

Internal Assessment Test II										
Sub:	BASIC ELECTRICAL ENGINEERING						Code:	18ELE13		
Date:	02/03/2021	Duration:	90 mins	Max Marks:	50	Sem:	1	Section:	A,B,C,D,E,F,G	
Note: Answer any <b>FIVE FULL</b> Questions Sketch neat figures wherever necessary. Answer to the point. <b>Good luck!</b>										
								Marks	OBE	
									CO	RBT
1a	Show that in a pure inductor the current lags behind the voltage by $90^\circ$ . Also draw the voltage and current waveforms.						[5]	CO2	L2	
1b	A coil of power factor 0.6 is in series with $100\mu\text{F}$ capacitor. When connected to a 50Hz supply, the potential difference across the coil is equal to potential difference across the capacitor. Find the resistance and inductance of the coil.						[5]	CO2	L3	
2	With a neat diagram, explain how the 3-phase active power can be measured by two wattmeter method. Hence, obtain the expression for power factor. Draw the phasor diagram.						[10]	CO3	L3	
3a	Three similar coils each having resistance of $10\ \Omega$ and reactance of $8\ \Omega$ are connected in star across a 400 V, 3-phase supply. Determine (i) Line current; (ii) Total power; and (iii) reading of each of the two wattmeters connected to measure the active power.						[6]	CO3	L4	
3b	What is meant by power factor in an ac circuit? What is its significance?						[4]	CO2	L1	
4a	Three coils each of impedances $20\angle 60^\circ\ \Omega$ are connected in star to a 3-phase 400 V, 50 Hz supply. Find the reading on each of the two wattmeters connected to measure the power input.						[4]	CO3	L4	
4b	Deduce the relationship between the phase and line currents of a 3-phase delta connected system.						[6]	CO3	L3	
5a	A resistance of $7\ \Omega$ is connected in series with a pure inductance of 31.8 mH and the circuit is connected to a single phase 100 V, 50 Hz, sinusoidal supply. Calculate (i) Circuit current; (ii) Phase angle; (iii) Power factor; and (iv) Power.						[5]	CO2	L3	
5b	Show that voltage and current in a pure resistive circuit are in phase and power consumed in the circuit is equal to product of rms value of voltage and current.						[5]	CO2	L2	
6a	Derive the expression for power in AC circuit in terms of voltage, current and power factor of the circuit.						[5]	CO2	L2	
6b	Two impedances $Z_1 = (0.167 - j0.167)\ \Omega$ and $Z_2 = (0.1 + j0.05)\ \Omega$ are connected in parallel across a 100 V, 50 Hz ac supply. Calculate the current in each branch and total current. Also, find the power factor of the circuit.						[5]	CO2	L3	
7a	With a neat connection diagram explain three-way control of lamp. Also develop the truth table indicating the state of lamp for different positions of switches.						[6]	CO5	L2	
7b	Write short note on (i) MCB; and (ii) Precautions against electric shock.						[4]	CO5	L2	
8a	What is earthing? Why is earthing required? With a neat sketch explain plate earthing.						[6]	CO5	L2	
8b	Given $v(t) = 200 \sin(377t)$ V and $i(t) = 8 \sin(377t - 30^\circ)$ A for an AC circuit. Determine: (i) Reactive Power; (ii) True power; and (iii) Apparent power.						[4]	CO5	L2	