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M.TECH

Total Number of Pages : 1

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2018

RF AND MICROWAVE CIRCUIT DESIGN

Branch: EC, Subject Code: MECPE1042

(Regulations 2018)

Time: 3 Hours

Max Marks : 70

Question Code:RD18002091

PART-A (10 X 2=20 Marks)

1. Answer the following questions.
 - a. What is reflection coefficient? What is its range?
 - b. How standing waves are produced in transmission line
 - c. Draw the diagrams of rectangular and circular waveguide with its parameters
 - d. What are Telegraphers Equations ?
 - e. What are the minimum and maximum values of the standing wave ratio ?
 - f. Define conduction loss
 - g. What are the application of smith chart?
 - h. Define insertion loss .
 - i. Determine the disc diameter of a strip resonator resonates at 5.2GHz and uses alumina having relative permittivity 9.8 as the dielectric substrate.
 - j. A 5dB attenuator is specified as having a VSWR of 1.2 .Assuming that it is reciprocal , find its S-Matrix ?

PART-B (5 X 10=50 Marks)

Answer any five questions from the following.

- 2.a) Briefly explain about isolator with faradays rotation concept . [5]
b) Briefly explain about circulator with proper diagram . [5]
- 3.a)Discuss about Tee Junctions and Hybrids . [5]
b) Discuss with proper diagram about open circuit and short circuit transmission line. Derive all its parameters. [5]
- 4.a)Write short notes on Gunn Diode and Attenuator . [5]
b)What is standing wave? What are the parameters associated with it ? How it is produced? [5]
- 5.a)Derive the expression for voltage and current in a two wire parallel transmission line . [5]
b)What is power handling capability of the rectangular waveguide? [5]
- 6.a)Differentiate between single stub matching and double stub matching . [5]
b) Derive the expression for the frequency response of a quarter wave transformer . [5]
- 7.a)Derive the expression for input impedance of a terminated transmission line. Find out the equation short circuited transmission line. [5]
b) A lossless transmission line has inductance equals to $100\mu\text{H}$ and capacitance equals to 50pF . [5]
Find out the characteristic impedance, phase constant and phase velocity if the length of the transmission line is 200 m and operating frequency 0.2GHz.
- 8.a) Explain about coupling and tuning of microwave resonator. [5]
b) Explain about strip/Disc Resonator with suitable diagram. [5]

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