DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Winter Examination – 2022

Course: B. Tech. **Branch : Electronics Engineering** **Semester :VII**

Subject Code & Name: [BTEXPE704B] Satellite communication

Max Marks: 60 **Date: 07-02-2023** **Duration: 3 Hours**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	**Explain the Pulsed radar systems.**	CO1	**6**
B)	**Explain CW Doppler radar.**	CO1	**6**
C)	**Explain moving target indication RADAR.**	CO2	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	**State and explain Kepler's Three Laws of Planetary Motion.**	CO4	**6**
B)	**A satellite is in an elliptical orbit with a perigee of 1000 km and an apogee of 4000 km. Using a mean earth radius of 6378.14 km, find the period of the orbit in hours, minutes, and seconds, and the eccentricity of the orbit.**	CO4	**6**
C)	**Write a short note on Orbital Perturbations.**	CO3	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	**Explain typical tracking, telemetry, command and monitoring system.**	CO2	**6**
B)	**Explain Antenna Subsystems in Satellite.**	CO4	**6**
C)	**Explain Equipment Reliability in Satellite.**	CO4	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	**A satellite at a distance of 40,000 km from a point on the earth's surface radiates a power of 10W from an antenna with a gain of 17 dB in the direction of the observer. Find the flux density at the receiving point, and the power received by an antenna at this point with an effective area of 10 m^2.**	CO3	**6**
B)	**Suppose we have a 4-GHz receiver with the following gains and noise temperatures:**	CO2	**6**

$T_{in} = 25$ K $\quad G_{RF} = 23$ dB

$T_{RF} = 50$ K $\quad G_{IF} = 30$ dB

$T_{IF} = 1000$ K

$T_m = 500$ K

Calculate the system noise temperature assuming that the mixer has a gain G_m= 0 dB. Recalculate the system noise temperature when the mixer has a 10-dB loss. How can the noise temperature of the receiver be minimized when the mixer has a loss of 10 dB?

C)	**Derive the relationship between Power received and EIRP.**	CO3	**6**

Q. 5	**Solve Any Two of the following.**		**12**
A)	**Differentiate between TDMA and CDMA.**	CO4	**6**
B)	**Explain the features of CDMA**	CO4	**6**
C)	**Write a short note on SDMA.**	CO4	**6**

***** End *****