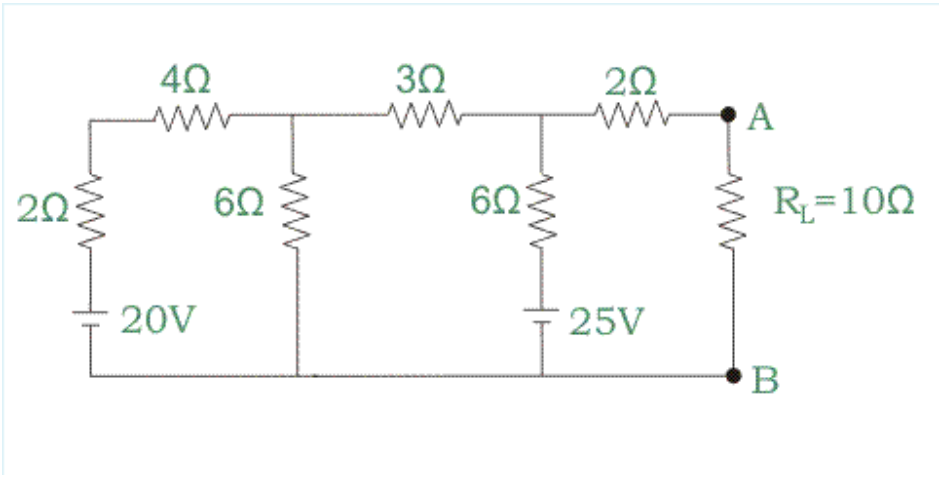
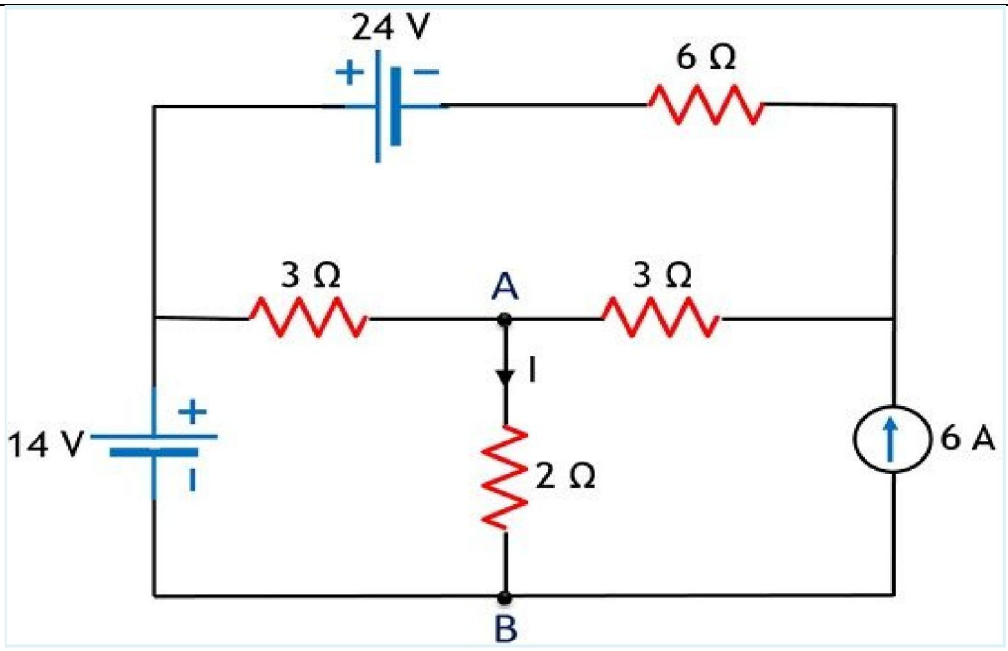
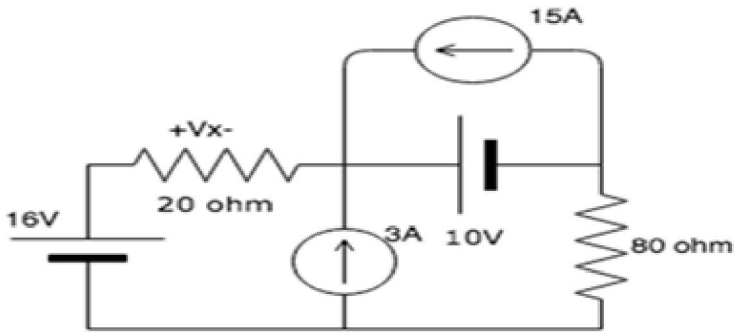
UIT-RGPV, BHOPAL
Open Book Offline Exam

Examination: Jan- Feb 2021(Session Nov-Dec 2020) **Time: 03 hrs**

Subject Code: BT 104/BE104 **Subject Name: FUNDAMENTAL OF ELECTRICAL ENGINEERING** **Max Marks : 105**

Instructions: Attempt all questions. Parts a ,b, c of each question are compulsory for which the allotted marks are 3,4,4 respectively, and d & e part will have an internal choice for which the allotted marks is 10 . All subparts of a question should be answered at one place.

Q. No.	Question	CO
1(a)	State Thevenin's Theorem with appropriate example?	CO.1
(b)	Find thevenin's resistance across load resistance? 	CO.1
(c)	Distinguish between a) active and passive element b) ideal and practical voltage source	CO.1
(d)	Solve the given network using Superposition theorem & find out current in 2 ohm resistor.	CO1

		
	OR	
(e)	Find voltage drop across resistance shown in figure……. 	CO.1
2(a)	Find the RMS value of a full wave sinusoidal waveform?	CO.2
(b)	Two resistors are connected in series having values 15 Ω and 5 Ω respectively. A sinusoidal voltage of 230V, 60 Hz is applied across the combination. Calculate current in circuit?	CO.2
(c)	In circuit i=10cos(314t – 30)& v= 100cos(314t + 20). Find values of R	
(d)	An alternating voltage V=160 +j170 volt is connected across a RL series circuit. A current of I= 12-j5 A flows through the circuit. Calculate impedance, power factor and power consumed. Draw the phasor diagram. The supply frequency is 50 Hz.	CO.2
	OR	
(e)	When a resistor & a choke coil in series are connected to 240V ac supply, a current of 3A flows lagging 60° behind the supply voltage, while the voltage across	CO.2

	choke coil is 216V. Find resistance of resistor & the resistance & reactance of the inductor. Also find voltage across resistor & power absorbed by circuit?	
3(a)	The power taken by a 3-phase induction motor was measured by 2-wattmeter method & the readings were found to be 2500W & 500W. Find the power taken by the motor & its power factor?	CO.3
(b)	Distinguish between the following: a) balanced supply and unbalanced supply b) balanced load and unbalanced load	CO.3
(c)	A balanced connected load is supplied from a symmetrical 3-phase ,410V,star connected system. The current in each phase is 30A & lags 30° behind the phase voltage. Find a) phase voltage b) active power c) reactive power drawn by load.	CO.3
(d)	Draw the circuit and phasor digram for 2 wattmeter method of measurement of power in a balanced 3 phase circuit? Also derive the power relationship for 2 wattmeter method?	CO.3
	OR	
(e)	Derive the relationship between line current, line voltage,phase current and phase voltage in case of delta connection? Also draw the phasor diagram?	CO.3
4(a)	Define MMF of coil	CO.4
(b)	Give analogy between electric & magnetic circuit?	CO.4
(c)	Define B-H curve for magnetic material?	CO.4
(d)	Determine the parameters in the transformer by OC test and SC test. Also draw the equivalent circuit under the OC and SC test?	CO.4
	OR	
(e)	A 5 KVA , 500/250 V, 50 Hz 1-PH transformer gave following details: OC – 500V , 1A , 50W (HV SIDE OPEN) SC - 25V , 10 A , 60 W(LV SIDE SHORTED) Calculate the efficiency on full load at 0.8 pf lag	CO.4
5(a)	Enlist the application of a synchronous machine?	CO.5
(b)	Draw a neat sketch of a DC machine and name the component parts?	CO.5
(c)	Write a short note on losses in electrical machine?	CO.5
(d)	Derive the emf equation of a synchronous machine?	CO.5
	OR	
(e)	Describe the construction and working of a three phase induction motor with the help of appropriate diagram.?	CO.5