[Total no. of Questions:09]　　　　　　　　　　　　　　　　[Total No. of Pages:02]
Uni. Roll No. ....

B.Tech (Batch 2018 onwards)
Sem.-3rd
ELECTRICAL CIRCUIT ANALYSIS
SUBJECT CODE: PCEE-101
PAPER ID:　16064

**Time: 03 Hours**　　　　　　　　　　　　　　　　　　**Maximum Marks:60**
Instructions to Candidates
1) Parts A and B are **Compulsory**
2) Part C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice.
3) Any missing data may be assumed appropriately

　　　　　　　　　　　　　　　Part-A　　　　　　　　　　　　**[Marks:02 each]**

Q1.

　　a) What is duality?
　　b) Define transient state response.
　　c) Define admittance.
　　d) Define convolution integral.
　　e) Obtain Laplace transform of $f(t)= 1-e^{-at}$, a being a constant.
　　f) Find Z parameters for network shown:
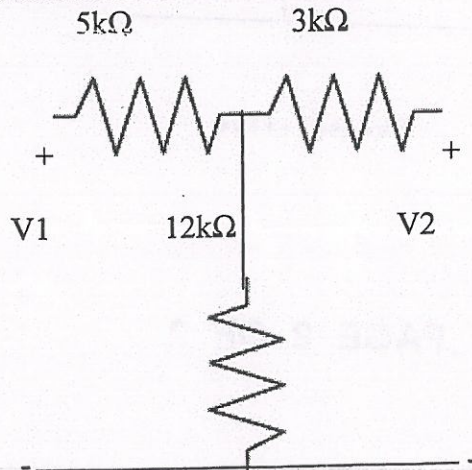
　　　　　　　　　　　　　　　Part-B　　　　　　　　　　　　**[Marks:04 each]**

Q2. State and prove reciprocity theorem.
Q3. What is an ideal transformer? Draw its phasor diagram.
Q4. What is a transfer function & what is its importance? What are poles and zeros of a transfer function?
Q5. An impedance of $(3+j5)\Omega$ is connected across a 10V, 50Hz source. Find i) Power factor (ii) Real and reactive power (iii) Current drawn by impedance.
Q6. Find the current through the 2Ω resistor using Norton's theorem. Verify the result by Thevenin's theorem.
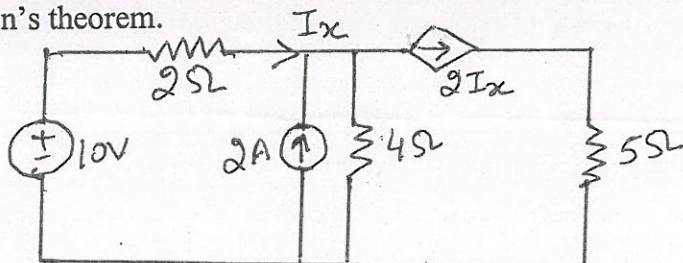
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Q7. Distinguish between Series and parallel resonance for AC circuits.

Part C   [Marks: 12 each]

Q8. State and prove maximum power transfer theorem for AC circuits.

OR

What is a) Superposition Theorem b) Compensation Theorem c) Mesh Analysis.

Q9. Realise the function

$$Z(s)= \frac{s(s^2+10)}{(s^2+4)(s^2+16)}$$

in both the Foster first and second forms.

OR

Find the current ratio (I_1/I_2) in the given circuit. Also find Y parameters.

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