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IV/IV B.Tech (Regular) DEGREE EXAMINATION

OCTOBER, 2016

Electronics and Communication Engineering

FIRST SEMESTER

Satellite Communications

Time: Three Hours

Maximum : 60 Marks

Answer Question No.1 compulsorily.

(1X12 = 12 Marks)

Answer ONE question from each unit.

(4X12=48 Marks)

1. Answer all questions

(1X12=12 Marks)

a	Define perigee.
b	What are geostationary satellites?
c	Define angle of inclination of a satellite orbit.
d	What is meant by station keeping?
e	Define output back-off.
f	Define packet through put.
g	Define system noise temperature.
h	Define G/T ratio of earth station.
i	What are the disadvantages of downlink design?
j	What are the advantages of vsat?
k	What is the height of GPS satellite in orbit?
l	What are the disadvantages of Differential GPS?

UNIT – I

2.a	What are look angles ? Explain how do you calculate azimuth angle.	6M
2.b	An earth station situated in the Docklands of London, England , needs to calculate the look angle to a geostationary satellite in the Indian ocean operated by INTELSAT. The details of the earth station site and the satellite are as follows: earth station latitude and longitude are 52.0° N and 0° , satellite longitude (sub-satellite point) is 66.0° E. Find the central angle γ , elevation angle E_l , intermediate angle α , azimuth angle.	6M

(OR)

3.a	Explain in detail about orbital effects in communication system performance	8M
3.b	State keplers laws of planetary motion.	4M

UNIT – II

4.a	Explain in detail about Telemetry, Tracking and Command subsystem with neat block diagram	6M
4.b	What are various types of antennas used in satellites.	6M

(OR)

5.a	Explain in detail about SPADE DAMA.	8M
5.b	compare FDMA,TDMA & CDMA techniques used in satellite communications.	4M

UNIT – III

6.a	State and derive Friss formula	6M
6.b	An earth station antenna has a diameter of 30m,has a n overall efficiency of 68% and is used to receive a signal at 4150MHz .At this frequency the system noise temperature is 79K when the antenna points at the satellite at an elevation angle of 28° .What is the earth station G/T ratio under these conditions. What is the new G/T value when system noise temperature is 89K?	6M

(OR)

7.a	What are the design considerations of satellite uplink and downlink design	6M
7.b	Explain about architecture of VSAT	6M

UNIT – IV

8.a	What are GPS principles and bring out salient features	8M
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8.b	Find the exact altitude of a GPS satellite that has an orbital period equal to precisely one half of a side real day .use a value of mean earth radius $r_e=6378.14\text{km}$ and a side real day length of 23h 56min 4.1s	M
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(OR)

9.a	Why superheterodyne receivers are used in GPS? Explain with a block diagram.	6M
9.b	How to retrieve Navigational messages from GPS satellites	6M