POKHARA UNIVERSITY

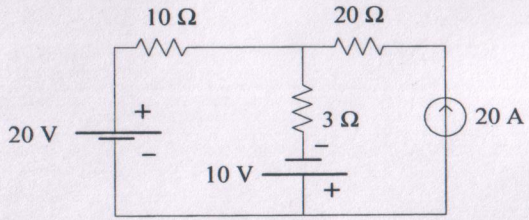
Level: Bachelor Semester: Fall Year : 2017
Programme: BE Full Marks: 100
Course: Basic Electrical Engineering Pass Marks: 45
Time : 3hrs.

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

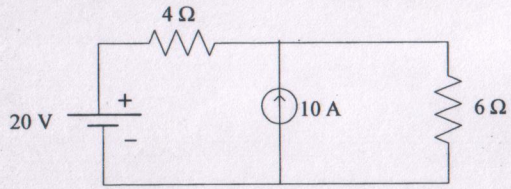
The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Throw light on role of electricity in modern society. 5
   b) What are the ideal and non-ideal (practical) sources? Explain each briefly. 5
   c) What is power factor and explain its significances. 5
2. a) Using superposition theorem, find the current through 10Ω resistor of the circuit as shown below. 8

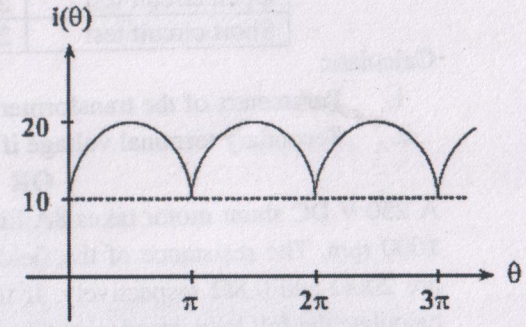


   b) Differentiate between Thevenin's theorem and Norton's theorem. Also find the voltage across 6Ω resistance by using Norton's theorem. 7



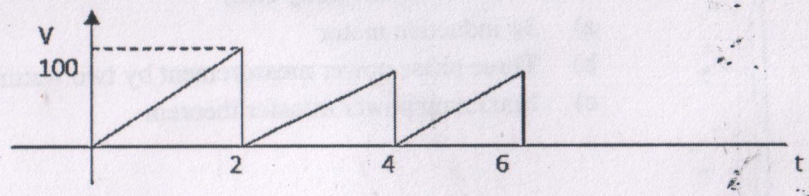
3. a) Compare mesh analysis and nodal analysis. Find node potentials for the given network. Also find the power dissipated in 3 ohm resistor. 8
   b) Write the difference between series resonance and parallel resonance? Show that the bandwidth for the series resonant circuit is the ratio of resonant frequency and quality factor. 7

4. a) What are advantages of AC over DC? Find the average and rms value of the given waveform. Also find the form factor. 2+6

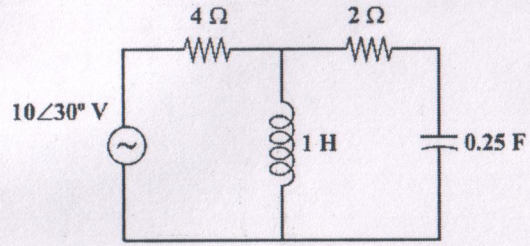


OR

Calculate the mean value and effective value of the wave shown. 8



   b) For the given circuit determine: 7
      i. circuit impedance
      ii. supply current and its phase angle
      iii. circuit power factor
      iv. active, reactive and apparent power.



5. a) Three similar coils having impedance of $15<20^0\Omega$ are connected in star to 400v, 3ϕ, 50HZ supply. Calculate: 7
      i. line and phase current
      ii. Power factor
      iii. Total 3ϕ powers

b) Define transformer and deduce the expression for EMF. 8

6. a) 25KVA, 1ϕ, 250/500v transformer gives the following results on tests: 7

Open circuit test	200V	1A	70W
Short circuit test	25V	5A	80W

Calculate:

i. Parameters of the transformer

ii. Secondary terminal voltage if it supplies 50A at 0.8 pf lag

OR

A 250 V DC shunt motor takes 8A line current on no load and runs at 1000 rpm. The resistance of the field winding and armature winding are 200Ω and 0.8Ω respectively. If the full load line current is 20A, calculate the full load speed, assuming constant air gap flux.

b) Explain the working principles of 3 – Ø synchronous motor. 8

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

a) 3ϕ induction motor

b) Three phase power measurement by two wattmeter method

c) Maximum power transfer theorem