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

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary 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: 20.09.2023**

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 chart permitted.

UNIT - I

1. a) Compare Low RF and high RF circuits. **05**

   b) Highlight the characteristics of RF signals Vs Low AC/DC signals. **05**

   c) A lossless transmission line of length 100m has characteristic impedance 100Ω. It is terminated by a load impedance (100-j200)Ω. The operating frequency is10MHz. Analyze to find the line impedance and admittance at 25m from the load end. **10**

OR

2. a) Draw the RF spectrum bands. **04**

   b) A lossless transmission line of characteristic impedance50Ω is terminated in a load impedance Z_L. The Voltage standing wave maximum and minimum are measured as 2.5V and 1V respectively and the distance between successive minima is 5cm. The line is first terminated by a short circuit and then by the load Z_L so that the shift in voltage minima is 1.25cm towards the generator. Analyze and find the value of Z_L. **10**

   c) List and explain the effects of RF/MW signals in a circuit which are not present at DC or low AC. **06**

UNIT - II

3. a) Prove that Z and Y matrices are symmetrical for a Reciprocal network. **08**

   b) Derive the Properties of S Parameters. **12**

UNIT - III

4. a) Draw the structure of an E plane Tee and obtain its S-matrix. **10**

b) In a H plane T Junction, Compute Power delivered to the loads 40Ω and 60Ω connected to arms 1 and 2 when 10mW power is delivered to port3. **10**

OR

5. a) Explain construction, working and application of a Faraday rotation isolator with neat diagram. Write the S-matrix of a lossless matched isolator. **10**

b) Draw and explain the characteristics of Magic Tee. Obtain its S-matrix. Explain any one application of Magic Tee **10**

UNIT - IV

6. a) Draw the V-I characteristics of Gunn Diode and explain the various modes of operation. **12**

b) Explain the following ATTDs with respect to the mechanism of oscillation. **08**

1. IMPATT
2. TRAPATT

UNIT - V

7. a) What is meant by EMI/EMC? Why is it gaining importance these days? **10**

b) Explain the applications of Microwaves in Imaging. **10**

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