

CONTINUOUS INTERNAL EVALUATION- 1

Dept:EC	Sem / Div: VI	Sub: Microwaves and Antennas	S Code: 18EC63
Date: 25/05/2021	Time: 9:30-11:00 am	Max Marks: 50	Elective: N
Note: Answer any 2 full questions, choosing one full question from each part.			

Q N	Questions	Marks	RBT	COs
PART A				
1 a	Define voltage standing wave ratio. Derive the relationship between VSWR and reflection co-efficient.	9	L3	CO1
b	A Reflex Klystron is to be operated at 10GHz with dc beam voltage 300V, repeller space 0.1cm for $1 \frac{3}{4}$ modes. Calculate P_{RFmax} and corresponding repeller voltage for a beam current of 20mA.	8	L3	CO1
c	Define the following losses in microwave network in terms of S parameter: i) Insertion loss, ii) Transmission loss, iii) Return loss, iv) Reflection loss	8	L1	CO2
OR				
2 a	Derive an expression of the input reflection coefficient of a two port network with mismatched load.	8	L3	CO2
b	Explain mode of oscillation of a reflex Klystron.	9	L2	CO1
c	A certain transmission line has a characteristic impedance of $75 + j0.01\text{ohm}$ and is terminated in a load impedance of $75 + j50\text{ohm}$. Compute: i) Reflection coefficient ii) The transmission coefficient.	8	L3	CO1
PART B				
3 a	With a neat schematic diagram explain the working of reflex klystron.	8	L2	CO1
b	Derive transmission line equations by the methods of distributed circuit theory.	10	L3	CO1
c	Explain S - matrix representation of multiport network.	7	L2	CO2
OR				
4 a	Explain the properties of S - parameters.	10	L2	CO2
b	Prove that impedance and admittance matrices are symmetrical for a reciprocal network.	8	L3	CO2
c	A transmission line has the following primary constants: $R= 10.4 \text{ ohm/km}$, $L=0.00367 \text{ H/km}$, $G=0.8 \times 10^{-6} \text{ mho/km}$, $C=0.00835 \text{ pF/km}$. Determine the characteristic impedance, attenuation constant, phase constant and propagation constant.	7	L3	CO1