Satellite Comm. N/W 24

Q.P. Code :729600

(3 Hours) [Total Marks : 80

N.B. : 1. Question No.1 is compulsory
2. Attempt any three from remaining
3. Assume suitable data if necessary

1. a) Why does a satellite in highly inclined elliptical orbit spend most of its orbital period over higher latitude regions? What are the advantages and disadvantages of highly inclined orbit? 5

b) Why LAN is placed closed to antenna of out dour unit? 5

c) What are space particles? What is their impact on the satellites? The TWT has a limited life and is considered less reliable than other sub-system. Justify. 5

d) Differentiate between window and frame organization. 5

2. a) What are the technical constraints which limit the maximum available DC power from a satellite? Draw and explain Centralized and Distributed Power sub-system 10

b) Explain 10
1) Input back off and Output back off.
2) AM/PM conversion.

3 a) Explain T T & C subsystem. Explain the use of multi-tone frequency in tracking system. 10

b) What are the different types of lasers used for satellite communication? Explain acquisition link model for optical communication. 10

4 a) With the help of a block diagram describe the working of transmit receive earth station used for telephone traffic. 10

b) Explain in detail the operation of the Spade system of demand assignment. Explain what is meant by thin route service? Suggest the type of satellite access is most suitable for this service. 10

5. a) A 12 GHz receiver consists of an R.F stage with gain G1 = 30 dB and noise temperature T1 = 20K, a down converter with gain G2 = 10 dB and noise temperature T2 = 360K and an IF amplifier stage with gain G3 = 15 dB and noise temperature T3 = 1000 K . Calculate the effective noise temperature and noise figure of the system. Take reference temperature as 290 K. 8

TURN OVER

Compute the noise figure specifications of the three stages and then compute the overall noise figure from the individual noise figure specifications.

b) How do you define an "orbital cycle" in the case of sun-synchronous orbit? What is its significance for earth observation application?   6

c) What are the disadvantages of CDMA? Explain frequency hopping.   6

6 a) Write a note on Write a note on VSAT and GPS.

b) Draw and explain the satellite network architecture.

c) Explain Carrier recovery circuit.

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