Principles of Automotive Electricity and Electronics
Time Allowed: 2hrs

Semester II

Final exam (2023)

Total Marks :(45 Marks)

Question (1) :

1- Explain with a sketch the effect of the capacitor in the rectifier circuit
2- Mention the benefit of the transformer and its main parts
3- Explain with a sketch the principal work of electromagnetic relay
4- What are inductors, and explain factors that affect the amount of inductance for a coil?
5- Describe the construction of the capacitor and show the effect of each part on the capacitance
6- What are the advantages of capacitor?

Question (2) : Choose the correct answer: -

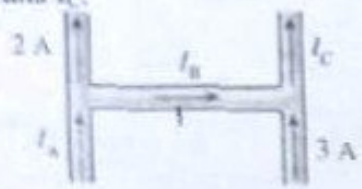
1- A cylindrical conductor conducts of length L and uniform area of cross-section A has resistance R. Another conductor of length 2L and resistance R of the same material. The area of cross-section is:

a- $A/2$ b- $3A/2$ c- $3A$ d- $2A$

2- The resistivity does not change if :

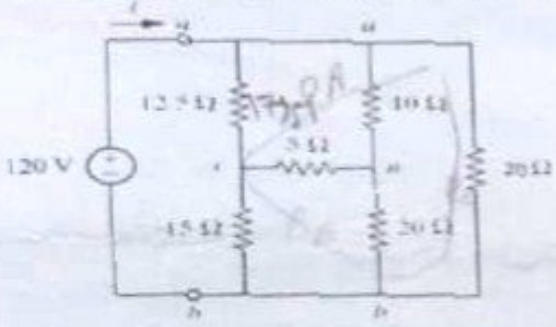
a- The material is changed b- The temperature is changed
c- The shape of the resistor is changed d- Both material and temperature are changed

3- The wires showed next carry currents as noted. Rate the currents I_A, I_B, and I_C.



a- $I_A > I_B > I_C$
b- $I_B > I_A > I_C$
c- $I_C > I_A > I_B$
d- $I_A > I_C > I_B$

4- The equivalent resistance R_{ab} for the given circuit is



a-10.2 Ω
b-8.3 Ω
c-9.6 Ω
d-9.1 Ω

5- What is the maximum resistance which can be made using five resistors each of 0.5 Ω?

a- 2.5 Ω b- 1 Ω c- 10 Ω d- 5 Ω

Bani Swief Technological University

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6- In the circuit show in figure (1), the value of I_1 is:

a. $\frac{18}{5}$

b. $\frac{12}{5}$

c. $\frac{5}{12}$

d. $\frac{10}{5}$

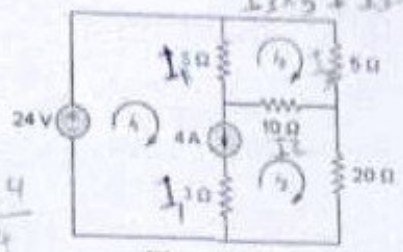


Figure (1)

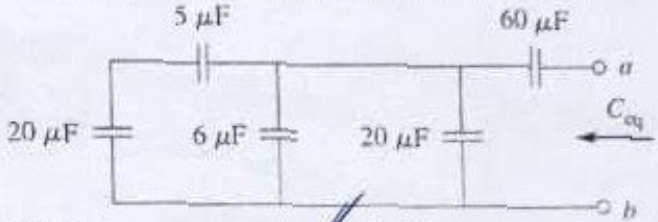
7- In the circuit show in figure (1), the value of I_2 is:

a- $\frac{28}{15}$ b- $-\frac{28}{20}$ c- $\frac{28}{20}$ d- $-\frac{18}{15}$

8- In the circuit show in figure (1), the value of I_3 is:

a- $-\frac{8}{5}$ b- $\frac{4}{5}$ c- $\frac{5}{4}$ d- $-\frac{4}{5}$

9- The equivalent capacitance seen between terminals a and b of the circuit is



a- 30 μF b- 22 μF c- 20 μF d- 18 μF

1- اشرح مع الرسم تأثير المكثف في دائرة توحيد التيار

2- اذكر فائدة المحول وأجزائه الرئيسية (الترانسفورمر)

3- اشرح مع الرسم الوظيفة الرئيسية للمرحل الكهرومغناطيسي

4- ما هي الملفات ، واشرح العوامل التي تؤثر على مقدار الحث للملف؟

5- وضح تركيب المكثف مع توضيح تأثير كل جزء على السعة

6- ما هي مميزات المكثف

Best Wishes ..... تمنياتي بالتوفيق

Dr. Mohammed Ratie