R20 Regulation *Subject code:3P7DA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, May 2026

MICROWAVE ENGINEERING

(ECE)

Maximum Marks: 70 Date: 05.05.2026 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 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 (10X2M=20 Marks)		Marks	CO	BTL
1	Define Dominant mode.	2M	1	L1
2	List the typical applications of microwaves.	2M	1	L1
3	Define cavity resonator.	2M	2	L1
4	Define an Iris.	2M	2	L1
5	List the limitations of conventional tubes at microwaves.	2M	3	L1
6	List the types of Slow wave structures.	2M	3	L1
7	What is the difference between Travelling Wave Tube and Reflex Klystron.	2M	4	L1
8	What is LSA mode.	2M	4	L1
9	What are the properties of S-Matrix.	2M	5	L1
10	What is the need for an Isolator in Microwave measurements.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Derive all the wave equations for a TM mode and obtain all the field components in a Rectangular Waveguide.	10M	1	L2
	OR			
12	An air-filled rectangular wave-guide has the dimensions 7*3.5cm. It operates in TE_{10} mode. Calculate i) The cut off frequency ii) phase velocity of wave at 3.5GHz. iii) the guide wavelength at same frequency.	10M	1	L2
13	What is a cavity resonator. Derive an expression for resonant frequency of a cavity resonator.	10M	2	L2
	OR			
14	Explain Faraday Rotation principle. Explain the operation of ferrite Isolator.	10M	2	L2
15	Explain the construction and working of 2- cavity Klystron amplifier using applegate diagram.	10M	3	L2
	OR			
16	Explain the operation of Reflex Klystron with neat diagram.	10M	3	L2

17	How is bunching achieved in a Cavity Magnetron. Explain with the help of the neat sketch.	10M	4	L2
	OR			
18	Explain the construction of GUNN diode using RWH theory.	10M	4	L2
19	Derive the S-Matrix of Magic Tee and discuss its properties.	10M	5	L2
	OR			
20	Draw a neat diagram of microwave test bench and explain about each block along with its features.	10M	5	L2