

Code No.: EC401PC

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CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS

II-B.TECH-II-Semester End Examinations (Regular) - August- 2023
NETWORK ANALYSIS AND TRANSMISSION LINES

(ECE)

[Time: 3 Hours]

[Max. Marks: 70]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

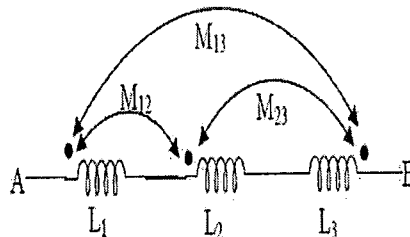
(20 Marks)

1. a) Define Tie-set and cut-set. [2M]
- b) Explain Passive elements in detail. [2M]
- c) What is resonance? Explain. [2M]
- d) Draw a series and parallel RLC circuit. [2M]
- e) Write the H- parameter equations. [2M]
- f) Draw the equivalent circuit of Z-parameters. [2M]
- g) Define Characteristic impedance? [2M]
- h) Write the condition for a distortion less line? [2M]
- i) Find the VSWR and reflection co-efficient of a perfectly matched line with no Reflection from load? [2M]
- j) Define Standing wave ratio. [2M]

PART-B

(50 Marks)

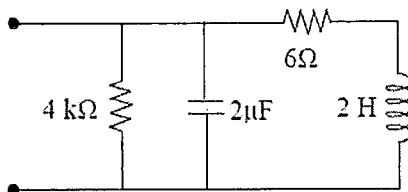
2. a) Clearly explain the following: [5M]
 - i. Self-inductance (L)
 - ii. Mutual inductance (M)
 - b) What is an electric circuit? What is a magnetic circuit? Make a comparison between electric circuit and magnetic circuit [5M]
- OR**
3. a) Two identical coupled coils have an equivalent inductance of 80mH when connected series aiding and 35 mH in series opposing. Find L1, L2, M and K [5M]
 - b) Write the expression for total inductance of the three series connected coupled coils connected between A and B shown in Figure [5M]



4. a) A series RLC circuit has $R=10\Omega$, $L=0.5H$ and $C=40\mu F$. The applied voltage is 100V. Find Resonant frequency & Quality factor of a coil [5M]
 b) R-C series circuit is suddenly excited from a step voltage V. Derive an expression for the current as a function of time and draw the graph current Vs Time. [5M]

OR

5. a) Given a series RLC circuit with $R = 10$ ohms, $L = 1$ mH and $C = 1 \mu F$ is connected across a sinusoidal source of 20 V with variable frequency. Find: [5M]
 i. The resonant frequency
 ii. Q factor of the circuit at resonant frequency
 iii. Half power frequencies
 b) For the network shown in the Figure, determine (i) Resonance frequency (ii) input admittance at resonance (iii) quality factor (iv) band width. [5M]



6. a) The Z-parameters of a two-port network are $Z_{11}= 10\Omega$, $Z_{22}= 15\Omega$, $Z_{12}= 5\Omega$ and $Z_{21}= 5\Omega$. Find the equivalent T-network and ABCD parameters. [5M]
 b) Write the conditions of Reciprocity and symmetry of Z, Y and ABCD-parameters. [5M]

OR

7. Write the H and ABCD-parameters of the following network in Figure-1: [10M]

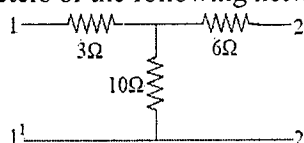


Figure:1

8. a) Define a transmission line and explain different types of transmission lines with neat sketches. [5M]
 b) What are the different types of loadings in transmission line? [5M]

OR

9. a) What are the primary and secondary constants of transmission line? [5M]
 b) Draw the equivalent circuit of transmission line. [5M]
 10.a) Write the applications of Smith Chart for transmission lines. [5M]
 b) Define the term reflection and derive reflection coefficient in terms of Z_R and Z_0 [5M]

OR

11. Evaluate input impedance of $\lambda/2$, $\lambda/4$, $\lambda/8$ lines. [10M]
