

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur (GIET University)



B. Tech (Eighth Semester – Regular/Supplementary) Examinations, April – 2026
21BECPE48011/22BECPE48011 – Satellite Communication
(ECE)

Time: 3 hrs

Maximum: 70 Marks

(The figures in the right hand margin indicate marks)

PART – A**(2 x 5 = 10 Marks)**Q.1. Answer **ALL** questions

- | | CO # | Blooms Level |
|--|------|--------------|
| a. What is the significance of EIRP in satellite communication? | CO3 | K2 |
| b. Define nadir and zenith direction. | CO1 | K1 |
| c. What is subsatellite point? | CO2 | K2 |
| d. List out the types of antennas used in satellite communication? | CO4 | K1 |
| e. Write the two features of CDMA. | CO2 | K2 |

PART – B**(15 x 4 = 60 Marks)**Answer **ALL** the questions

- | | Marks | CO # | Blooms Level |
|---|-------|------|--------------|
| 2. a. What do you mean by Orbit? Explain about the different orbits of satellite communication with suitable diagram. | 8 | CO1 | K2 |
| b. What are the Kepler's three laws of planetary motion? Explain in details. | 7 | CO1 | K2 |
| (OR) | | | |
| c. Define look angle. Derive an expression for the Azimuth angle for a Geostationary satellite. | 8 | CO2 | K3 |
| d. A satellite at a distance of 40,000 km from a point on the earth's surface radiates a power of 10 W 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 . | 7 | CO3 | K3 |
| 3.a. Describe the Attitude and Orbit Control System (AOCS) and TT&C subsystem of a satellite with neat diagrams. | 8 | CO1 | K3 |
| b. Explain the working of TDMA system with frame structure and synchronization. | 7 | CO2 | K2 |
| (OR) | | | |
| c. Explain uplink and downlink design of a satellite communication system with necessary equations. | 8 | CO3 | K2 |
| d. Discuss rain attenuation and tropospheric scintillation and their impact on satellite links. | 7 | CO4 | K3 |
| 4.a. What do you mean by transponder? Explain about the single bent pipe transponder with suitable diagram. | 8 | CO1 | K1 |
| b. Write short notes on Cassegrain Antenna and SPADE. | 7 | CO2 | K2 |
| (OR) | | | |
| c. What do you mean by VSAT? Explain with suitable diagram. | 8 | CO1 | K1 |
| d. Explain the non-hydrometric effect on satellite. | 7 | CO3 | K1 |
| 5.a. Describe about the role of TTC&M in satellite communication. | 8 | CO1 | K1 |
| b. Describe beam steering techniques and their importance in satellite communication. | 7 | CO4 | K3 |
| (OR) | | | |
| c. Discuss launch vehicles and satellite launching techniques. Explain their role in communication systems. | 8 | CO1 | K2 |
| d. Explain the Global Positioning System (GPS) architecture and working principle. | 7 | CO2 | K1 |

--- End of Paper ---