POKHARA UNIVERSITY

Level: Bachelor   Semester: Fall   Year   : 2014
Programme: BE   Full Marks: 100
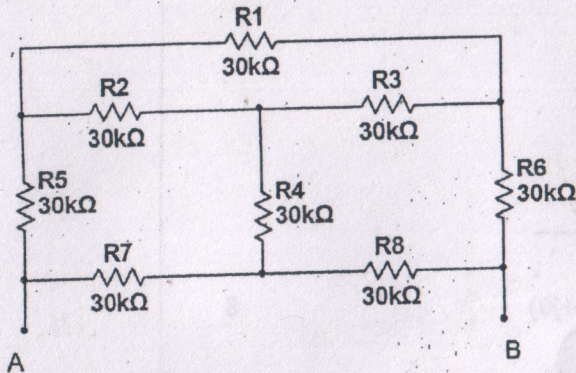Course: Basic Electrical Engineering   Pass Marks: 45
                                                              Time   : 3hrs.

*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) Find the equivalent resistance across the terminals A-B for the circuit shown in figure below.   8
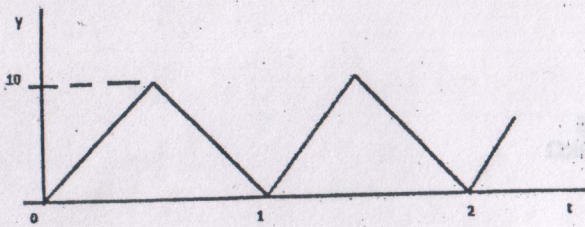

   b) State and explain maximum power transfer theorem with necessary derivation.   7

2. a) Determine the voltage across 3KOhm resistor using mesh analysis for the circuit shown below.   8
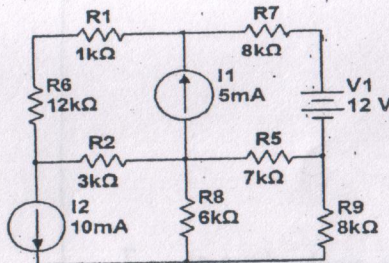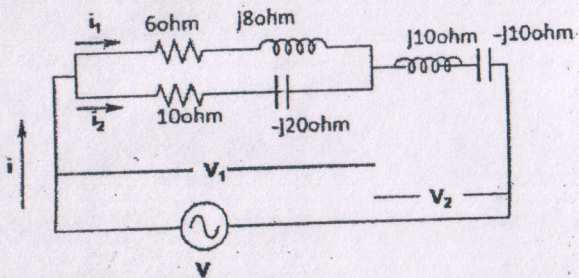
b) Find the voltage across 6KOhm resistor using Norton's theorem. 7
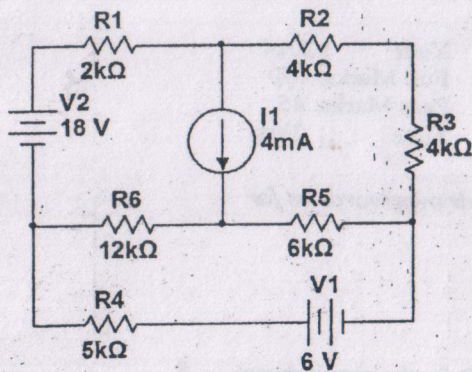
a) Find the average value, rms value and form factor of the given triangular waveform? 7

b) In the circuit given below, total current i=(20+j0) 8
   i. Calculate branch current i_1 and i_2
   ii. Voltage V_1 and V_2
   iii. Power factor of entire circuit
   iv. Active and Reactive power in the entire circuit.

a) In an R-L-C series circuit, current supplied by the single phase ac 7

source is 15<-38° Ampere. Determine the value of all three kind of power if R=100 ohm, X_L=35 Ohm and X_C=25 Ohm. If inductance is 8 Henry, find the resonant frequency.

b) A three-phase balanced star connected load with 6+j8 Ohm per phase is supplied by 440 V, 3-phase source. Find the line and phase currents, and the total power dissipated in the load.Derive the relationship between line and phase voltage in three phase balanced star connection. 8

5. a) Explain with a neat diagram the two wattmeter method for the measurement of three phase power and determine watt meter reading when it is connected to resistive load 7

b) A 10KVA 200/1000 V, 50 Hz, single-phase transformer gave the following test results: 8
   O.C. test(L.V. Side): 200 V, 2.4 A, 100W
   S.C. test(H.V. Side): 50 V, 10A, 150W
   i. Calculate the parameters of the equivalent circuit referred to L.V. Side.
   ii. Calculate efficiency for ½ rated 0.8 P.f. lagging, & load current for which it gives maximum efficiency

6. a) A 220V dc shunt motor runs at 500rpm when armature current is 50A. Calculate the speed if the torque is doubled Given that armature resistance is 0.2 ohm and flux remain constant.

b) Explain the working principal of induction motor with neat diagram.

7. Write short notes on: (Any two) 2×5
   a) Ideal voltage & current source
   b) Quality factor of RLC series CKT.
   c) Power factor and if significance