



**NAVRACHANA
UNIVERSITY**

a UGC recognized University

School: School of Engineering and Technology
Program/s: Electrical & Electronics Engineering
Year: 2nd **Semester:** 3rd
Examination: End Semester Examination
Examination year: December - 2021

Course Code: EE235 **Course Name:** Network Theory
Date: 09/12/2021
Time: 8:30 am to 10:30 pm

Total Marks: 40
Total Pages: 1

Instructions:

- Write each answer on a new page.
- Use of a calculator is permitted/not permitted.
- * COs=Course Outcome mapping. # BTL=Bloom's Taxonomy Level mapping

Que. A Attempt any Five.

- | | Marks | COs* | BTL# |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------|-----------------------------|
| Q.1 Prove that for T-type constant band pass filters resonant frequency is $f_0 = \sqrt{f_1 f_2}$. | 8 | CO7,
CO8 | BT1,
BT2,
BT3, |
| Q.2 Derive design equation for L-type attenuator when L-shape faces the output terminals. Also determine parameters of the same network when image impedance is 500Ω & attenuation is 10db. | 8 | CO9,
CO10 | BT1,
BT2,
BT4,
BT5 |
| Q.3 Derive design equation for symmetrical lattice network in terms of characteristics resistance & attenuation constant (in neper). Also derive relation between neper and db for attenuation. | 8 | CO10,
CO11 | BT1,
BT2,
BT3,
BT4 |
| Q.4 Design a low-pass constant-k type T-section filter with $f_c = 3\text{KHz}$ and nominal characteristic impedance 500Ω . Also determine the frequency at which the filter offers attenuation of 20dbs. Determine β for $f = 2\text{KHz}$ and $f = 10\text{KHz}$. | 8 | CO7,
CO8 | BT1,
BT2,
BT3,
BT4 |
| Q.5 For the network shown in figure 1 , below compute V_2/V_1 . | 8 | CO1,
CO2,
CO3 | BT1,
BT2,
BT4,
BT5 |
| <p style="text-align: right;">Fig.1</p> | | | |
| Q.6 Define cut-set and tie-set matrix for a graph. Draw Cut-set Matrix and Tie-set matrix of graph as shown in Figure 2 . (consider branches 1,2,3,6 as tree branches). | 8 | CO4,
CO5, | BT1,
BT2,
BT4,
BT5 |
| <p style="text-align: right;">Fig.2</p> | | | |
| Q.7 Derive the ABCD parameters in terms of Y and h-parameters. | 8 | CO1,
CO2,
CO3 | BT1,
BT2,
BT4,
BT5 |