Dept: EC	Sem/Div: I/ABC	Course: Basic Electrical Engineering	Course Code: 18ELE13
Date:02/02/2021	Time: 9:30-11:00	Max Marks: 50	Elective:N

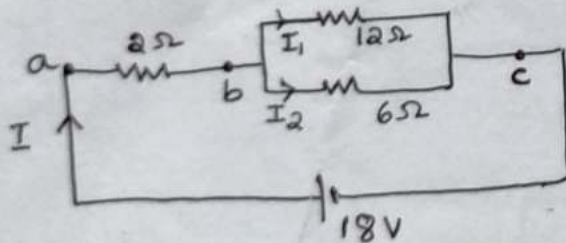Note: Answer any 2 full questions, choosing one full question from each part.

| Q N	Questions	Marks	RBT	COs
	PART A			
1 a	State and explain Kirchhoff's laws as applied to an electric circuit.	6	L1	CO1
b	Explain the generation of single phase AC induced emf with suitable diagram.	7	L2	CO1
c	Two conductors connected in parallel across 100V dc supply, take 10A current from the supply. Power dissipated in one conductor is 600W. What is the resistance of each conductor?	6	L3	CO1
d	The equation of an alternating current is given as i=62.35 sin(323t) Amps. Determine its maximum value, frequency, rms value, average value and form factor.	6	L3	CO1
	OR			
2 a	Derive the equation for root-mean-square value of an alternating current in terms of maximum value.	6	L2	CO1
b	Show that in a pure inductor the current lags behind the voltage by 90°. Also draw the voltage and current waveforms.	6	L2	CO1
c	The maximum value of a sinusoidal alternating current of frequency 50Hz is 25A. Write the equation for instantaneous value of the alternating current. Determine its value at 3ms.	6	L3	CO1
d	Determine $I, I_1, I_2, V_{ab},$ and V_{bc} in the network. 	7	L3	CO1
	PART B			
3 a	Find the equivalent resistance, when three resistances are connected in (a) series and (b) parallel.	8	L2	CO1
b	Show that the voltage and current in pure resistive circuit are in phase and power consumed in the circuit equal to product of rms voltage and current. The circuit is excited by the a.c. source.	7	L2	CO1
c	For the bridge circuit shown in figure. calculate current in all branches and power supplied by the source. 	7	L3	CO1
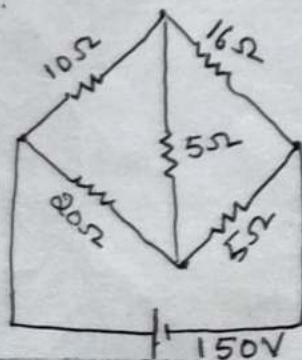
| | | 3 | L3 | CO1 |

d Find the resistance across SM of the network shown in figure.
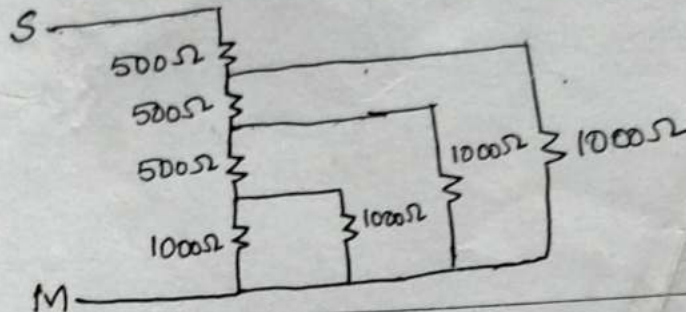
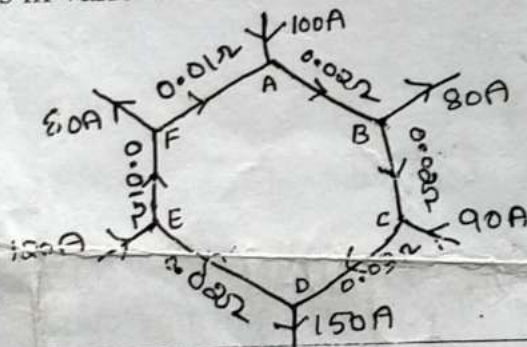| | OR | | 6 | L1 | CO1 |

4 a State Ohm's Law. Mention its limitations. — 8 — L2 CO1

b Show that a pure capacitance does not consume any power. Draw the waveforms of voltage, current and power, when alternating voltage is applied to pure capacitance.

c Find the currents in various branches of the given network shown in figure. — 7 — L3 CO1

d Reduce the network, given in figure to a single resistance between terminals A and B. — 3 — L3 CO