

Code No: 151AG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year I Semester Examinations, October/November - 2020

BASIC ELECTRICAL ENGINEERING

(Common to EEE, CSE, IT, ITE)

Time: 2 hours

Max. Marks: 75

Answer any five questions  
All questions carry equal marks

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1. Find the power supplied by different sources using KCL and KVL equations in the following given circuit shown in figure 1. [15]

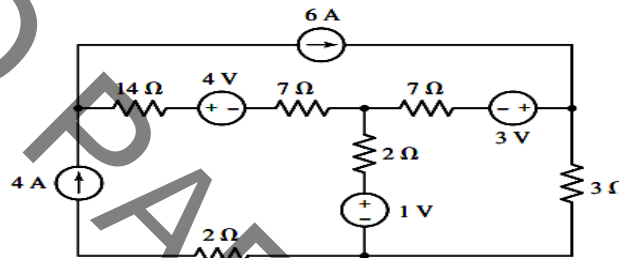


Figure: 1

2. Find the Thevenin's equivalent with respect to the terminals 'a-b' for the circuit in the following figure 2. [15]

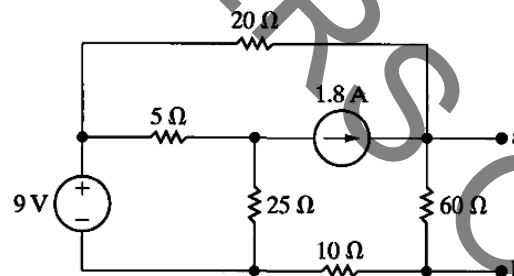


Figure: 2

- 3.a) What is the phasor diagram, draw the phasor diagrams of RL parallel circuit under steady state conditions?  
 b) Two loads in parallel are supplied by a single phase 230 V, 50-Hz supply:  
 Load A: 10 kVA at 0.8 power factor leading  
 Load B: 15 kW at 0.8 power factor lagging  
 Find the real power, reactive power and line current drawn from the supply by the combined load. [7+8]
- 4.a) A coil having an inductance of 2 H is connected in series with a resistance of 10  $\Omega$  and a capacitor of 50  $\mu\text{F}$ . The whole combination is connected to a 200 V variable frequency supply. Determine i) the resonant frequency, ii) the current in the circuit at resonance iii) corresponding voltage developed across the capacitor.  
 b) A balanced delta-connected load with a per-phase impedance of  $(12 + j9) \Omega$  is supplied by a 400 V, 50 Hz three-phase source, determine phase voltage, line voltage and currents in each phase. [7+8]

- 5.a) Discuss various losses occurred in a single phase transformer.
- b) The parameters of approximate equivalent circuit of a 4 kVA 200/400 V, 50 Hz single phase transformer are  
 $R_p = 0.15 \Omega$ ,  $X_p = 0.37 \Omega$ ,  $R_0 = 600 \Omega$  and  $X_0 = 300 \Omega$   
When rated voltage of 200 V is applied to the primary, a current of 10 A at lagging power factor of 0.8 flows in the secondary winding. Calculate i) the current in the primary,  $I_p$   
ii) terminal voltage at the secondary side. [8+7]
- 6.a) Describe the operation of auto transformer? How does the current flow in different parts of its winding?
- b) What are the distinguished features of Y-Y and  $\Delta$ -Y three phase transformers? [8+7]
- 7.a) Explain various speed control methods of separately excited dc motor.
- b) Describe briefly the construction and working of any single phase induction motor. [8+7]
- 8.a) Describe the PVC cables of different types and their sizes which are used for low voltage ratings?
- b) What are the important features of ELCB, where it is used for protection? [8+7]

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