 **a)** Compare the silent features of FDMA, TDMA. **(10)**

b) Explain Direct sequence spread spectrum in details. **(10)**

Q7 **a)** What are “Intermodulation” and “Back-off”? Discuss their appreciations in the context of single carrier and multi carrier transmission. **(10)**

b) With a neat block diagram explain the function of a SPADE system. **(10)**