

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



B. Tech (Sixth Semester - Regular) Examinations, April 2026 23BECPC36002 – Antennas and Microwave Engineering (ECE)

Time: 3 hrs

Maximum: 60 Marks

Answer ALL questions
(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. State the condition for impedance matching.	CO1	K2
b. What is butterfly effect in MTI radar?	CO4	K1
c. Define TE and TM modes.	CO2	K1
d. What is bunching?	CO3	K2
e. Define directivity.	CO4	K1

PART – B**(10 x 5 = 50 Marks)**Answer **ALL** the questions

	Marks	CO #	Blooms Level
2. a. Derive the transmission line equations with drawing equivalent circuit model.	5	CO1	K2
b. In a transmission line, the operating wavelength is 0.05m, the load impedance is 100 ohms and characteristic impedance is 75 ohms. Find out the position and as well as the length of the stub.	5	CO2	K1
(OR)			
c. Write about various losses in a Transmission line. A lossless terminated Transmission line has load impedance $(25 + j15) \Omega$ and characteristic impedance 100 Ω . Find out VSWR and Phase constant provided the wavelength 5 cm.	10	CO2	K3
3.a. Explain E plane Tee junction with application and derive its S matrix.	10	CO1	K1
(OR)			
b. A copper made rectangular cavity resonator is structured by $3 \times 1 \times 4$ cm and operates at the dominant modes of TE and TM. Find out its resonant frequency and quality factor. The conductivity of copper is 5.8×10^7 mho/m. Inside the cavity there is air.	4	CO2	K3
c. Describe microwave components (isolator, circulator) in detail with its S-Matrix.	6	CO1	K1
4.a. Explain construction, operation and application of SBD diode.	7	CO3	K2
b. Why is a PIN diode suitable for RF switching and attenuation applications?	3	CO1	K1
(OR)			
c. Explain construction, operation and application of TWT.	8	CO1	K1
d. A normal magnetron has the following parameters $b = 0.45$ m. Magnetic flux density is 1.2 mwb/m ² . Determine hall cut-off voltage.	2	CO3	K3
5.a. Write about various types of dipole antennas and compare it with monopole antenna.	7	CO1	K2
b. Define bandwidth and aperture of an antenna.	3	CO1	K1

(OR)

c.	Derive Friis transmission equation and explain significance.	7	CO4	K2
d.	Write advantage and applications of loop antenna.	3	CO1	K1
6.a.	Explain Reflector antenna working principle with applications.	6	CO1	K1
b.	The aperture dimensions of a pyramidal horn are 9×4 cm. It is operating at a frequency of 8 GHz. Find out beam width, Directivity and power gain.	4	CO4	K3
(OR)				
c.	Explain the complete radar signal processing chain, including display methods and detection techniques.	10	CO1	K1

--- End of Paper ---