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BEI1307

Networks and Lines (New) (1100)

P. Pages : 3

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

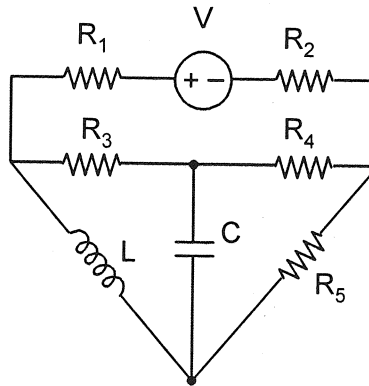
1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. Assume suitable data if necessary.
6. Use of non programmable calculator is allowed.
7. Black figures to the right indicate full marks.

UNIT - I

1. Attempt any two.

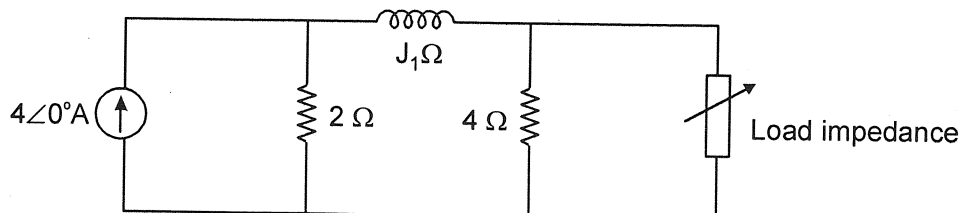
- a) Define Duals and principle of Duality. Draw the dual network of the network shown below.

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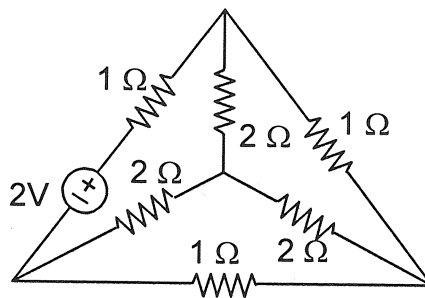
- b) State maximum power transfer theorem in case of complex load and Determine the load impedance required to be connected in the network given below for maximum power transfer. Also calculate maximum power drawn.

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- c) For the network shown below write down the tie set matrix and obtain the network equilibrium equations in matrix form using KVL - calculate the loop currents and branch currents.

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UNIT - II

2. Attempt any two.

- a) Obtain the expression for Bandwidth in case of R-L-C series resonance circuit.
- b) Define ideal transformer and its characteristics. What is the application of ideal transformer in electronic circuit? Define coupling coefficient & obtain its expression.
- c) A constant voltage at a frequency of 1MHz is applied to an inductor in series with a variable capacitor. When the capacitor is set to 500pf. The current has its maximum value, when it is reduced to one half when the capacitor is 600pf. Find resistance, inductance & Q factor of the inductance.

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UNIT - III

3. Attempt any two.

- a) Explain with a neat diagram how L sections of the reactance is useful to match a low generator resistance to high load resistance.
- b) Design suitable matching half sections to match a symmetrical T section having $Z_{OT} = (500 + j0)\Omega$ to a symmetrical π section having $Z_{O\pi} = (400 + j0)\Omega$.
- c) A transmission line has the following parameters at 1KHz frequency $R = 6\Omega/\text{km}$, $L = 2\text{mH}/\text{km}$, $C = 0.005\mu\text{f}/\text{km}$, $G = 0.5\mu\text{mho}/\text{km}$. Calculate Z_0 , α , β , λ & phase velocity.

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UNIT - IV

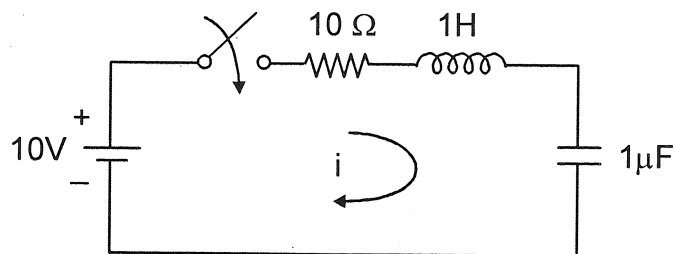
4. Attempt any two.

- Design m derived T type low pass filter to work into load of 500 ohm and cut off frequency at 4KHz and peak attenuation at 4.5KHz. 10
- List the drawbacks of prototype filter & m derived filter. 10
- Design symmetrical T and π attenuator with 20dB attenuation and 600 ohm design impedance. 10

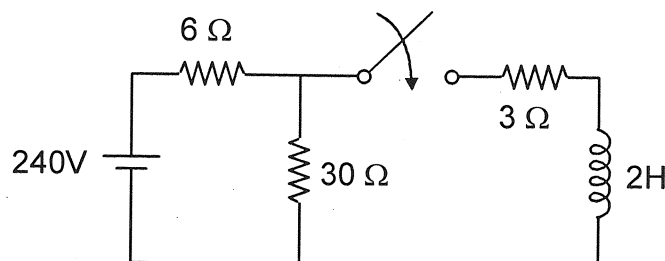
UNIT - V

5. Attempt any two.

- In the following network the switch is closed. Assuming all initial conditions as zero find i , $\frac{di}{dt}$ & $\frac{d^2i}{dt^2}$ at $t = 0^+$ 10



- The switch in below figure is open for a long time & closes at $t = 0$. Determine $i(t)$ for $t > 0$. 10



- Explain the step response in case of R - L series circuit. 10
