PSC-436 Quiz # 5

Name:

Date:

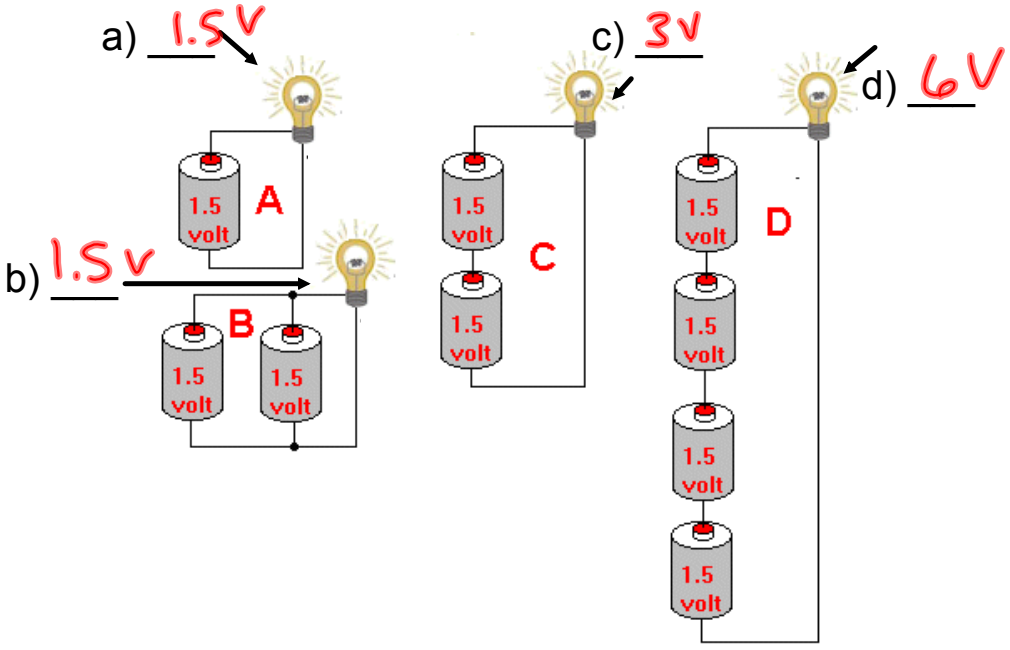
1. Determine the voltage being supplied to each of the lights below:

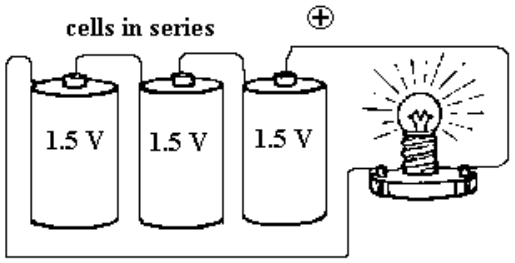
a) 1.5V

b) 1.5V

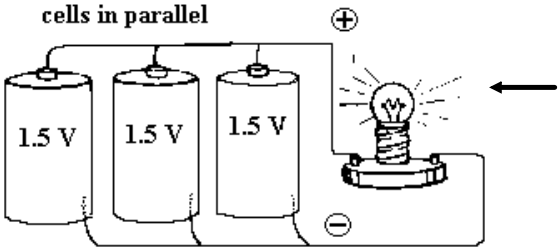
c) 3V

d) 6V



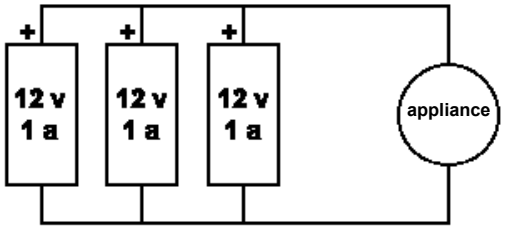


e) 4.5 V



f) 1.5V

2. a) What is the voltage supplied to the electrical appliance below?



Answer: 12V

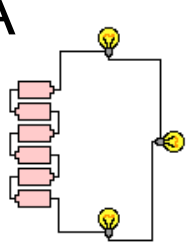
b) What is the benefit of using three batteries in this circuit instead of one?

Answer: Will last longer

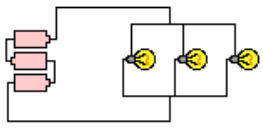
3. a) Three light bulbs are on in a circuit. If one of the bulbs burns out, the other bulbs stay lit. Which of the following circuit diagrams (A or B) could represent this circuit?

Answer: B

A



B



b) Explain your answer Parallel Circuit

4. a) An air conditioner draws a 220A current, and operates at 120V. What is the power dissipated by the air conditioner? Any relevant equations must be shown!

① $P = V I$

$P = (120V)(220A)$

$P = 26400W$

b) If the casing on this air conditioner is made of metal, what type of prong (two-prong or three-prong) is it required to have by law?

Answer: 3-prong

Explain why: Acts as a ground

5. a) A hydroelectric generating station produces electricity at a voltage of up to 13,800V. The voltage is then increased by step-up transformers outside the station. The voltage is increased to anywhere from 44,000V - 765,000V in preparation for transport over long distances. Why is electricity carried long-distances through power lines at such high voltages?

Answer: To reduce power loss due to the Joule Effect. ①

b) Explain, referring to any relevant equations.

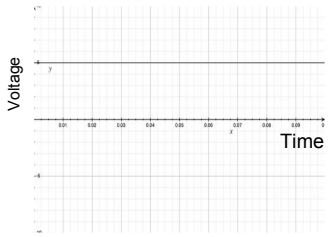
① ② ①

Power carried (constant) → $P = V I$ ↑V means ↓I

Power lost to Joule Effect → $P = I^2 R$ ↓I ∴ ↓↓ P lost

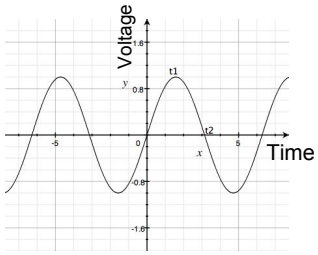
6. Place **AC** or **DC** in each space below to indicate which type of current is being referred to:

a) The voltage of this type of current varies over time as follows:



Ans: DC

b) The voltage of this type of current varies over time as follows:



Ans: AC

c) Its frequency is 60 hertz in the Hydro-Quebec system. Ans: AC

d) It is used to operate ipods and certain toys. Ans: DC

e) It is used to operate household appliances. Ans: AC

f) The root mean square value of its intensity is used when calculations are involved. Ans: AC

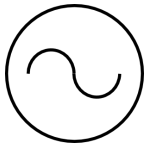
rms (average) (effective value)

g) Its current always travels in the same direction. Ans: DC

h) Its current changes direction on a regular basis. Ans: AC

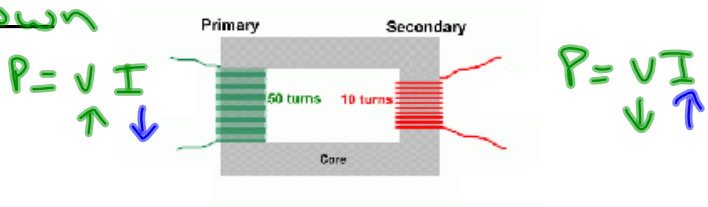
i) The following symbol is used to represent this type of current:

Ans: AC



7. a) Is the transformer shown a step-up or step-down transformer?

Answer: Step down



b) How do you know? Less coils in secondary

c) Is the current intensity at the input greater than, less than, or equal to the current intensity at the output? Less than

d) Is the potential difference at the input greater than, less than, or equal to the potential difference at the output? Greater than