Register Number:……..

KUMARAGURU
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B.E DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Seventh Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U18ECI7204: RF and Microwave Engineering

COURSE OUTCOMES

CO1: Implement and analyze various two port RF networks.
CO2: Design and analyze RF transistor amplifiers.
CO3: Measure and analyze the characteristics of active and passive microwave devices.
CO4: Analyze various Microwave tubes.
CO5: Measure the parameters like VSWR, impedance, frequency, power of microwave sources and Loads.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

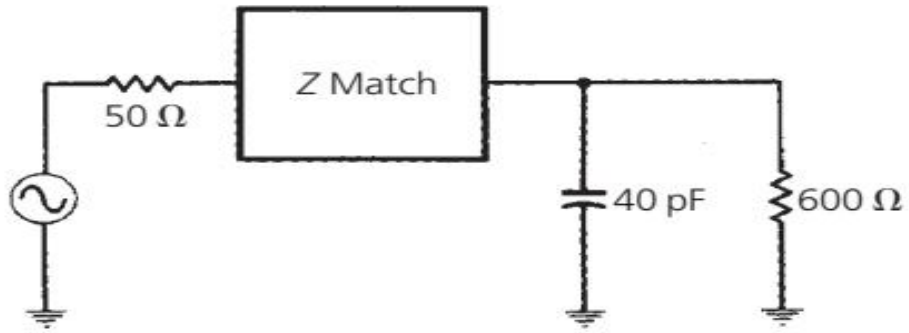
1.	Summarize the properties of S- Matrix.	CO1	[K_2]
2.	When will you say a network is reciprocal.	CO1	[K2]
3.	What is impedance matching and mention its significance.	CO2	[K_2]
4.	List out the distributed elements of a line. Why is it called so?	CO2	[K2]
5.	A matched isolator has an insertion loss of 0.5 dB & isolation of 25 dB. Find the scattering coefficients.	CO3	[K3]
6.	A waveguide termination having VSWR of 1.1 is used to dissipate 100 watts of power. Find the reflected power.	CO3	[K_3]
7.	What do you mean by O-type tubes? Name some O-type tubes.	CO4	[K2]
8.	Give the drawbacks of klystron amplifiers	CO4	[K_2]
9.	Distinguish between Barretter & Thermistor.	CO5	[K_4]
10.	Outline the disadvantages of a single bridge circuit in the power meter.	CO5	[K_2]

Answer any FIVE Questions:-
PART B (5 x 4 = 20 Marks)
(Answer not more than 80 words)

11.	Write short notes on Chip Components and Circuit Board considerations.	CO1	[K_3]
12.	Express in detail the design considerations of an L- Network	CO2	[K_4]
13.	Compare and contrast IMPATT, TRAPATT and BARITT Diodes.	CO3	[K_4]
14.	Mention the classification of microwave tubes and draw a neat diagram of reflex klystron along with its advantages.	CO4	[K3]
15.	Explain in detail about microwave high power measurement with neat sketch.	CO5	[K_2]
16.	With suitable diagram explain the measurement of impedance using reflectometer method.	CO5	[K3]

Answer any FIVE Questions:-
PART C (5 x 12 = 60 Marks)
(Answer not more than 300 words)

17.		Explain in detail the RF behavior of passive components.	12	CO1	[K_3]
18.	a)	Design a circuit to match a 100-ohm source to a 1000-ohm load at 100 MHz Assume that a DC voltage must also be transferred from the source to the load.	6	CO2	[K_4]
	b)	Design an impedance-matching network that will block the flow of DC from the source to the load below. The frequency of operation is 75 MHz. Try the resonant approach.	6	CO2	[K4]



19.		Explain the working principle of the precision variable attenuator and phase shifter in detail with neat sketches.	12	CO3	[K_3]
20.		With neat circuit diagrams and relevant equations, explain the velocity modulation process and bunching in a two cavity klystron amplifier?	12	CO4	[K4]

21.	Draw the experimental setup to find the low & high VSWR & mention the procedure.	12	CO5	[K4]
22.	With neat diagrams and relevant equations, explain about Helix Traveling Wave Tube. Derive amplification process, convection current, axial electric field, wave modes& gain expressions.	12	CO4	[K4]

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