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Question Paper Code : 50476

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Fifth/Seventh/Eighth Semester

Electronics and Communication Engineering

EC 8094 — SATELLITE COMMUNICATION

(Common to Electronics and Telecommunication Engineering/
Geoinformatics Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the advantages and disadvantages of satellite communication system over other types of communication methods.
2. What are the factors need to be considered for the selection of launch vehicles?
3. State the necessity of a transponder and list a few types.
4. Brief the functions of kick motors.
5. What is system noise temperature?
6. Specify the various interferences that affect the satellite link performance.
7. What is cyclic code and mention its merit and demerits?
8. Why multiplexing of signal is required?
9. Compare LEO, MEO, GEO and HEO satellites.
10. List a few application of VSAT.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss on look angle determination, elevation, and azimuth calculation. How effects of sun and moon play a major role on a satellite?

Or

- (b) Explain Kepler's laws of planetary motion with application to satellite communication in detail.

12. (a) Discuss about TTC and monitoring services which are essential for the operation of a communication satellite.

Or

- (b) Discuss on the types of antenna used for satellite communication in detail consider the design parameters and frequency spectrum.

13. (a) Derive the general link equation. Obtain the expression for C/N and G/T ratios. Explain the importance of the ratios on satellite link design.

Or

- (b) What do you mean by the term frequency reuse? Discuss the technique relating to satellite communication in detail with example.

14. (a) Compare and contrast modulation TDMA, FDMA and CDMA schemes in detail.

Or

- (b) Explain how the improvement of a DAMA over pre-assignment multiple access is made using Erlang B formula.

15. (a) Describe the main features and services offered by INTELSAT satellite systems. How do these services compare with services offered by other satellites used for communication?

Or

- (b) With the help of block diagram explain the operation of INMARSAT.

PART C — (1 × 15 = 15 marks)

16. (a) Derive the rocket equation stating the necessary assumption and discuss its significance.

Or

- (b) What are the forces acting on satellite during the powered flight in the atmosphere? Derive the equations of motion for that powered flight stating necessary assumptions.