II B. Tech I Semester Supplementary Examinations, October/November - 2020
NETWORK ANALYSIS
(Com to ECE, EIE and ECC)

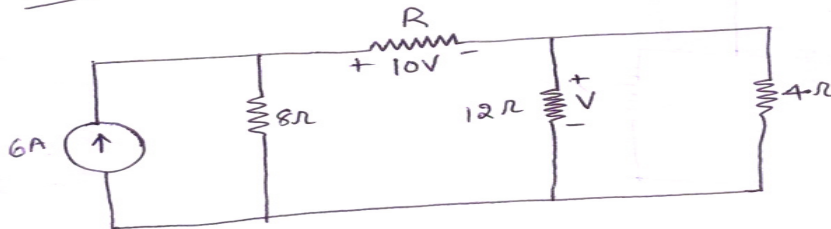Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
         2. Answer **ALL** the question in **Part-A**
         3. Answer any **FOUR** Questions from **Part-B**
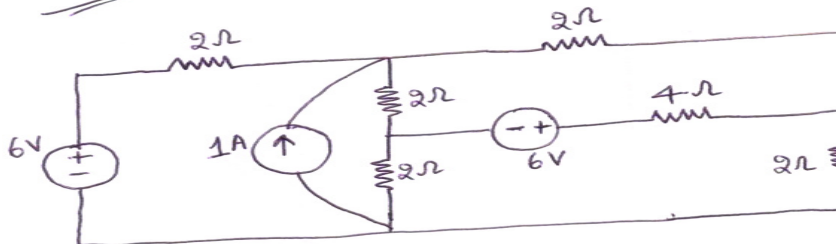~~~~~~

PART –A

1. a) A given conductor has a resistance of 2Ω. What is the resistance of another conductor of the same material, which has one – half the diameter and three times the length of the given conductor   (3M)

    b) Define the term Form factor along with its usefulness   (2M)

    c) Explain the phenomena of resonance in electric circuits   (2M)

    d) State the Tellegen's theorem   (3M)

    e) Distinguish between Symmetrical and Asymmetrical Networks   (2M)

    f) Why Laplace transform method is superior to classical method   (2M)

PART -B

2. a) State and explain Kirchhoff's Laws   (7M)

    b) Find the value of resistance "R" and voltage across 12Ω for the network shown below: (7M)
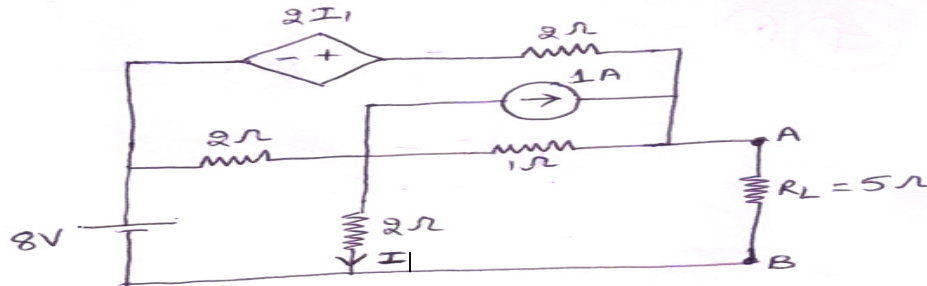

3. a) Distinguish between the Planar and Non-planar Graphs w.r.t Graph Theory   (5M)

    b) Determine the current through the 4Ω resistor branch of the given network.   (9M)

4. a) Derive the equation for Equivalent inductance, when two inductors are coupled in series aiding and mutual inductance exists between them   (5M)

    b) A choke coil(R –L) is connected in series with a 25 µF capacitor. This series combination is connected across a supply voltage of 230V. the circuit draws 55A when the resonance frequency is 50 Hz. Calculate i)the resistance and inductance of the coil, and ii) the voltage across the capacitor   (9M)

5.   Determine the current through the load resistance $R_L = 5\Omega$ across the terminals   (14M)
      A-B of the circuit shown in figure, using thevenin's theorem. Find also the
      maximum power transfer to the resistance R_L

6. a) Explain the interrelationships between Z-parameters in terms of Y-parameters   (7M)
        for a two port network
    b) Compute the transmission parameters for the two port network if the Z-   (7M)
        parameters for the network are $Z_{11} = 42\Omega$, $Z_{22} = 35\Omega$, $Z_{12} = Z_{21} = 25\Omega$.

7. a) State and explain Initial Value and Final value theorem   (7M)

    b) Determine the initial and final values of the current where   (7M)

$$I(s) = \frac{0.42}{s(s^2 + 0.35s + 0.816)}$$

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