R20 Regulation *Subject code:3E8DH*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VIII Semester Supplementary Examinations, November 2025

SATELLITE COMMUNICATIONS

(ECE)

Maximum Marks: 70 Date: 27.11.2025 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	Bloom Tx
1	What are various satellite services allocated depends on frequency bands?	2M	CO1	BT1
2	Identify the launching stages of satellite.	2M	CO1	BT2
3	Give the function of Telemetry, Tracking and Command.	2M	CO2	BT1
4	Mention the use of frequency reuse technique in communication subsystem and how it is employed?	2M	CO2	BT2
5	What are the earth station parameters affecting C/N ratio?	2M	CO3	BT1
6	Draw TDMA frame structure.	2M	CO3	BT2
7	Enlist the basic requirements of an earth station antenna.	2M	CO4	BT1
8	What is terrestrial interface?	2M	CO4	BT1
9	Present the difference between delay and throughput.	2M	CO5	BT2
10	What is code accuracy?	2M	CO5	BT1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
11	List the advantages and applications of satellite communication.	10M	CO1	BT3
	OR			
12	a) What is Kepler's three laws of planetary motion? Give the mathematical formulation of Kepler's third law of planetary motion. b) Describe the orbit and explain how the satellite is located with respect to the earth.	5M 5M	CO1	BT2
13.	Examine how the attitude and orbit control system (AOCS) is achieved through spin stabilization system. Give necessary diagrams.	10M	CO2	BT4
	OR			
14	a) Justify the reasons behind why the transponders are connected in the communication channel with a neat diagram. b) What do you understand by reliability and space qualification? Explain significance of bath-tub curve.	5M 5M	CO2	BT4

15	a) From the calculation of system noise temperature prove that C/N ratio is directly proportional to G/T ratio. b) Consider the receive side of an earth station. The antenna gain is 65dB, and its noise contribution is 60 K. The waveguide loss is 0.5dB. Determine the equivalent noise temperature of LNA assuming that the noise contribution by the down converter is negligible and earth station G/T is 40dB/K.(T_o =300K)	5M 5M	CO3	BT4
	OR			
16	a) Explain in detail about intermodulation with relevant figures. b) Discuss about Parabolic antenna in detail.	5M 5M	CO3	BT3
17	Draw the block diagram of a general earth station and explain.	10M	CO4	BT3
	OR			
18	a) Illustrate the operations required for receiving a signal from the satellite using multicarrier earth station. b) Explain the main functions of earth station tracking system.	5M 5M	CO4	BT4
19	What are different satellite constellation designs? Explain any two of them.	10M	CO5	BT2
	OR			
20	a) Discuss in detail the process of satellite signal acquisition b)Explain about signal processing techniques used in GPS receiver.	5M 5M	CO5	BT2