POKHARA UNIVERSITY

Level: Bachelor   Semester: Spring   Year   : 2017
Programme: BE   Full Marks: 100
Course: Basic Electrical Engineering   Pass Marks: 45
                                                   Time   : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Explain generation, transmission and distribution with the help of single line diagram.   7

   b) Using Node voltage method, find the current through each 10Ω resistors of the circuit as shown below.   8
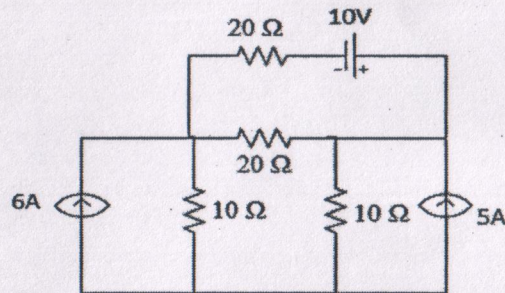

2. a) For the circuit shown below   8
      i.   Determine which components are absorbing power and which are delivering power
      ii. Is conservation of power satisfied? Explain your answer.
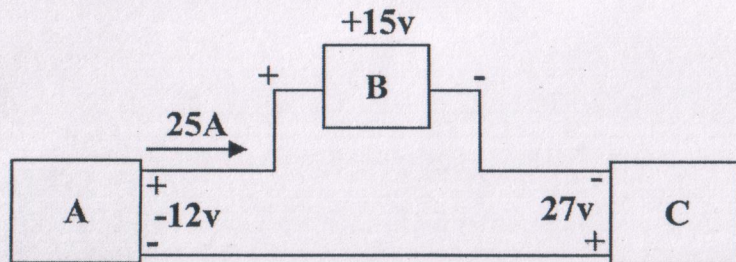
   b) Explain Thevenin's theorem. Also find the current across 10Ω resistance by using Norton's theorem.   7
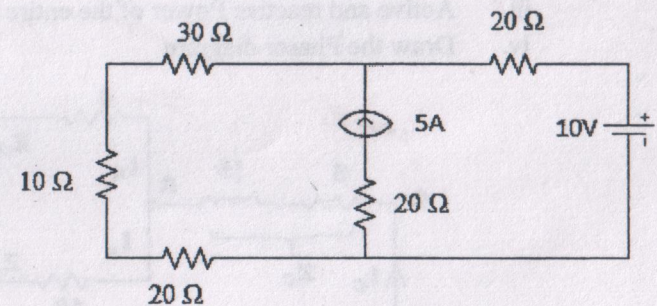

3. a) Solve for the current i_1 (through the 4Ω resistor) in the circuit shown below using superposition theorem. (All resistors are in Ohm).   8
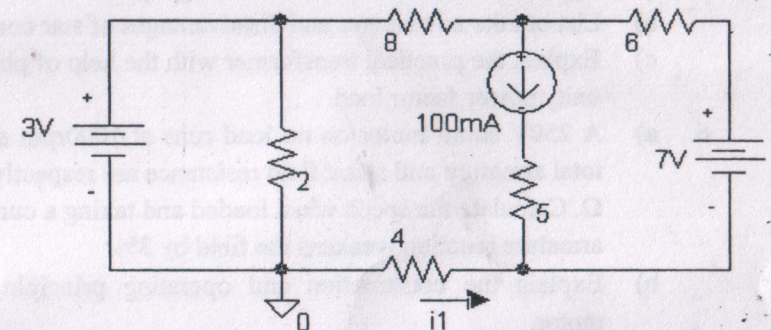
   b) Calculate the average value, RMS (effective) value and form factor of the output of half wave rectifier when the input to the rectifier is a purely sinusoidal alternating current.   7

4. a) A series RLC circuit consists of a 100Ω resistor, an inductor of 0.318H and a capacitor of unknown value. When this is energized by $v = 230\sqrt{2}\sin wt$ Volts supply, the current was found to be $i = 2.3\sqrt{2}\sin wt$ Amperes. Find i. value of capacitance, ii. Voltage across the inductor and iii. Total power consumed (Assume $w = 314.15$ rad/sec)   7

   b) In a series, parallel circuit two impedances are connected with series impedance as shown in figure below. If the voltage applied to the circuit is 200V, 50Hz. Calculate: 8

i. Current I_A, I_B and I_C

ii. Voltage across AB

iii. Active and reactive Power of the entire circuit

iv. Draw the Phasor diagram

200 V, 50 Hz
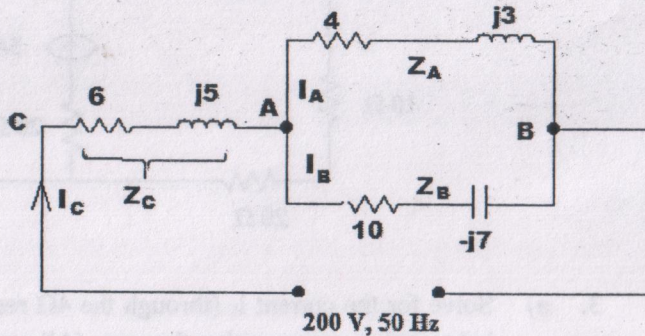
5. a) Explain the differences between single phase and three phase system.   4

   b) List out the advantages and disadvantages of star connected supply.   4

   c) Explain the practical transformer with the help of phasor diagram with unity power factor load.   7

6. a) A 250V shunt motor on no load runs at 1000rpm and takes 5A. The total armature and shunt field resistance are respectively 0.2Ω and 250 Ω. Calculate the speed when loaded and taking a current of 50A, if the armature reaction weakens the field by 3%.   7

   b) Explain the construction and operating principle of 3ϕ induction motor.   8

7. Write short notes on: (**Any two**)   2×5

   a) Star/Delta transformation

   b) Two wattmeter method of power measurement

   c) Speed control of dc motor

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