



II B.Tech I Sem Supplementary Examination, July-2022

Network Analysis and Transmission Lines

(ECE)

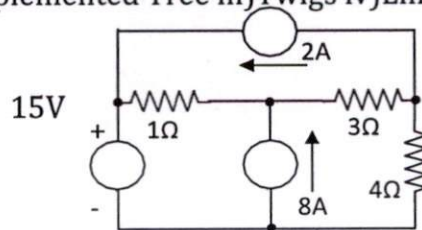
Time: 3 Hours.**Max. Marks: 70**

Note: 1. Answer any FIVE questions.

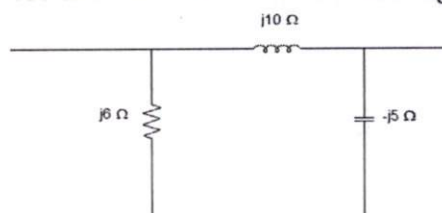
2. Each question carries 14 marks and may have a, b as sub questions.

- 1 a) Define the self inductance, mutual inductance and co-efficient of coupling in a coupled circuit with neat sketch? 7M CO1 BL1
 b) Explain the **DOT** convention in magnetically coupled circuits? 7M CO1 BL5
 And Determine the L_1 , L_2 , M and K in two identical coupled coils have an equivalent inductance of 80 mH when connected series aiding and 35 mH in series opposing.

- 2 Explain the definition of Graph with example? 14M CO1 BL2
 Define the following terms with the given electric network
 ii) Tree iii) Complemented Tree iii) Twigs iv) Links



- 3 a) Explain the terms bandwidth, Quality factor, and selectivity curve in a series resonant circuit 7M CO2 BL2
 b) Given a series RLC circuit with $R = 100$ ohms, $L = 0.5$ H and $C = 40$ μ F, Determine the resonant, lower and upper half - power frequencies 7M CO2 BL5
- 4 What is time constant? Explain time constant in case of series RL and series RC 14M CO2 BL5
- 5 a) Evaluate the transfer function $G_{12}(S) = V_2(s)/V_1(s)$ for the network shown in the figure 7M CO3 BL5



- b) Explain the image and iterative impedance, network function, driving point and transfer functions - using transformed (S) variables. 7M CO3 BL2

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|---|--|-----|-----|-----|
| 6 | The z-parameters of a certain two port network are $Z_{11} = 5 \Omega$, $Z_{12} = Z_{21} = 3 \Omega$ and $Z_{22} = 4 \Omega$. Determine its y-parameters, transmission parameters, and hybrid parameters (h) ? | 14M | C03 | BL5 |
| 7 | a) Determine the characteristic impedance for the following line parameters $R = 10.4 \text{ ohms /km}$ $L = 0.00367 \text{ H/km}$ $C = 0.00835 \mu\text{f /km}$ $G = 10.8 \times 10^{-6} \text{ mhos /km}$ | 7M | C04 | BL5 |
| | b) Define the following terms | 7M | C04 | BL2 |
| | a) Group velocity | | | |
| | b) Patch loading | | | |
| | c) Frequency distortion | | | |
| | d) Phase distortion | | | |
| 8 | Explain the properties of $\lambda/4$, $\lambda/2$, $\lambda/8$ Lines and mention application of each line? | 14M | C05 | BL5 |

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