

Code No: 09A30204

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech II Year I Semester Examinations, November/December-2013

Electric Circuits

(Common to ECE, ETM)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Explain in detail the volt-ampere relationship of R, L and C elements with neat diagrams.
b) What is meant by independent and dependent sources? Give examples.
c) Find the equivalent voltage source across a, b terminals of the following Figure 1. [15]

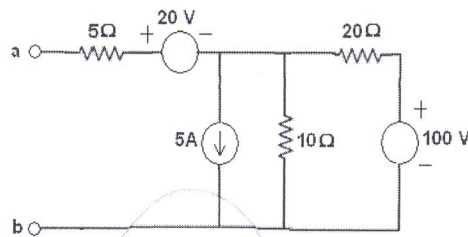


Figure: 1

- 2.a) State and explain Kirchoff's laws.
b) Find the equivalent resistance across the terminals A-B as shown in Figure 2. [15]

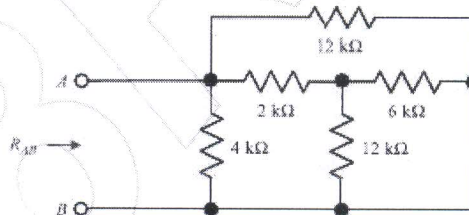


Figure: 2

- 3.a) Illustrate following terms:
i) Impedance
ii) Reactance
iii) Phase deference
iv) Power factor.
b) A circuit consists of a resistance of 15Ω , a capacitance of $200\ \mu\text{F}$ and inductor of 0.05H all in series. If supply of 230V , 50Hz is applied to the ends of circuit. Calculate
i) Current in the coil
ii) Potential difference across each element
iii) Frequency at which current would have unity power factor. [15]
- 4.a) Obtain the current locus of a fixed resistance and a variable capacitance when connected with voltage of variable frequency.
b) Given a series RLC circuit with $R = 10\ \text{ohms}$, $L = 1\ \text{mH}$ and $C = 1\ \mu\text{F}$ is connected across a sinusoidal source of $20\ \text{V}$ with variable frequency. Find
i) The resonant frequency
ii) Q factor of the circuit at resonant frequency
iii) Half power frequencies. [15]