বাংলাদেশ আর্মি ইন্টারন্যাশনাল ইউনিভার্সিটি অব সায়েন্স এন্ড টেকনোলজি (বিএআইইউএসটি), কুমিল্লা
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Department of Electrical and Electronic Engineering
Level-I, Term-I
Mid Term Examination, Spring-2023
Course Code: EEE 111
Course Title: Electrical Circuits I

Notes: **Time: 1 Hour**

a. Each question carries 30 marks. **Full Marks: 60**

b. Figure on the right of each question indicate marks for respective question.

c. Answer any two questions including question no.-1

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1. a. From the following data table, determine the resistance of each device and discuss on which device conductivity level is higher. Consider, resistivity $\rho = 1\Omega m$ for all devices. **(10)**

Device	Length, l (m)	Area, A (m^2)
A	1	0.52
B	2	0.96
C	3	1.5
D	4	1.01
E	5	0.83

b. Determine the voltage v_o and the current i in the circuit given in Fig. 1(b). **(15)**

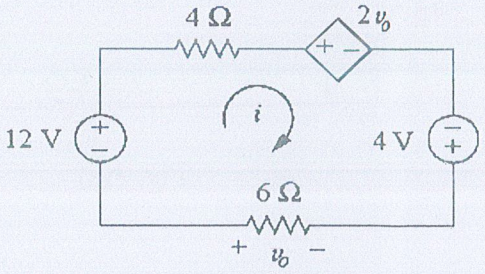

Fig. 1(b)

c. Show That, $P = VI$ **(5)**

[Here, symbols are indicating the usual meaning]

2. a. A house has the following electrical appliance usage: **(20)**

- Two 9-watt fluorescent lamp used for 4 hours per day
- One 60-watt fan used for 2 hours per day
- One 0.75 kilo-watt refrigerator that runs 24 hours per day with compressor that runs 12 hours and remains off 12 hours.
- One 0.6 hp water pump used 30 minutes per day.

If the per unit cost 7tk, determine the ***cost of January, 2022 to February, 2022.***

b. Determine the resistance R_{eq} seeing into the terminal a-b given in Fig. 2 (b) **(10)**

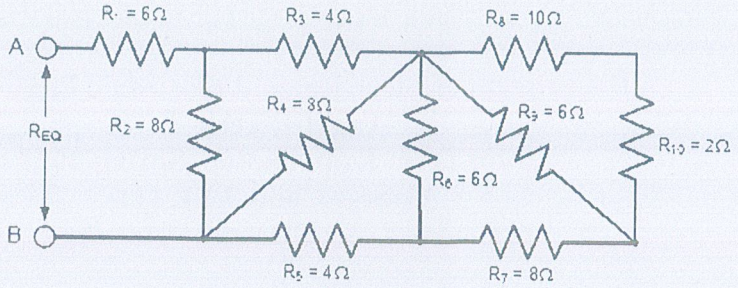

Fig. 2 (b)

3. a. Derive ***Ohm's Law*** **(5)**

b. Derive the parallel resistance and current divider rule of the following circuit in Fig. 3(b): **(15)**

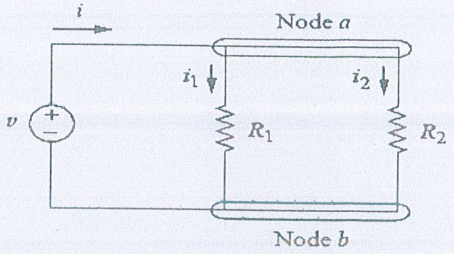

Fig. 3(b)

c. Using Voltage divider rule find the voltage drop of all branches of the following circuit in Fig. 3 (c), also show that, supply voltage =drop voltage **(10)**

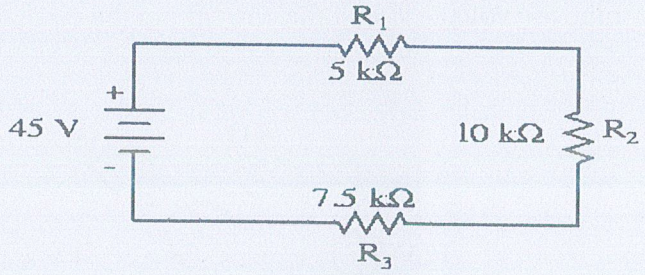

Fig. 3(c)