

Code No: R18A0429**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY****(Autonomous Institution – UGC, Govt. of India)****IV B.Tech - II Semester Regular/Supplementary Examinations, April 2023**
Satellite Communications**(ECE)**

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Time: 3 hours**Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 *A* What is the need for satellite communication? How a satellite Work? [7M]
 B Name the forces acting on Satellite and explain the importance of orbital velocity. [7M]

OR

- 2 *A* What are the salient features of a satellite ? Discuss the Advantages and Disadvantages of Satellite Communication. [7M]
 B Explain about Azimuth and Elevation angles with respect to satellite. [7M]

SECTION-II

- 3 *A* Formulate a general link equation for satellite communications using basic transmission theory. [7M]
 B Explain how the link budget serves as a tool for predicting performance and for recognizing if the system provides acceptable performance. [7M]

OR

- 4 *A* Explain the Attitude and Orbit Control system of a satellite With the help of a block diagram. [7M]
 B Explain telemetry, tracking, and command (TT&C) subsystem of a satellite With the help of a block diagram. [7M]

SECTION-III

- 5 *A* Describe the FHCDMA spread spectrum transmission and reception in code division multiple access. [7M]
 B What is inter modulation? Explain in detail. [7M]

OR

- 6 *A* Explain the importance of Rain attenuation as the most significant propagation impairment for satellite communication systems operating in the W/V band? [7M]
 B In a TDMA network the reference burst and the preamble each require 560 bits, and the nominal guard interval between bursts is equivalent to 120 bits. Given that there are eight traffic bursts and one reference burst per frame and the total frame length is equivalent to 40,800 bits, calculate the frame efficiency. [7M]

SECTION-IV

- 7** **A** Explain with the block diagram the working of the multi stage High Power Amplifier. [7M]
 B Explain the working of simplified GPS receiver with the aid of block diagram. [7M]

OR

- 8** **A** A satellite in earth orbit passes through its perigee point at an altitude of 200 km above the earth's surface and at a velocity of 7,850 m/s. Calculate the apogee altitude of the satellite. [7M]
 B How will differential GPS increase the accuracy of a satellite? [7M]

SECTION-V

- 9** **A** Discuss, in brief, the message transmission by FDMA by using M/G/I Queue. [7M]
 B Explain the process involved in Tree algorithm for Collision Resolution Protocols. [7M]

OR

- 10** **A** List the types of Medium Access Control, explain any one control. [7M]
 B With the aid of relevant diagrams explain working of slotted ALOHA [7M]
