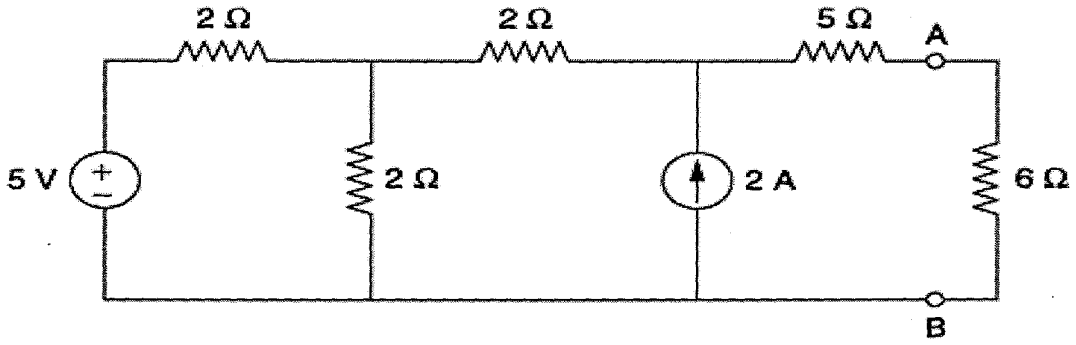
U.I.E.T., K.U.K. B. TECH. 2ND SEM CREDIT BASED THEORY EXAM: MAY-2019								
Course Title : **BASIC ELECTRICAL ENGINEERING**	**Roll No.**	**251**						
Course No.: **ES-101** **TIME:3 HR MM:75**								
Paper Code:**52002 /MAY2019**								

Note: Attempt parts A, B & C separately. Do not inter-mix them.

Q1	PART-A(in case of numerical, also write brief calculation process followed by your answer)	M
i	If current $I_1 = 20\ \text{Cos}\ (\omega t+120^0)$ A and $I_2 = -10\ \text{Sin}\ (\omega t)$ A, then find their sum in sinusoidal periodic sine form.	3
ii	In case of balanced delta connected resistive ckt., when one resistor is opened, how much percent, will the power be remained w.r.t. the earlier value ?	3
iii	Draw neatly equivalent circuit of a 1- phase transformer and write label (name/meaning) of each parameter.	3
iv	Define (a) Fleming's RH Rule (b) Fleming's LH Rule	3
v	The voltage phasor for circuit is $20\angle 75^0$ V and the current phasor is $4\angle 30^0$ A. The magnitude of voltage and currents are shown in rms. Find the active, reactive and apparent powers of the circuit with units.	3

Q	PART-B (all Questions are compulsory)	M
2	Explain superposition theorem and method to suppress a voltage and current source.	5
3	Given an ac periodic voltage wave ($v = V_m \text{Cos}\ \Theta$, where $\Theta = \omega t$.), Evaluate its average and r.m.s. values.	5
4	Establish relation between line voltage and phase voltage in a star connected balanced 3-phase supply system.	5
5	Prove that the mechanical power developed in a moving shaft is $2\pi NT/60$ watt, where N is r.p.m. & T is torque.	5

	PART-C (Attempt exactly one question from each of units given below)	
Q	UNIT -I	M
6	Find Thevenin's equivalent of the ckt. w.r.t. **5 Ω.** Then directly convert the resultant ckt. into Norton's ckt. 	10
7	(a)Explain maximum power transfer theorem in detail and its significance. (b) Define suerposition theorem.Explain how to suppress a voltage source and a current source while applying a superposition theorem to linear circuits.	5 5
	UNIT -II	
8	Explain in detail the sinusoidal frequency response of parallel RLC ckt. with condition of resonance.	10
9	(a)An ac circuit consists of a pure resistance and a coil in series. The power dissipated in the resistance is 500W and the drop across it is 100 V. The power dissipated in the coil is 100W and the drop across it is 50V. Find the inductive reactance and internal resistance of the coil and the supply voltage. (b)Explain impedance and power triangles in case of RL series circuit.	6 4
	UNIT -III	
10	Draw neatly the following line voltage waveforms on simultaneous time axis : $V_1 = V_m \text{Sin}\omega t$, $V_2 = V_m(\text{Sin}\omega t - 120^0)$ & $V_3 = V_m(\text{Sin}\omega t - 240^0)$.,Prove that $V_1 + V_2 + V_3$ will yield a neutral node. If this supply is fed to a delta connected set of identical resistors, prove that instantaneous power dissipation is constant and hence, find its value.	10
11	With the help of suitable circuit and phasor diagram and circuit equations, explain in detail the working of a transformer: (a) at no load, (b) at purely resistive load (actual case).	10
	UNIT -IV	
12	Explain the construction of a DC generator and the working of commutator with neat sketches.	10
13	Explain the working of Synchronous generator and Synchronous motor with suitable sketch.	10