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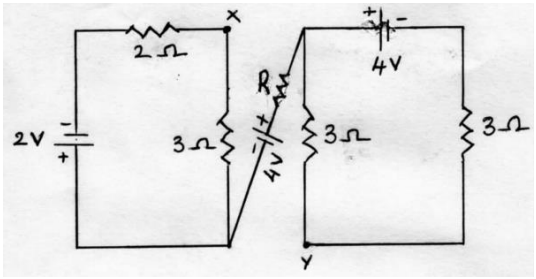
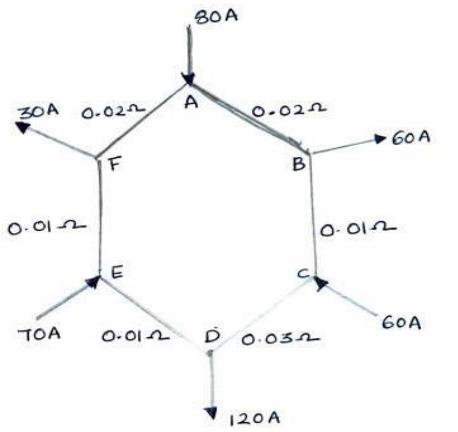
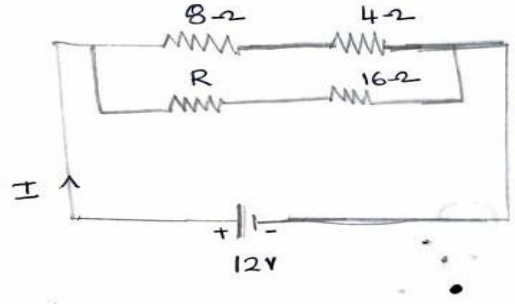
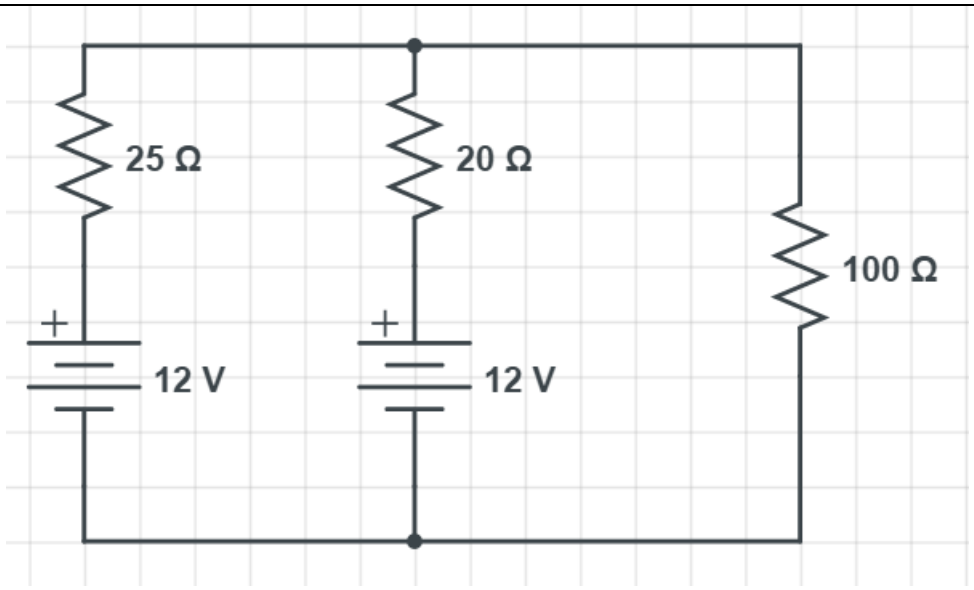
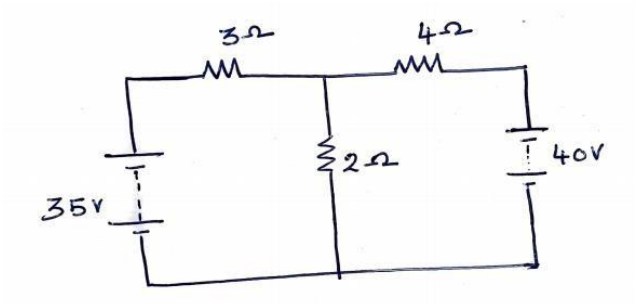
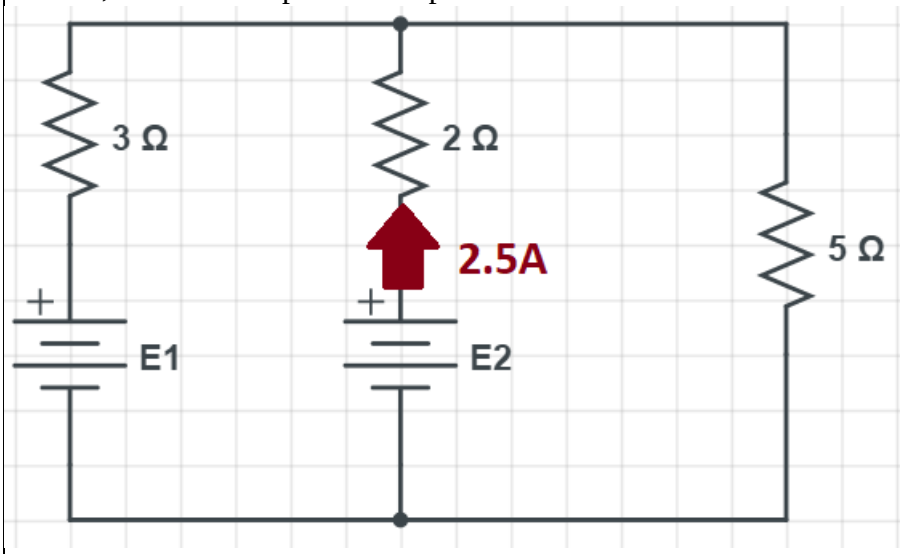
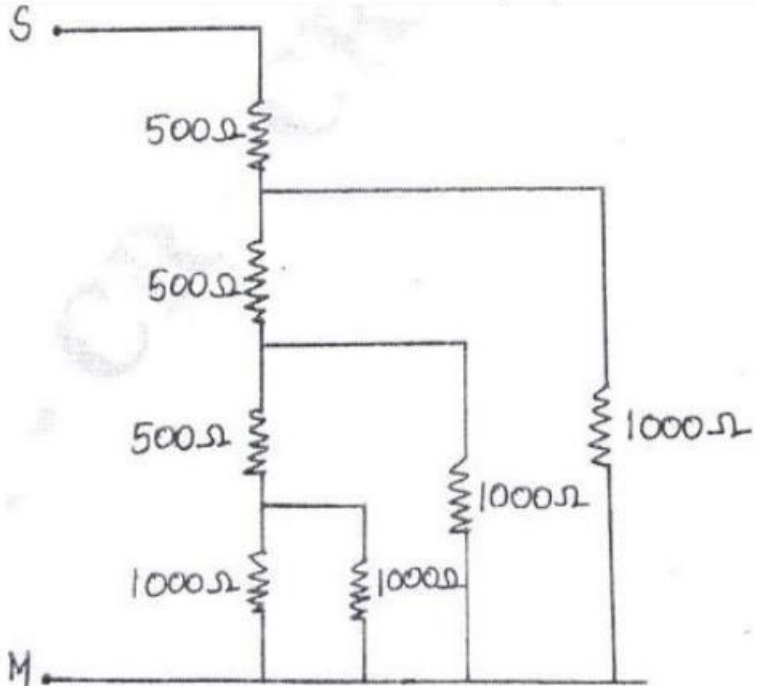
Internal Assesment Test I

Sub:	BASIC ELECTRICAL ENGINEERING							Code:	18ELE13
Date:	27/01/2021	Duration:	90 mins	Max Marks:	50	Sem:	1	Section:	A,B,C,D,E,F,G

Note: Answer any **FIVE FULL** Questions
Sketch neat figures wherever necessary. Answer to the point. **Good luck!**

		Marks	OBE CO	OBE RBT
1 (a)	State and explain Ohm's law with an illustration. Also list its limitations	[5]	CO1	L2
(b)	For the circuit shown in figure ,Obtain the voltage between points X and Y 	[5]	CO1	L4
2 (a)	Find the current in various branches of the given network 	[4]	CO1	L3
(b)	A circuit consist of two parallel resistors having resistances of 20 Ω and 30 Ω respectively connected in series with a 15 Ω resistor. If current through 15 Ω resistor is 3 A, find (i) current through the branches; (ii) voltage across whole circuit; and (iii) power consumed by 20 Ω and 15 Ω resistors	[6]	CO1	L3
3 (a)	If the total power dissipated in the circuit is 18 W, find the value of R and its current 	[5]	CO1	L3
(b)	Find the current supplied by each battery & power dissipated across 100Ω resistor	[5]	CO1	L3

				
4 (a)	Calculate the current through the 2 Ω resistor in the given circuit 	[5]	CO1	L3
(b)	Find E_1, E_2 & I when power dissipated in 5 Ω resistance is 125W. 	[5]	CO1	L2
5 (a)	State and explain KVL and KCL with examples.	[6]	CO1	L2
(b)	A current of 30A flows through two ammeters A and B in series. The potential difference across A is 0.3V and across B is 0.6V. Find how the same current will divide between A and B when they are in parallel.	[4]	CO1	L3
6	Define average value and rms value of a sinusoid. Derive the expressions and obtain the form factor and the peak factor of the sinusoid.	[10]	CO2	L3
7	The equation of an AC voltage & current are given as v(t) =100 sin(314t + 60°) V , i(t) = 10 sin(314t) A, determine (i) peak current; (ii) average voltage; (iii) frequency; (iv) time period; (v) RMS value of current; (vi) instantaneous value of voltage at t = 3 ms; (vii) form factor; and (viii) phase difference between voltage and current & state which one is leading	[10]	CO2	L3
8(a)	Explain the terms (i) Time period (ii) Frequency (iii) Instantaneous value (iv) Amplitude (v) Angular Frequency of a sinusoidal alternating voltage.	[5]	CO2	L2

(b)	Find the equivalent resistance across S and M in the given figure 	[5]	CO1	L3

BEE – Scheme of Evaluation for IAT-1.

1) a) ohms law – Statement and formula – 2.5m.

limitations of ohms law – 2.5m } 5m.

1) b)

$I_1 = 2/5$ A , $I_2 = 2/3$ A. ⟶ 3m.

$V_{xy} = -3.2$A ⟶ 2m.

2) a)

$I = 39$A ⟶ 4m.

2) b)

(i) $I_{20\Omega} = 1.8$A

$I_{30\Omega} = 1.2$A } 2m.

(ii) $R_{eq} = 27\Omega$

$V_{ab} = 81$V } 2m.

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(iii) $P_{20\Omega} = 64.8\,W$

$P_{15\Omega} = 135\,W$ } 2 m.

3) a)

$R = 8\,\Omega$.

$I_R = 0.5\,A$ } 5 m.

3) b)

$I_1 = 0.048\,A$, $I_2 = 0.108\,A$ ⟶ 3 m.

$P_{dc(100\Omega)} = 1.1664\,W$ ⟶ 2 m.

4) a)

$I_1 = 11.154\,A$, $I_2 = 10.385\,A$. ⟶ 3 m.

$I_{2\Omega} = 21.538\,A$ ⟶ 2 m.

4) b)

Procedure — 2 m

$E_1 = 32.5\,V$ ⟶ 1 m

$E_2 = 30\,V$ ⟶ 1 m

$I = 2.5\,A$ ⟶ 1 m

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5) a) KCL + Example → 3m.
KVL + Example → 3m. } 6m.

5) b) ~~I_{200}~~ = $I_A = 20A$
$I_B = 10A$ } 4m.

6) Average value derivation → 3m
Rms " " → 3m
form factor " → 2m.
Peak factor " → 2m } 10m.

7) i) $I_{Peak} = 10A$ → 1m
ii) $V_{avg} = 63.694V$ → 1m
iii) $f = 50Hz$ → 1m

(iv) $T = 0.02\,s$ → 1m

(v) $I_{rms} = 7.071\,A$ → 1m

(vi) $v(t) = 91.354\,V$ → 3m.

(vii) Form factor = 1.11 → 1m

(viii) $\phi = 60^\circ$, Voltage is leading → 1m.

8) a)

(i) Time period → 1m
(ii) Frequency → 1m.
(iii) Instantaneous value → 1m
(iv) Amplitude → 1m
(v) Angular frequency → 1m

} 5m.

8) b)

$R_{eq} = 1000\,\Omega$ → 3m.
procedure → 2m

} 5m.