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Question Paper Code : X60425

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020

Eighth Semester

Electronics and Communication Engineering

EC 2045 – SATELLITE COMMUNICATION

(Regulations 2008)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. Differentiate geo synchronous and geostationary satellites.
2. A satellite moving is orbiting in the equatorial plane with a period from perigee to perigee of 12 hr. Given the eccentricity is 0.002. Calculate the semi major axis. The earth's equatorial radius is 6378. 1414 km.
3. Why is noise temperature a useful concept in communication receivers ?
4. Write the objectives with which the downlink of any satellite communication system must be designed.
5. Define single access and multiple access.
6. What is the need of reference burst in TDMA ?
7. What is terrestrial interface ?
8. An antenna has a noise temperature of 35 K and it is matched into a receiver which has a noise temperature of 100 K. Calculate the noise power density and the noise power for a BW of 36 MHz.
9. When the available bandwidth is 500 MHz, how many transponder each of bandwidth 24 MHz can be accommodated ?
10. What is meant by congestion and slowstart with reference to Internet traffic ?

**PART – B****(5×16=80 Marks)**

11. a) i) A satellite is orbiting in the equatorial plane with a period from perigee to perigee of 12 h. Given that the eccentricity is 0.002. Calculate the semi major axis. The earth's equatorial radius is 6378.1414 km. **(4)**
ii) Explain the orbital perturbations in detail. **(12)**
(OR)
- b) i) Determine the limits of visibility for an earth station situated at mean sea level, at latitude 48.42° north and longitude 89.26 degrees west. Assume a minimum angle of elevation of 5°. **(6)**
ii) Discuss about launching procedures. **(10)**
12. a) How do the TT and C subsystem perform aboard the spacecraft ? Also explain the working of a transponder unit. **(16)**
(OR)
- b) How is the performance of a satellite impaired due to external factors ? Also suggest suitable methods to overcome the same. **(16)**
13. a) Briefly discuss about analog voice transmission. **(16)**
(OR)
- b) Compare the salient features of FDMA, TDMA and CDMA. **(16)**
14. a) Show how MATV is used to provide reception of DDS to a small group of users. When this group is large what type of antenna should be used ? Explain. **(16)**
(OR)
- b) Analyse the functioning of Transmit-Receive Earth stations. With a block diagram explain how the redundant earth station functions. **(16)**
15. a) i) Discuss in detail about the GPS and GSM Mobile satellite services. **(8)**
ii) Write notes on : LEO and MEO. **(8)**
(OR)
- b) Write in detail about the satellite services like E-mail, Video Conferencing, Internet and Digital Audio Broadcast. **(4×4)**
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