Q.P. Code: 16EC425 **R16/SS**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations, Nov/Dec 2019

Microwave Engineering

(ECE)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	A waveguide having dimensions a = 5 cm, b = 2 cm. The signal applied to waveguide is10GHz. Determine the modes that are propagating in the waveguide.	8M
	b	Derive the equation for Resonant frequency in rectangular cavity resonator.	4M
		OR	
2	a	Calculate the cut-off frequency of the following modes in a square waveguide 4 cm × 4 cm TE10, TM11 and TE22.	7M
	b	Discuss in detail about Q factor of cavity Resonator.	5M

UNIT-II

3	a	Derive the S-matrix for E-plane junction.	6M
	b	Explain the principle of Ferrite phase shifter.	6M
		OR	
4	a	Draw a typical directional coupler and define directivity and coupling coefficient.	6M
	b	Explain the coupling mechanism of waveguide.	6M

UNIT-III

5	a	With the help of velocity diagram explain principle of two-cavity Klystron amplifier.	7M
	b	Give the performance specification of Reflex klystron.	5M
		OR	
6	a	Derive the expressions for propagation constant and output power gain of TWT.	7M
	b	Write short notes on wave modes.	5M

UNIT-IV

7	a	What is transferred electron effect?	7M
	b	List the differences between microwave transistor and TED devices.	5M
		OR	
8	a	Explain Two Valley Model Theory.	6M
	b	Write short notes on "TRAPATT diode".	6M

UNIT-V

9	a	Explain about measurement of attenuation using a microwave bench setup.	7M
	b	With the help of a neat sketch, briefly explain the functions of different blocks of a microwave bench.	5M
		OR	
10	a	Two identical directional couplers are placed in a waveguide to sample the incident and the reflected power. The meter readings show that the power level of the reverse coupler is 10dB down from the level of the forward coupler. What is the value of the SWR on the waveguide?	7M
	b	Write short notes on usage of Isolator and its significance in a microwave bench.	5M

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