

# Circuits I – Assignment

## 01

### Basic Concepts

#	Student ID	Student Name	Grade (10)	Instructor signature
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Delivery Date	
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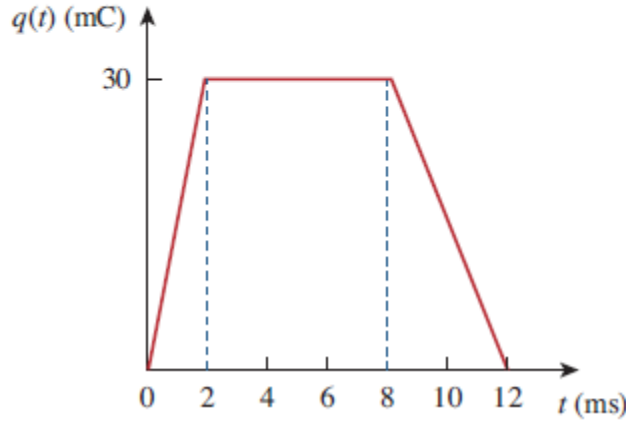
١. يتم تسليم التمرين محلولا في خلال أسبوعا من تاريخ التمرين، و يتم حذف درجتين من التمرين عن كل أسبوع تأخير
٢. يتم التسليم للسيد المهندس معيد المقرر مباشرة
٣. تتم أجابه التمرين في نفس ورق الأسئلة



Q1

1.6 The charge entering a certain element is shown in Fig. 1.23. Find the current at:

- (a)  $t = 1$  ms    (b)  $t = 6$  ms    (c)  $t = 10$  ms



Sol 1

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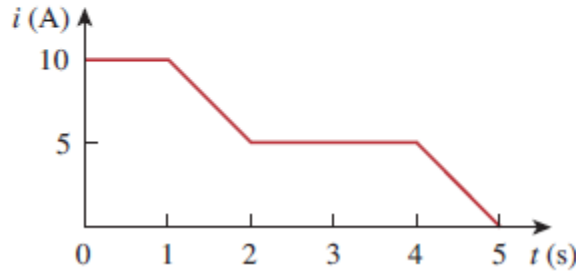


Q2

1.9 The current through an element is shown in Fig. 1.26.

Determine the total charge that passed through the element at:

- (a)  $t = 1$  s      (b)  $t = 3$  s      (c)  $t = 5$  s



Sol 2

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Q3	<p>1.14 The voltage <math>v</math> across a device and the current <math>i</math> through it are</p> $v(t) = 10 \cos 2t \text{ V}, \quad i(t) = 20(1 - e^{-0.5t}) \text{ mA}$ <p>Calculate:</p> <p>(a) the total charge in the device at <math>t = 1</math> s</p> <p>(b) the power consumed by the device at <math>t = 1</math> s.</p>
Sol 3	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>



Q4

1.15 The current entering the positive terminal of a device is  $i(t) = 6e^{-2t}$  mA and the voltage across the device is  $v(t) = 10di/dt$  V.

- (a) Find the charge delivered to the device between  $t = 0$  and  $t = 2$  s.
- (b) Calculate the power absorbed.
- (c) Determine the energy absorbed in 3 s.

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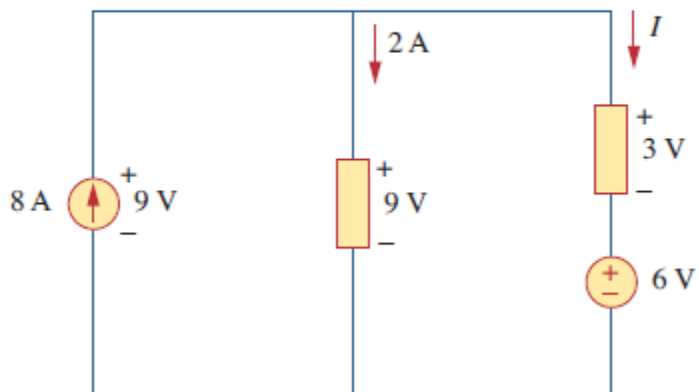
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Q5

1.19 Find  $I$  and the power absorbed by each element in the network of Fig. 1.30.



Sol 5

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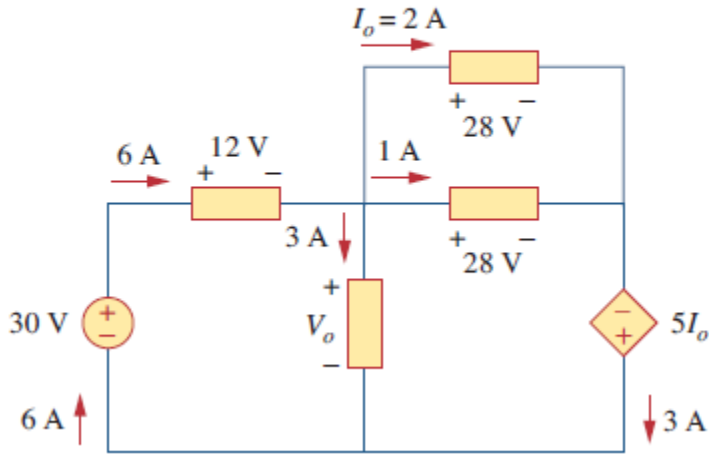
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Q6

1.20 Find  $V_o$  and the power absorbed by each element in the circuit of Fig. 1.31.



Sol 6

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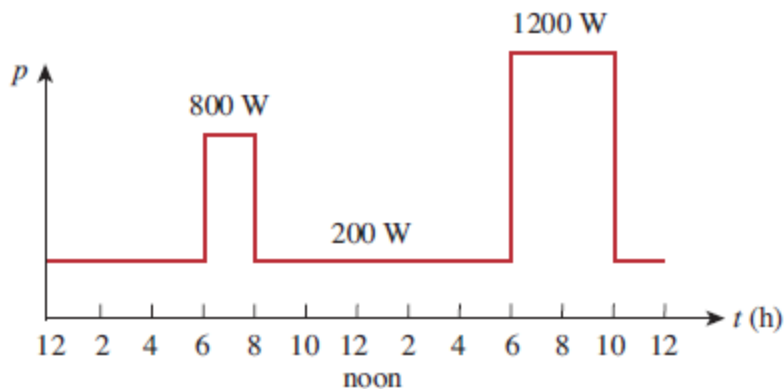
Q8	<p>1.23 A 1.8-kW electric heater takes 15 min to boil a quantity of water. If this is done once a day and power costs 10 cents/kWh, what is the cost of its operation for 30 days?</p>
Sol 8	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>



Q9	<p><b>1.31</b> In a household, a 120-W personal computer (PC) is run for 4 h/day, while a 60-W bulb runs for 8 h/day. If the utility company charges \$0.12/kWh, calculate how much the household pays per year on the PC and the bulb.</p>
Sol 9	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

Q10

1.34 Figure 1.32 shows the power consumption of a certain household in 1 day. Calculate:  
(a) the total energy consumed in kWh,  
(b) the average power per hour over the total 24 hour period.



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Q 1 1	1.37 A 12-V battery requires a total charge of 40 ampere-hours during recharging. How many joules are supplied to the battery?
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Q 1 2	<p>1.39 A 600-W TV receiver is turned on for 4 h with nobody watching it. If electricity costs 10 cents/kWh, how much money is wasted?</p>
S ol 1 2	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>