No. of Printed Pages : 4 181035

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3rd Sem / Eltx

Subject:- Network Filters and Transmission Lines

Time : 3Hrs. M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 If an asymmetrical network is terminated by an impedance such that its input impedance is equal to its terminating impedance, then such impedance is called: (CO1)

a) Source impedance b) Load impedance
c) Iterative impedance d) Image impedance

Q.2 Attenuation in any symmetrical attenuator is given by (CO3)

a) $a = 20 \text{Log} \sqrt{\frac{I_1 R_1}{I_2 R_2}}$ b) $a = 20 \text{Log} \sqrt{\frac{I_1}{I_2}}$

c) $a = 20 \text{Log} \frac{I_1}{I_2}$ d) $a = 10 \text{Log} \frac{I_1}{I_2}$

Q.3 An attenuator consist of (CO3)

a) Only resistors
b) Only capacitors
c) Only inductors
d) Both resistor and inductors

Q.4 In a prototype high pass filter p- section, characteristics impedance is maximum at which frequency? (CO5)

a) Zero b) f_c
c) $1.5f_c$ d) Infinity

Q.5 A filter having two inductor in series arm and a capacitor in shunt arm is a (CO5)

a) LPF b) HPF
c) BPF d) BSF

Q.6 In a m-derived terminating half section value of m is (CO5)

a) 0 b) 0.3
c) 0.6 d) 0.9

Q.7 Reflection coefficient of a line terminated in its characteristic impedance is (CO7)

a) -1 b) 0
c) 1 d) Infinity

Q.8 A finite length transmission line behaves as infinite long line when the load end is (CO7)

a) Open circuited
b) Short circuited
c) Terminated by its characteristic impedance
d) Terminated by an impedance other than characteristic impedance

Q.9 For a short circuited line load current maxima occurs at (CO7)

a) Load
b) Source
c) At midpoint of load and source
d) At any point between load and source

Q.10 If k=0, then VSWR will be (CO7)

a) 0 b) 1
c) -1 d) Infinity

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Draw a symmetrical lattice network (CO1)

Q.12 Define short circuit impedance (CO1)

Q.13 Define iterative transfer constant (CO1)

Q.14 Define image impedance (CO1)

Q.15 1 Neper = _____ dB. (CO2)

Q.16 L-Type attenuator is a form of symmetrical attenuator (True/False) (CO3)

Q.17 Draw a m-derived T-section low pass filter (CO5)

Q.18 Condition for a distortion less line is_____ (CO7)

Q.19 Draw the equivalent circuit of a transmission line (CO7)

Q.20 Distance between successive voltage maxima is _____ (CO7)

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Differentiate between unilateral and bilateral network. (CO1)

Q.22 Explain propagation constant of a symmetrical network. (CO1)

Q.23 Explain briefly insertion loss. (CO1)

Q.24 Obtain a half section by splitting a T-network.(CO1)

Q.25 Distinguish between balanced and unbalanced attenuator. (CO3)

Q.26 List five applications of attenuators. (CO3)

Q.27 List two disadvantages of prototype filter (CO2)

Q.28 Compare active and passive filters (CO4)

Q.29 Design a constant-k low pass filter p section having cutoff frequency 3KHZ and characteristics impedance 600Ω. (CO5)

Q.30 Explain the construction and working of double crystal BPF. (CO8)

Q.31 Explain briefly the secondary constant of a transmission line. (CO7)

Q.32 Explain the causes of distortion in a transmission line. How can this be minimized (CO7)

Q.33 Explain stub matching (CO7)

Q.34 List two advantages and two disadvantages of HVDC (CO9)

Q.35 Give five applications of transmission line (CO7)

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Design a p- type attenuator to give 20 dB attenuation, having a characteristics impedance of 100 Ω (CO3)

Q.37 Explain the need of Filters, with a neat gain vs freq plot explain the working of a high pass filter. Draw a T-section of m-derived high pass filter. (CO6)

Q.38 Explain the concept of reflection and formation of standing waves in a transmission line. Draw the standing wave pattern for a short circuit line (CO7)