CSE250

CIRCUITS AND ELECTRONICS

EXPERIMENT NO.	: 0.3						
EXPERIMENT NAME	. VERIFICATION OF KCL AND KVL						

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SECTION: 07

1) Objective	3) Cinevit / Block Diagrain
- verify Kirchhoff's volto	age law (KVL) with the help
of series circuit	KCL
- verify Kirchhoff's curr	ent law (KCL) with the help
of a simple parallel circ	cuit
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
> Apparatus	
VAI 53	V. 5 V = VE.01
KCL	N V L
- one DC Ammeter (0-1A)	one DC Ammeter (0-1A)
- one multimeter	- one multimeter
- three resistors	- three resistors
- one DC power supply	- one DC power supply
Proteus	
KCL	KVL
- one voltage source	- one voltage source
- three resistors	- three resistors
- three ammeters	- three voltmeters
- connecting wires	- connecting wires
ground	ground
K3	

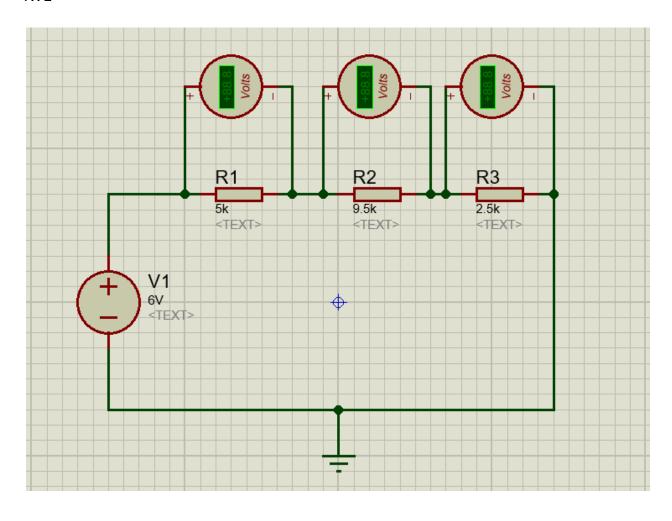
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3>	Circuit / Block Diagram	Objective	
olad	chhoff's voltage law (KVI) with the	aid walley Tie	
	KCL tigogio	* · · · · · · · · · · · · · · · · · · ·	
also	schoff's cuppent law (KCL) with the	Venifu Kir	
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		Apparatus	< B
	+		
9 30 30 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	$10.5 \text{V} = \text{V2} \leq \text{R1} \leq \text{R2}$	₹ R3	
CAT-	3.0 KA (A 8.5 KA	2.5 K.2	
-		vitium ano -	
		iaan aand+ -	
		- one DC sou	
4			
		Perteus	
	KVI	\$ 37.2	
* * * * * * * * * * * * * * * * * * * *	KVL	K C L	
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	houng -	bauono -	
	2.5 k.Ω.		
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	R3		9
			2
8		\$ 9. a.	
0.5		0	

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4>	Results / Analys	sis AVX +	o naitéai	2 insV: 1 s	Toble			
ξV	KVL (Theoreti	cal Observa	istancenoit	Nation Res	Obser			
	Re = R1 + R2				D R3 = 2 5k0			
88.0	= (5 + 9.5	+ 2.5) k 1	9.5	lation				
	= 17 KA							
88.0	V1 = R1 X V				V = 6 V			
		= R	6 /s	Re				
	= 5 x 6		. <u></u> x	- 2.5 ×	5 × 6			
	= 1.765 V				Vol			
				· ·				
	KCL (Theoretic	al Observat	ion)	, /				
	I, = V	I ₂ = V	I3 =	V				
	Ri	R ₂		R ₃				
	= 10.5	= 10.5	=	0.5				
	3	8.5		2.5				
	= 3.50 m A	= 1.235	mA = 1	1.200mA				
	= 3.500 + 1.235 + 4.200							
	= 8.935							
	2							

			, ° ,						
				minimum (gill) a martinosis adminis capit in their succession in it deamen					
	Table 1: Verification of KVL						Opisaussion (6)		
,	Observation	8	R ₂	R3	dVa	Viri	9 V2 9	V ₃	V1 + V2 + V3
· +100	series cio	(kv)	(KV)	(KV)	(V)	(V)	(V)	(V)	2004(V)
40	plan ant	1-14	(KOL)	N O	1 30	10963	a\24	ehho	in bao
94	Simulation	5 5 CH	9.5	2.5	. 60	1.76	3.35	0.88	10m 5.99
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	roomes IV								
	Table 2:								
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	the hypoth								
*	Simulation		8 8		£ .	8		E .	
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	in hie discri				5000	The state of the s			
14	Theoretical	3 E	8.5	2.5	8.94	3.50	1.24	4.20	8.94
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	Questions								
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Α.	A voitmeter	is con	nnecte	d in	parc	ulel -	to +h	e co	mponent whereas
									component.
				\$ v 2					

b) Discussion

In this experiment, we had verified Kirchhoff's voltage law (KVL) with the help of a series circuit and Kirchhoff's current law (KCL) with the help of a simple parallel circuit. Initially, we had to set up the provided circuits on Proteus using various components. After we are done constructing the circuit on Proteus, we run the simulation and obtain the different values to be tabulated in the tables. Then, we calculate the values of the tabulated variables theoretical using KCL and KVL component equations. Consequently, after we have obtained both the values of the simulation and theoretical observations and recorded the values in the respective tables of both the experiments, we can finally compare the results and prove the hypothesis. We can notice that both the tables have the same values in its by theoretical and simulation observations. There is a slight, negligible discrepancy in Table 1 where Va VI+V2+ V3 as Va is 6V whereas VI+V2+V3 = 5.99 V. This discrepancy occurs due to the rounding off of decimal numbers and hence, it is negligible. In conclusion, as the rest of the results match perfectly, we have successfully proved KCL and KVL ... to 29100



KCL

