

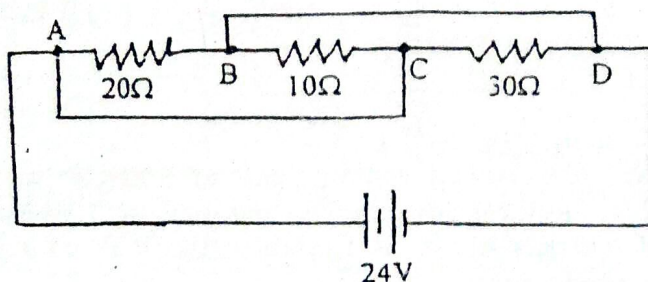
Exam.	7th Nov 2016 (2016 & 2017 Batch)		
Level	BE	Full Marks	80
Programme	BCE, BME	Pass Marks	32
Year / Part	I / II	Time	3 hrs.

Subject: - Basic Electrical Engineering

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt any Five questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

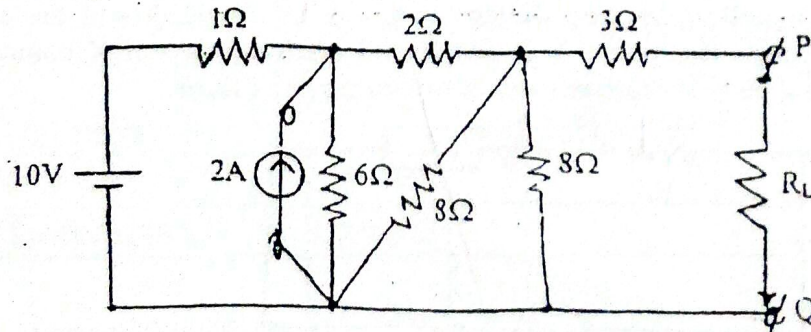
1. a) What are ideal and practical voltage and current sources? Explain, how can we convert a voltage source into a current source and current source into a voltage source? [6]

b) For the circuit shown below, calculate the power consumed by the 10Ω resistor. [4]

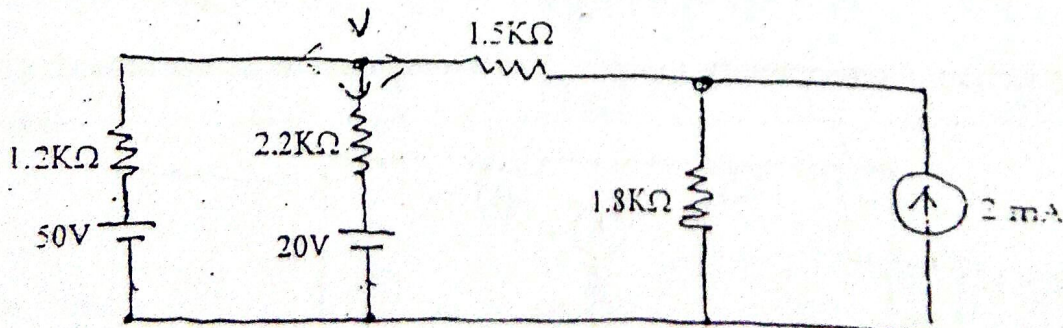


c) Explain and write the equations for Delta-Star conversion and Star-Delta conversion. [6]

2. a) Using maximum power transfer theorem, find the value of R_L connected between terminals P and Q so that maximum power is developed across R_L . Find the value of maximum power also. [8]



b) Using nodal analysis, determine the current that flows through $1.5K\Omega$ resistor. [8]



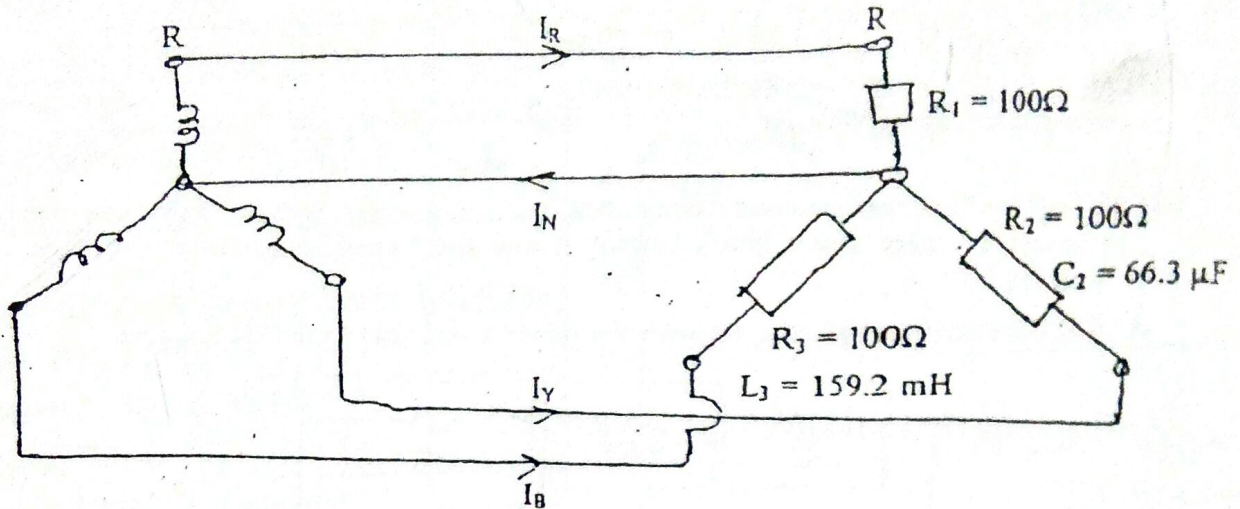
3. Describe capacitance from circuit view point, and geometric view point. [4]

4. Four capacitors with values $100\mu F$, $50\mu F$, $25\mu F$ and $10\mu F$ are connected in series to a 25V supply. Calculate the total capacitance, the voltage across each capacitor, and the

3) A sinusoidal source of $e = 170 \sin 377t$ is applied to an RL circuit. It is found that the circuit absorbs 720 watt when an effective current of 12A flows. [8]

- Find the power factor of the circuit
- Compute the value of the impedance
- Calculate the inductance of the circuit in Henry

4. a) In the circuit below, the generator phase voltage is $V_{ph} = 200V$ and its frequency is 60 Hz. Calculate the three line currents and the neutral current. [8]

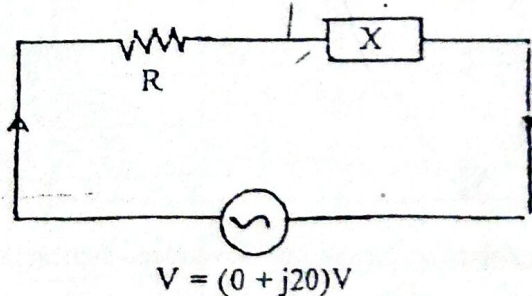


b) A 3 phase cable supplies a balanced lighting load of 200KW and motor load of 1000KW at a P.F. of 0.71 lagging connected in parallel. A 3 phase star connected capacitor bank rated of 600 KVAR is used to raise the P.F. of the resultant load. Calculate the P.F. of the whole combination. [8]

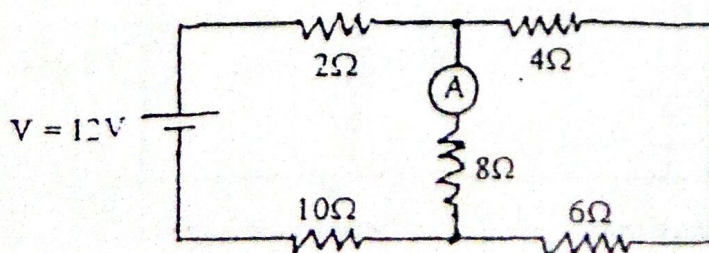
- Without the capacitor bank
- With the capacitor bank

5. a) Define the following terms with phasor and wave form. (i) lagging (ii) leading (iii) in phase. How would you calculate the RMS value of a waveform? [8]

b) In the circuit shown below applied voltage is given by $(0+j20)$ and the current is $(0.8+j5)$ amp. Determine the value of R and X and also indicate if X is inductive or capacitive. Also draw phasor diagram and calculate power factor. [8]



6. a) State and explain the reciprocity theorem. Verify the theorem in the network given below. [9]



b) How power can be measured in three phase system by two watt meters method? Explain with the help of circuit diagram as well as phasor diagram. [8]