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**Question Paper Code : 21343**

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Eighth Semester

Electronics and Communication Engineering

EC 2045/EC 810 — SATELLITE COMMUNICATION

(Regulation 2008)

(Common to PTEC 2045 — Satellite Communication for B.E. (Part-Time) Seventh Semester — Electronics and Communication Engineering — Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Given the geostationary orbital radius 'r', the Earth's radius 'R' and speed of light 'C' how will you compute the time taken for a signal to pass from Earth to the Satellite and back again?
2. Enlist the traditional orbital Keplerian elements.
3. How is the attitude of a satellite controlled through active control?
4. Why the operation near the saturation point of a TWTA is to be avoided when multiple carriers are being amplified simultaneously?
5. When VSAT-type terminals involved CDMA offers several advantages for satellite networking. What are they?
6. Point out the function of (a) the burst code word and (b) the carrier and bit-timing recovery channel in a TDMA burst.
7. Give the reason for deploying a demodulator/remodulator unit in our home television set when we want to function in a satellite TV/FM receiving system.

8. What is known as polarization interleaving with reference to the Down link frequency?
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 the equatorial plane with a period from perigee to perigee of 10h. Given that the eccentricity is 0.002 and the earth's equatorial radius is 6378.1414 km how will you calculate the semi major axis.  
(ii) Summarise how you will determine the look angles for the geostationary orbit? What are known as sun-synchronous orbits.

Or

- (b) (i) How will you determine the sub satellite point?  
(ii) Write a brief note on launch vehicles and propulsion.
12. (a) How do the TT and C subsystem perform aboard the spacecraft? Also explain the working of a transponder unit.

Or

- (b) How is the performance of a satellite impaired due to external factors? Also suggest suitable methods to overcome the same.
13. (a) (i) Describe the ways in which demand assignment may be carried out in FDMA.  
(ii) What is known as pre-assigned traffic?

Or

- (b) (i) Calculate the probability of false detection, when  $N = 10$  and  $d = 4$ .  
(ii) For digital video broadcast what type of multiple access is best suited. Justify your answer.

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.

Or

- (b) Analyse the functioning of Transmit — Receive Earth stations. With a block diagram explain how the redundant earth station functions.
15. (a) Enumerate how GSM and GPS deploying Satellites have improved the mobility of the customers.

Or

- (b) Write short notes on the specialized services offered by satellites for video conferencing e-mail and internet.
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