C

Question Paper Code: 55402A

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

Fifth Semester

Electronics and Communication Engineering

15UEC502 - TRANSMISSION LINES AND WAVEGUIDES

(Regulation 2015)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. One Neper is equal to   CO1- R

   (a) 9.686 db   (b) 8.686 db   (c) 7.686   (d) 8.565

2. A line of finite length, terminated in a load equivalent to its   CO2-R
   characteristic impedance, appears to sending end generator as

   (a) Infinite line   (b) Finite line

   (c) Finite line with fixed value   (d) None of the above

3. Give the minimum and maximum value of reflection co-efficient   CO3-R

   (a) 1<K<10.5   (b) 1<k<α   (c) 0<K< α   (d) 0<k<1

4. There is no electric field can exist in the direction of the magnetic   CO4-R
   field such a wave is said to be

   (a) TE wave   (b) TM wave   (c) TEM wave   (d) Quasi TM wave

5. The frequency at which the wave motion ceases   CO5-R

   (a) Flat Line   (b) Zero frequency

   (c) Attenuation frequency   (d) Cut-off frequency

PART – B (5 x 3= 15 Marks)

6. What is symmetrical Network?   CO1- U

7. How are practical lines made appear as infinite line?   CO2- U

8. Give the name of circles on smith chart.   CO3- U

9. What is the use of attenuators?   CO4- U

10. What is cavity resonantors?.   CO5- U

<div align="center">PART – C (5 x 16= 80Marks)</div>

11. (a) Design an m derived LPF having cut off frequency= 1 KHz.   CO1- App   (16)
        Design impedance of 400Ω and resonant frequency 1100 Hz.

<div align="center">Or</div>

    (b) Explain the properties of symmetrical network with relevant   CO1- U   (16)
        equations

12. (a) Explain the concept of transmission line as cascaded T section   CO2- U   (16)
        with mathematical expression.

<div align="center">Or</div>

    (b) Describe input impedance of open and short circuited lines, and   CO2- U   (16)
        plot the variation of input impedance of dissipation line as a
        function of length for open and short line.

13. (a) Derive the expression for voltage and currents on dissipation less   CO3- U   (16)
        line along with line constant for zero dissipation.

<div align="center">Or</div>

    (b) A 50 ohms transmission line is connected to a cellular phone   CO3- U   (16)
        antenna with load impedance ZL=25-j50 ohm. Find the location
        and length of the short circuited stub required to match with 50
        ohms.

14. (a) Explain the behavior of electromagnetic waves between parallel   CO4- U   (16)
        planes using maxwell's equation.

<div align="center">Or</div>

    (b) Explain the characteristic impedance of different Modes in   CO4- U   (16)
        Parallel planes

15. (a) Derive the expression for TM waves in rectangular waveguides.   CO5- U   (16)

<div align="center">Or</div>

    (b) (i) Describe cavity resonator.   CO5- U   (8)
        (ii) Deduce the expression for resonant frequency of the   CO5- U   (8)
        rectangular cavity resonator for any given mode.

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