PRN:		Course Code :	ECE405R1

Final Year **B. Tech** End Semester Examination Winter 2023

Microwave and Radar Systems

Day and Date: Saturday,02.12.2023 Max Marks: **100**

Time :2-5pm Duration: **03** hrs

Instructions: All questions are compulsory.
Sub question 'a)' is compulsory, Solve any two from the remaining

			Marks	Bloom's Level	CO
Q.1		Attempt the following			
	a)	Derive expression for TE wave propagation inside RWG?	06	3	2
	b)	Prove that a perfect TEM wave doesn't exist inside RWG?	07	3	1
	c)	Explain with neat diagram cavity resonators and derive expression for resonant frequency in rectangular resonator.	07	2	2
	d)	Explain different losses in waveguides?	07	1	3
Q.2		Attempt the following			
	a)	Elaborate slotted line and Microstrip line with neat diagram.	06	1	3
	b)	Why EH plane tee is called as Magic tee explain with derivation of scattering matrix.	07	4	4
	c)	Elaborate scattering parameters. Write any four properties of S-matrix.	07	2	2
	d)	With neat diagram explain construction and working of Directional coupler? Write equations for coupling, isolation and directivity.	07	2	1
Q.3		Attempt the following			
	a)	Elaborate with neat diagram construction and working of Two cavity klystron amplifier?	06	2	2
	b)	Elaborate with neat diagram construction and working of Magnetron?	07	2	1
	c)	Elaborate with neat diagram construction and working of Reflex klystron?	07	2	4
	d)	Write a note on FWCFA?	07	2	2
Q.4		Attempt the following			
	a)	Explain PIN diode with neat diagram?	06	2	2
	b)	Elaborate Tunnel diode with neat diagram and working principle.	07	2	3
	c)	Write a note on RWH theory.	07	1	1
	d)	Explain Gunn effect and write a note on Gunn diode?	07	2	4
Q.5		Attempt the following			
	a)	Derive free space radar range equation.	06	3	2
	b)	Write a note on MTI radar system.	07	2	3
	c)	Explain Mono and Bi-static radar systems.	07	2	1
	d)	What is Doppler's effect? How it is useful in Radar systems.	07	1	4

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