C

Reg. No. : | | | | | | | | | | | | |

Question Paper Code: U4404

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

Professional Elective

Electronics and Communication Engineering

21ECV404 SATELLITE COMMUNICATION AND SERVICES

(Regulations 2021)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. For global communication, the minimum number of satellite needed is — CO1- U

   (a) one (b) three (c) seven (d) eleven

2. The downlink frequency in the C band transponder is — CO1- U

   (a) 6 GHz (b) 4 GHz (c)14 GHz (d) 11 GHz

3. The three axes referred to the three-axis attitude stabilization are, except — CO1- U

   (a) Pitch (b)Yaw (c) Roll (d)Speed

4. The access scheme used by GPS — CO1- U

   (a) FDMA (b) OFDMA (c) CDMA (d) TDMA

5. What band does VSAT first operate? — CO1- U

   (a) X-band (b) C-band (c) Ku-band (d) L-band

PART – B (5 x 3= 15 Marks)

6. When will the sun comes within the beamwidth of the earth station antenna and explain this effect. — CO1- U

7. Give the effects of rainfall on transmission of data. — CO1- U

8. Estimate the gain in decibel for 3m paraboloidal antenna operating at the frequency of 12GHz. Assume aperture efficiency of 0.55. — CO4-App

9. What is FDMA and what are the limitations of FDMA-satellite access? — CO3-U

10. Differentiate GPS and differential GPS. — CO1- U

PART – C (5 x 16= 80Marks)

11.	(a)	Describe the general operating principles of a TDMA network. Show how the transmission bit rate is related to the input bit rate	CO1-U	(16)
		Or		
	(b)	Explain SPADE systems with suitable diagram	CO1-U	(16)
12.	(a)	(i) What are the orbital Perturbation and explain them in detail.(8) (ii)Write a note on Limits of Visibility. (8)	CO1-U	(16)
		Or		
	(b)	(i) What are the orbital elements and explain them.(8) (ii)Write a note on atmospheric drag and station keeping.(8)	CO1-U	(16)
13.	(a)	(i) How the intermodulation noise occurred in TWT and derive C/N ratio.(8) (ii) Explain how the carrier to noise ratio is used to measure the performance of satellite uplink. (8)	CO1-U	(16)
		Or		
	(b)	(i) Give the link budget equation and derive the carrier to noise ratio for uplink analysis (8) (ii) Explain in detail about satellite uplink analysis. (8)	CO1-U	(16)
14.	(a)	Analyze the remote sensing data from satellites for weather forecasting.	CO3-Ana	(16)
		Or		
	(b)	Analyze the remote sensing data from satellites for military application.	CO3-Ana	(16)
15.	(a)	Analyze the Advanced applications based on satellite platforms	CO3-Ana	(16)
		Or		
	(b)	Analyze the Multimedia satellite services.	CO3-Ana	(16)