SP-164

Seat No.	

Total No. of Pages : 3

B.Tech. (E&TC) (Semester - VII) (CBCS) Examination, November - 2023

SATELLITE COMMUNICATION (PCC-ETC 701)

Sub. Code : 83823

Day and Date : Wednesday, 29 - 11 - 2023 **Total Marks : 70**

Time : 10.30 a.m. to 01.00 p.m.

Instructions :
1) **Use non-programmable calculator is permissible.**
2) **Figures to the right indicate full marks.**
3) **Assume suitable data if required.**

Q1) **Answer the following MCQ questions.** **[7 × 2 = 14]**

i) The satellite that is used as a relay to extend communication distance is called as _____.

a) Relay satellites b) Communication satellites

c) Repeater satellites d) Geosynchronous satellites

ii) The transmitter-receiver combination in the satellite is known as a _____.

a) Relay b) Repeater

c) Transponder d) Duplexer

iii) Why is there a huge spectrum space between the transmitted and received signal in satellite communication?

a) Reduce interference

b) Maximum efficiency

c) Less attenuation

d) To reduce space occupied by filters

iv) GPS in satellite communication stands for:

a) Global prime system

b) Global peace summit

c) Global postal system

d) Global positioning sytem

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v) What is true in case of Equatorial orbit

a) Equatorial orbit lie exactly on the equator of earth

b) Equatorial orbit lie perpendicular to earth equator

c) Equatorial orbit is inclined to the equator

d) All of above

vi) Which frequency band is used for connecting the satellite system with the public switched telephone network?

a) L band b) Ku band

c) C band d) Ka band

vii) DBS stands for _____

a) Direct Broadcast system b) Direction to Broadcast system

c) Detection of broadband d) All the above

***Answer the following Descriptive Questions**

***Q2)* Answer Any Two Questions.** **[2 × 7 = 14]**

a) Explain different orbital perturbations.

b) Derive expression for power received (PR) by earth station from satellite.

c) Define noise figure and G/T ratio with relevant expressions

***Q3)* Answer Any Two Questions.** **[2 × 7 = 14]**

a) Explain in detail Ku band Uplink and Downlink design

b) Write short note on Space qualification.

c) A satellite is orbiting Earth in a uniform circular orbit at a height of 630 km from the surface of the Earth. Assuming the radius of the Earth and its mass to be 6370 km. and 5.98×10^{24}kg respectively, Determine the velocity of the satellite. (Take gravitational constant $G=6.67 \times 10^{-11}$ Nm^2/kg^2).

Q4) **Answer Any Two Questions.** **[2 × 7 = 14]**

a) Explain common networking protocols

b) Explain Elevation angle consideration in satellite

c) Explain working principle of GPS Navigation system

Q5) **Answer Any Two Questions.** **[2 × 7 = 14]**

a) Explain Digital DBS TV

b) Write a note on equatorial and inclined orbits

c) Explain basic characteristics of satellite networks

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