U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E. **Semester: VII**
Branch: Electronics and Communication Engineering **Duration: 3 hrs.**
Course Code: 19EC7PCRFM **Max Marks: 100**
Course: RF and Microwave Engineering **Date: 05.03.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.
3. Use of Smith charts permitted

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - I

1 a) List the IEEE and commercial microwave band designations. **04**

b) Bring out the low RF circuit design considerations. **08**

c) Find the input impedance of a transmission line($Z_o = 50\Omega$) that has a length of $\frac{\lambda}{8}$ and is connected to a load of impedance of $Z_L = 50 + j50\Omega$? **08**

OR

2 a) Why are transmission lines called distributed parameter networks. **04**

b) Bring out the design steps involved in high RF and MW circuit design. **08**

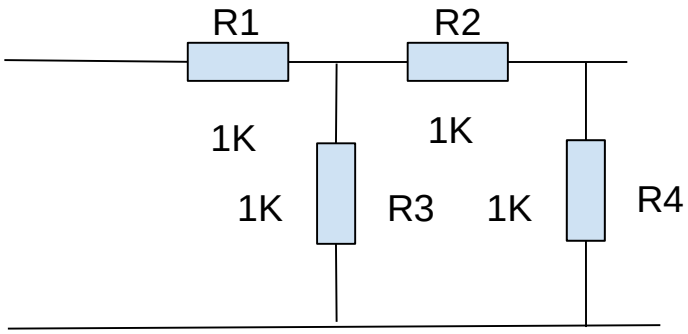
c) What is the impedance Z_D of a device having $\Gamma_D = 2.23\angle 26.5^o$? $Assume\ Z_o = 50\Omega$. **08**

UNIT - II

3 a) Explain the following for a two port network: S parameter, Z parameter, Y parameter. **06**

b) What are the properties of S matrix? Derive the reciprocity property of S-Matrix? **08**

c) Obtain the S parameter for this network. **06**



UNIT - III

4 a) Derive the S matrix of E plane Tee junction. $2.23\angle 26.5^o$ **06**

	b)	Define the characteristics of a directional coupler. Obtain the equations for them.	**08**
	c)	A 20mW signal is fed into one of the collinear port1 of a lossless H plane Tee junction. Calculate the power delivered through each port, when others are terminated in matched load.	**06**

OR

5	a)	Derive the S matrix of Magic Tee.	**08**
	b)	Explain how impedance matching is done using tuning screws.	**04**
	c)	Draw the following waveguide discontinuities: Iris, waveguide, E- plane Bend, H plane bend, Corner and mention their application.	**08**

UNIT - IV

6	a)	What are transfer electron devices? Explain their operation.	**08**
	b)	Demonstrate how PIN diodes are used as RF Switches.	**06**
	c)	Explain the working of IMPATT diode with neat diagrams.	**06**

UNIT - V

7	a)	Mention few applications of Microwaves in the medical field.	**05**
	b)	Differentiate between EMC and EMI.	**08**
	c)	Explain the fabrication of MMICs.	**07**

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