R22 Regulation *Subject code: 4P7DF*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, May 2026

Satellite Communication

(ECE)

Maximum Marks: 60 Date:14.05.2026 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
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 (10X1M=10 Marks)		Marks	CO	Bloom Tx
1.a)	What are the advantage and disadvantages of satellite communication?	1M	1	L1
b)	Give the condition for a satellite to be placed in a Geo-stationary orbit.	1M	1	L2
c)	Define Apogee and Perigee.	1M	2	L2
d)	Identify the basic factors affecting satellite position.	1M	2	L3
e)	Mention about the functions of AOCs.	1M	3	L1
f)	What is EIRP?	1M	3	L2
g)	What are factors contributing to noise in an earth station receiving channel?	1M	4	L2
h)	What are the advantages of TDMA over FDMA?	1M	4	L2
i)	Give the three different types of applications with respect to satellite systems.	1M	5	L1
j)	What is DBS? Name any two services	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)			Marks	CO	Bloom Tx
2	a)	Give an overview of present and future trends of satellite communications.	5M	1	L3
	b)	Explain how Keplers and Newton's law are used to describe the orbit. Explain about satellite launch vehicles.	5M		L2
		OR			
3	a)	Name and explain the Keplerian element of satellite.	5M	1	L1
	b)	A satellite is orbiting in the equatorial plane with a period from perigee to perigee of 12 h. Given that the Eccentricity is 0.002. Calculate the semi major axis. The earth's equatorial radius is 6378.1414km.	5M		L1
4	a)	Examine how the attitude and orbit control system (AOCS) is achieved through spin stabilization system? Give necessary diagrams.	5M	2	L2

	b)	From the calculation of system noise temperature prove that C/N ratio is directly proportional to G/T ratio.	5M		L4
		OR			
5	a)	Explain the working of telemetry, tracking and control with a suitable diagram	5M	2	L3
	b)	Explain what is meant by satellite attitude and briefly describe two forms of attitude control.	5M		L1
6	a)	Explain in detail the test equipment measurement on G/T and C/No.	5M	3	L2
	b)	A receiving system has antenna noise temperature of 60K & its receiver noise figure 9dB. Find the system noise temperature if room temperature is 290K.	5M		L4
		OR	5M		
7	a)	Express FDMA in detail and also enumerate the interference in FDMA	5M	3	L3
	b)	Elucidate pre assigned and demand assigned TDMA systems.	5M		L3
8	a)	Illustrate the mesh and star architectures in a VSAT network.	5M	4	L3
	b)	Sketch the elements of satellite tracking system.	5M		L1
		OR			
9	a)	Describe the effective isotropic radiated power	5M	4	L2
	b)	List the design considerations of lower orbit.	5M		L1
10	a)	(i) Explain the concept behind DTH. (ii) Write in detail about the features of GPS.	5M	5	L2
	b)	Describe on the satellite navigational system.	5M		L1
		OR			
11	a)	Outline the three regions to allocate the frequency for satellite services.	5M	5	L3
	b)	Analyze the earth station technology and constellation of NGSO.	5M		L2