

# Dr. Babasaheb Ambedkar Technological University, Lonere-402103

## Supplementary Examination December 2018

Course: First year (All branches)

Sem: I/II

Subject: Basic Electrical Engineering (EE104/EE204)

Max. Marks – 60

Date – 06/12/2018

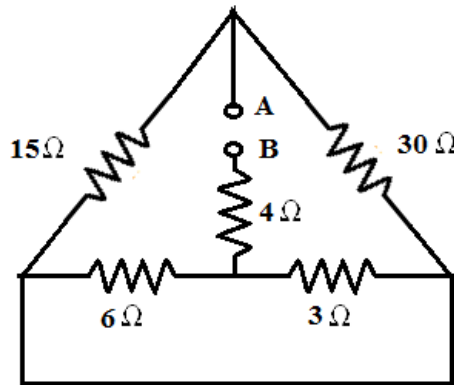
Duration: 03 Hrs.

### Instructions:

- All Question carry 12 marks.
- Attempt any five questions of the following.
- Illustrate your answer with neat diagram wherever necessary.
- If some part or parameter is noticed to be missing, you may appropriately assume it and mention it clearly.

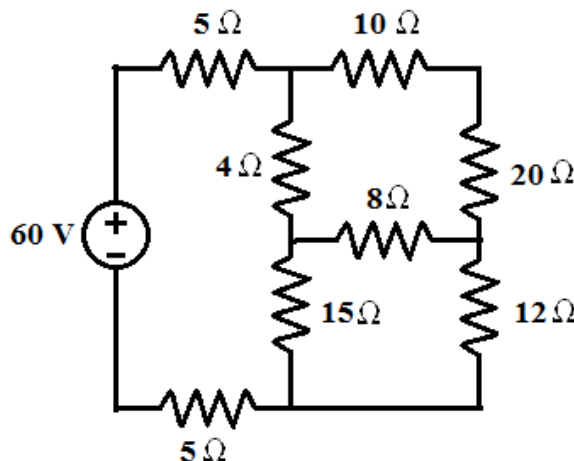
Q 1. a) A copper conductor has its specific resistance of  $1.6 \times 10^{-6} \Omega\text{-cm } ^\circ\text{C}$  and a (4)  
resistance temperature coefficient of  $1/254.5$  per  $^\circ\text{C}$  at  $20^\circ\text{C}$ . Find (i) the  
specific resistance and (ii) the resistance temperature coefficient at  $60^\circ\text{C}$ .

b) Find equivalent resistance between terminal A & B. (4)

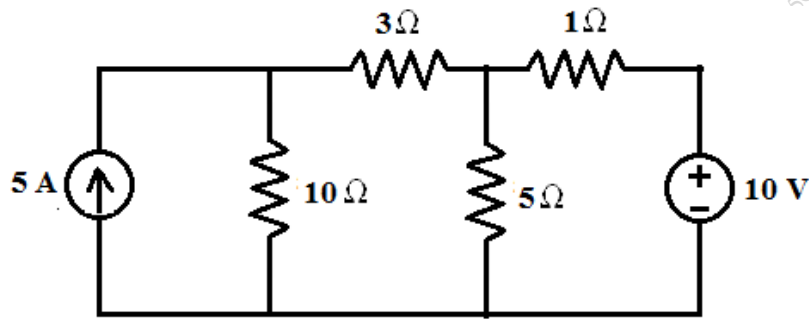


c) Give the definitions for following. (4)  
1) Force 2) Work 3) Power 4) Energy

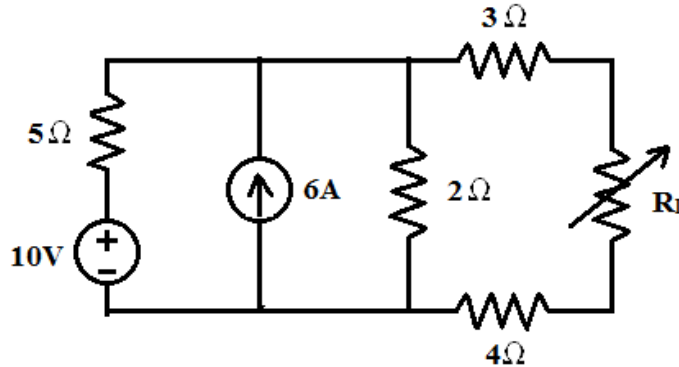
Q 2. a) Find current delivered by battery using star-delta transformation. (4)



b) For the network given below, find current through  $3\Omega$  resistor using nodal analysis. (4)



- c) Find the value of  $R_L$  for which maximum power is transferred through it. Also calculate the power transferred to  $R_L$  (4)



- Q 3. a) Find the following parameters of a voltage  $v = 200\sin 314t$ , (4)  
 1) Frequency    2) Form Factor    3) Crest Factor

- b) Find the resultant of following. (4)

i)  $e_1 = 25\sin \omega t$     ii)  $e_2 = 10 \sin (\omega t + \frac{\pi}{6})$     iii)  $e_3 = 30 \cos \omega t$   
 iv)  $e_4 = 20\sin (\omega t - \frac{\pi}{4})$

- c) Find the average power in pure capacitive circuit. (4)

- Q 4. a) An AC circuit consist of pure resistance and an inductive coil connected in series. The power dissipated in the resistance and the coil are 1000watts and 200 watts respectively. The voltage drop across the resistance and coil are 200V and 300V respectively. (6)

Calculate: i) Value of the resistance    ii) Current through circuit    iv) Resistance of coil    iv) Impedance of coil    v) Total impedance of circuit    vi) Supply Voltage.

- b) Explain with neat circuit resonance in RLC circuit. (6)

- Q 5. a) Explain in brief Self induced emf and Mutually induced emf. (6)

- b) Define the following terms, (3)

i) Magnetic field    ii) Magnetic lines of force    iii) Magnetic field strength.

- c) An iron ring of mean circumference 80cm is uniformly wound with 1000 turns of wire. Calculate the value of flux density that a current of 1A would produce in ring. Assume relative permeability of an iron to be equal to 1400. (3)

- Q 6. a) Derive the EMF equation of transformer. (6)

- b) Derive the equation for Energy stored in Capacitor. Also determine the equivalent capacitance of circuit containing a parallel branch of 5uF and 2uF in series with two capacitors of 3uF and 4uF. (6)