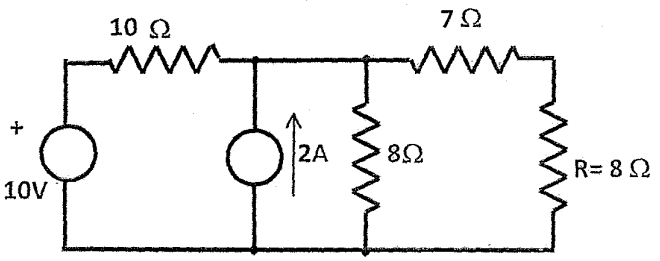
U.I.E.T., K.U.K. B. TECH. 2ND SEM (RE-APPEAR) CREDIT BASED THEORY EXAM: MAY-2019											
ELECTRICAL TECHNOLOGY FUNDAMENTALS				Roll No.	251						
Paper Id.: 52012	Sub.Code:EE-101	Time:3 HR	MM:75								

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

Q1	PART-A(in case of numerical, also write brief solution steps followed by your answer)	M
i	Two bulbs marked as [20 W, 25V] & [10 W, 25V] glow in series across 25 V supply. Find the total Power consumed.	3
ii	Find the active ,reactive and apparent powers by a load impedance (4 - j3) Ω passed by a current 5cos (100π t+π) A.	3
iii	An inductor of 1 mH and a capacitor of 10 μF when connected in series to an a.c. have equal reactances. Find the angular frequency (in radian per second) of the a.c. source.	3
iv	Define Fleming's Left hand rule and give its use.	3
v	Define eddy current loss. Give remedy to reduce the same.	3

Q	PART-B (all Questions are compulsory)	M
2	Define superposition theorem and method to suppress a voltage and current source.	5
3	An ac wave ($v = V_m \sin \Theta$, where $\Theta = wt$). Find out its average and R.M.S. values for both complete and half cycles.	5
4	Establish relation between line current and phase current in case of delta connected 3 -phase power system.	5
5	Explain in brief the basic principle and formula involved in motoring and generation actions in electrical machines.	5

	PART-C (Attempt exactly one question from each of units given below)		
Q	UNIT -I		M
6	Find the Thevenin's equivalent ckt. of the network w.r.t. the load resistance R .		10
7	(a)Three resistors 12 ohm, 18 ohm and 36 ohm are connected in parallel. This parallel circuit is connected in series with a resistor 'R'. The whole circuit is connected to supply of 60 Volt and it is found that power developed in 12 ohm resistor is 48 W. Find the value of R and total power. (b)Define the following ckt. elements with examples: Linear, Non linear, Unilateral, Bilateral & Passive.		5 5
	UNIT -II		
8	A series RLC circuit with R = 10 Ω , L = 400 mH and C = 2 μF is connected to an AC voltage source which has a maximum amplitude V_m =100 V,(i) What is the resonant frequency ω_0 ?(ii) Find the rms current at resonance(iii) Let the driving frequency now be ω = 4000 rad/s, then find X_C , X_L , Z and P.F. ,current in sinusoidal form & active power.		10
9	Explain in detail the sinusoidal frequency response of series RLC ckt. with condition of resonance.		10
	UNIT -III		
10	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
11	(a)Given: $V_1 = V_m \sin\omega t$, $V_2 = V_m(\sin\omega t - 120^0)$ & $V_3 = V_m(\sin\omega t - 240^0)$,Prove that $V_1 + V_2 + V_3 = 0$ (b)If this 3-phase supply is fed to a delta connected set of identical resistors, prove that instantaneous power dissipation is constant and hence, find its value.		5 5
	UNIT -IV		
12	Explain the constructional features of a DC generator and derive the equation of generated EMF in it.		10
13	Draw neatly the waveforms on simultaneous time axis: $V_1 = V_m \sin\omega t$, $V_2 = V_m \sin(\omega t - 120^0)$, $V_3 = V_m \sin(\omega t - 240^0)$. Hence, explain that a **3-phase pulsating flux is equivalent to a single bipolar rotating flux,** with suitable steps containing neat sketches.		10