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Question Paper Code : 80423

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

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. 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. What is the need for thermal control and propulsion?
4. Mention about the functions of AOCs.
5. Distinguish between preassigned and demand assigned traffic.
6. What is frequency reuse in satellites?
7. What is the role played by duplexers?
8. State the functions of a LNA. Where is it employed?
9. What are the services rendered by DTH?
10. How is satellite used for video conferencing?

PART B — (5 × 16 = 80 marks)

11. (a) Explain how Kepler's and Newton's laws are used to describe the orbit. (16)

Or

- (b) Explain the following :
- (i) Orbital perturbations. (8)
 - (ii) Launching vehicles. (8)

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. (8)
- (ii) What is known as pre-assigned traffic? (8)

Or

- (b) (i) Calculate the probability of false detection, when $N = 10$ and $d = 4$. (8)
- (ii) For digital video broadcast what type of multiple access is best suited. Justify your answer. (8)

14. (a) With neat diagrams, explain the procedure for measuring critical satellite parameters like C/N_0 and G/T . Emphasise on the significance of these parameters. (16)

Or

- (b) In detail, explain the block diagram representation of a typical digital earth station (Transmitter and Receiver). Give the block diagrams. (16)

15. (a) Explain the types of INTELSAT satellites with respect to basic spacecraft characteristics and vehicle type. (16)

Or

- (b) (i) Explain the block diagram of an outdoor unit for a DBS home receiver. (8)
- (ii) With a block schematic explain about DTH system. (8)