

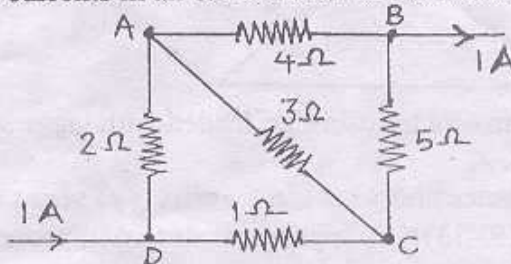
1. Question No.1 is compulsory and solves any four remaining six questions. In all attempt five questions.
2. Figures to the right indicate full marks.
3. Assume data if necessary and give justification.

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1. Attempt any five

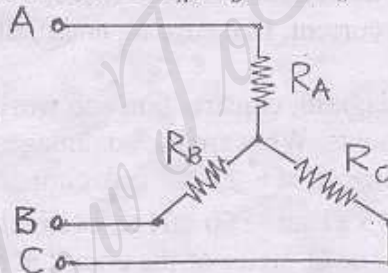
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(a) Find the currents in all branches of the network shown :

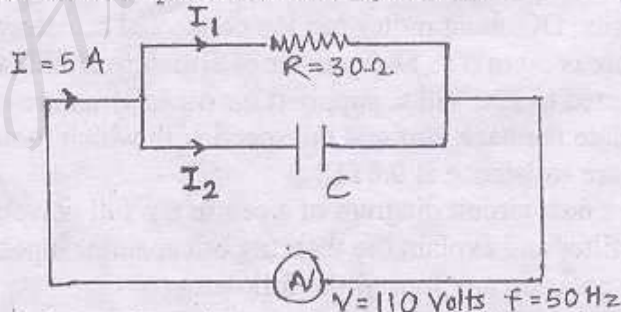


- (b) Why single phase induction motors are not self starting?
- (c) What are the losses in transformer? How to minimize these losses?
- (d) Draw the SCR characteristics and explain the parameters on it.
- (e) Which elements are used in filter circuit and why?
- (f) Consider the star network shown below:

The resistance between terminals A and B with C open is 6Ω , between B and C with A open is 11Ω and between terminals C and A with B open is 9Ω then, Find the values of R_A , R_B and R_C



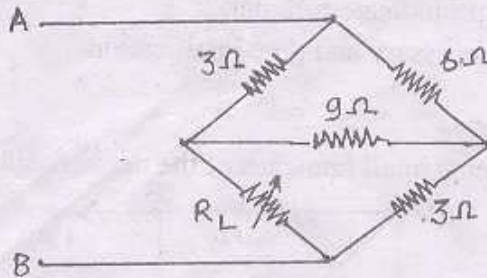
(j) Find the branch current I_2 in the following circuit.



2. (a) A current of 5A flows through a non-inductive resistance in series with a coil supplied at 250 V, 50 Hz supply. If the voltage across the resistance is 125 V and across the coil is 200 V. Calculate:
 - (i) Impedance, reactance and resistance of the coil
 - (ii) Power absorbed by the coil
 - (iii) Power factor of the coil
 Also draw phasor diagram.

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- (b) In the circuit given, R_L is variable resistance. If 110 V source is connected across AB with A terminal positive, find R_L for maximum power transfer. Also compute the value of maximum power. 10



- 3 (a) Draw phasor diagram of a transformer, loaded with lagging power factor load. 06
 (b) What is series resonance and what are the effects of series resonance? 06
 (c) A voltage of $(200 \angle 53.13) V$ is applied across two impedances in parallel. This values of the impedances are $(12 + j16) \Omega$ and $(10 - j20) \Omega$. Determine kVA, kVAR and kW in each branch and power factor of the whole circuit. 08
- 4 (a) Explain the input and output characteristics of a n-p-n transistor in the CE configuration. 10
 (b) What is transducer? Explain the construction and working of LVDT. 10
- 5 (a) Three identical coils, each having resistance of 15Ω and inductance of $0.03 H$, are connected in delta across a three phase, 50 Hz, 230 V supply. Calculate the phase current, line current, and total power absorbed. Draw phasor diagram. 10
 (b) Explain with neat diagram, construction and working of permanent magnet moving coil instruments. What are the advantages of these instruments? 10
- 6 (a) A parallel circuit consists of a $2.5 \mu F$ capacitor and a coil whose resistance and inductance are 15Ω and $260 mH$ respectively. Determine (i) the resonant frequency, (ii) Q-factor of the circuit at resonance, and (iii) dynamic impedance of the circuit. 06
 (b) A 4-pole, DC shunt motor has lap connected armature winding. The flux per pole is $30 mWb$. The number of armature conductor is 250. When connected to 230 V d.c. supply it draws an armature current of 40 A. Calculate the back emf and the speed with which motor is running. Assume armature resistance is 0.6Ω . 06
- (c) Draw a neat circuit diagram of a centre tap full wave rectifier with capacitor input filter and explain the working of capacitor input filter. 08
- 7 Write notes on any four of the following. 20
- (a) D.C. Shunt Motor
 (b) Two Wattmeter Method
 (c) FET as an amplifier
 (d) Pressure Transducers
 (e) Inverter
 (f) Capacitor Start single phase Induction Motor.