

Midterm paper



Spring 2021

Circuit system-I

Submitted by: **Ashfaq Ahmad**

Registration No: **19PWCSE1795**

Class Section: **B**

Total Pages: 9

“On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work.”

Student Signature: _____

Submitted to:

Dr. Salman Ahmed sab

May 24, 2021

Department of Computer Systems Engineering
University of Engineering and Technology, Peshawar

Name: HSHFACP AHMAD
Reg No: 19PWCSE1795

Page No: ①

Day: MTWTFSS

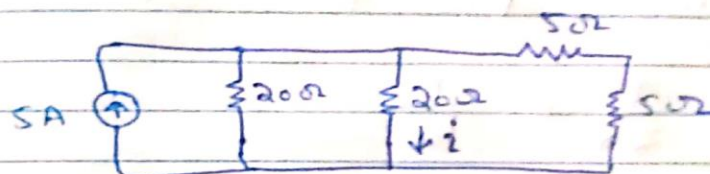
Date: ___/___/___

Answer No: 1

Circuit Question

Given:

$$\text{Current} = I = 2.5 \text{ A}$$



Required

$$\text{Verify } i = 2.5 \text{ A}$$

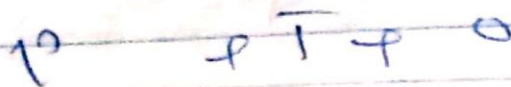
Sol

As in above Circuit
 5Ω & 5Ω are in series
So

$$R_{eq} = 5\Omega + 5\Omega$$

$$R_{eq} = 10\Omega$$

So Circuit become,

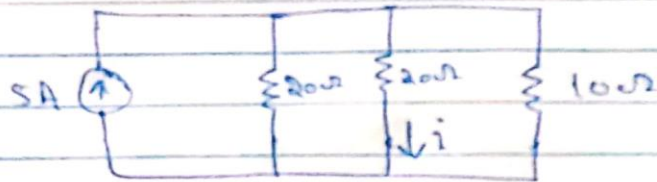


Name: ASHFACS AHMAD
Reg No: 19PWCE1795

Page No: 2

Day: MTWTFSS

Date: ___/___/___



Now again 20Ω & 10Ω are in parallel So

$$\frac{1}{R_{eq}} = \frac{1}{20} + \frac{1}{10}$$

$$\frac{1}{R_{eq}} = \frac{1+2}{20}$$

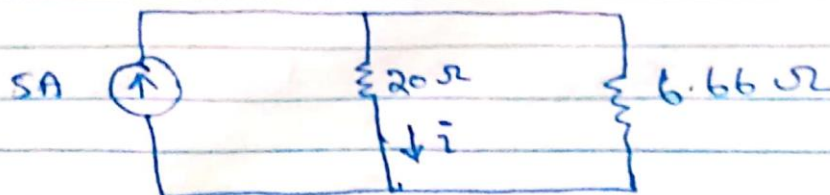
$$\frac{1}{R_{eq}} = \frac{3}{20}$$

$$\frac{1}{R_{eq}} = 0.15$$

$$R_{eq} = \frac{1}{0.15}$$

$$R_{eq} = 6.66\Omega$$

Now circuit becomes



Name ASHFAR AHMAD
Reg No: 19PCCE1795

Page No: 3

Day: MTWTFSS

Date: ___/___/___

Now circuit become Simple.

As 20Ω & 6.66Ω are in parallel, so we can apply current division rule to find out i across 20Ω .

As current division rule across 20Ω is,

$$i = 5A \left(\frac{6.66}{20 + 6.66} \right)$$

$$i = 5A \left(\frac{6.66}{26.66} \right)$$

$$i = 5A(0.25)$$

$$\boxed{i = 1.25}$$

Hence we verified that there is typo error so the value of i is not $2.5A$. The correct value is $1.25A$.

— xx — xx — xx — xx

Name: ASHFAR AHMAD
Reg NO: 19PWCE1795

Page No: (4)

Day: MTWTFSS

Date: ___/___/___

Answer NO : 2

Circuit Question.

Given:

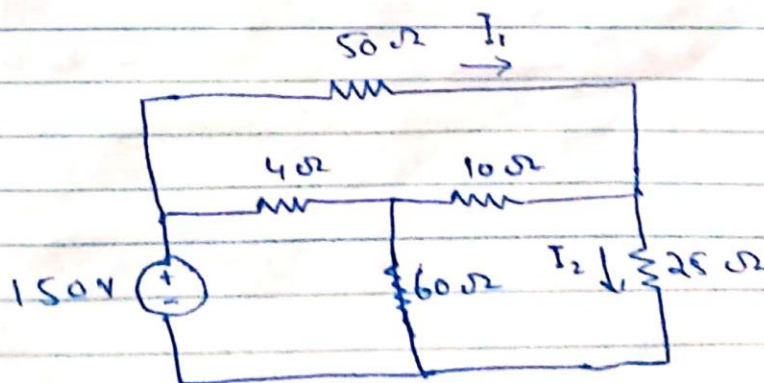
$$\text{Current} = I_1 = 1 \text{ A}$$

$$\text{Resistance} = R_1 = 50 \Omega$$

$$\text{Voltage} = V_1 = 150 \text{ V}$$

Sol

Here we cannot apply $P = I^2 R$ b/c circuit is not like a parallel circuit.
So Power on Resistor 50Ω is



P P T P O

Name: ASHFAT AHMED
Reg No: 19PWCSE1795

Page NO: (5)

Day: MTWTFSS

Date: ___/___/___

$$P = \frac{V^2}{R} \rightarrow \text{This for parallel}$$

As

$$V = 150V \quad \& \quad R = 50\Omega \quad \text{So}$$

$$P = \frac{(150)^2}{50}$$

$$P = \frac{150 \times 150}{50}$$

$$P = 150 \times 3$$

$$P = 450 \text{ watts}$$

Ans

— x x — x x — x x — x

NAME: ASHFAQS AHMAD
Reg No: 19PWCE1795

Page No: (6)

Date: ___/___/___

Day: MTWTFSS

Answer No: 3

a Design Problem *

Sol

The power and voltage required for e-bike are.

$$\text{Power} = P = 16 \text{ W}$$

$$\text{Voltage} = V = 110 \text{ V}$$

Given:

batteries = 12 V

resistors = any values.

First of all we find current I .

As

$$IV = P$$

$$I = P/V$$

$$I = \frac{16 \text{ W}}{110 \text{ V}}$$

$$I = 0.145 \text{ A}$$

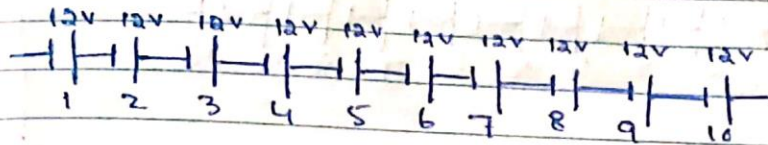
Name: HSHFAQ AHMAD
Reg No: 19PWCE1795

Page No: 7

Day: MTWTFSS

Date: / /

Now we will take 10
12V batteries and connect
them in series.



As in series voltages added
So

$$\text{Total Voltage} = 120V$$

As e-bike require 110V
So we will drop 10V using
Resistor.

So the value of R is,

$$IR = V$$

$$R = \frac{V}{I} \quad \text{As} \quad \begin{matrix} V = 10 \\ I = 0.145 A \end{matrix}$$

$$R = \frac{10}{0.145}$$

$$R = 68.96$$

P P T P O

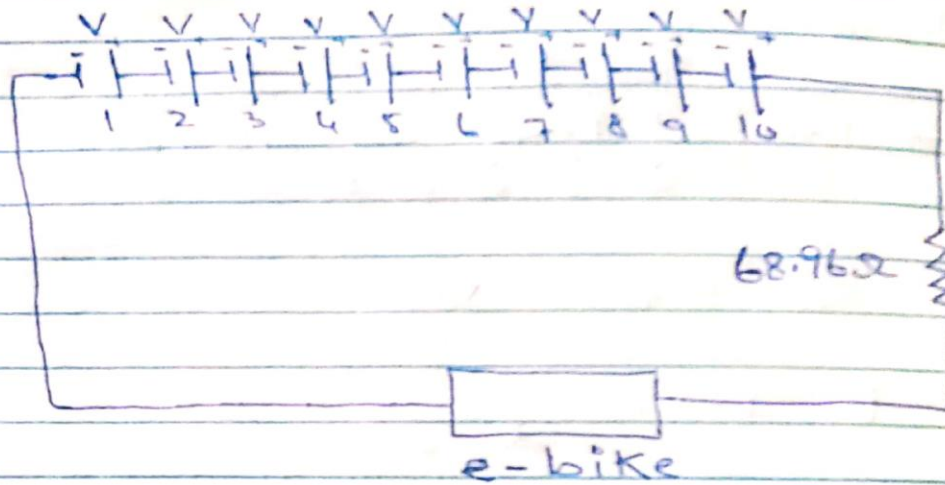
Name: ASHFAB AHMAD
Reg No: 19PWCSE1795

Page No: (8)

Day: MTWTFSS

Date: ___/___/___

$V = 12V$



xx — xx — xx — xx —

The END

The End