ELT 101: Basic Electricity: AC/DC

Unit 9 Exam: Series-parallel Circuits
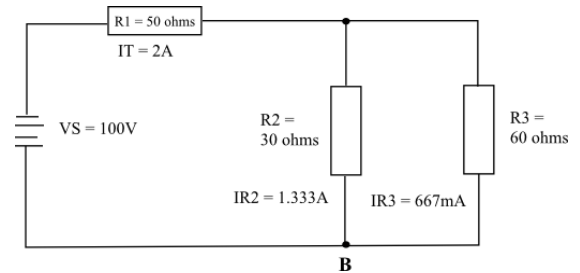
NAME_____

DATE _____

Circle the most correct answer (2 points each for a total of 20 points)

1)   A series-parallel circuit is a combination of

      A.   components connected end to end

      B.   series (one-path) circuits

      C.   both series and parallel circuits

      D.   parallel (two or more path) circuits

2)   Referring to the circuit at right, what is the current flowing out of node B?

      A. 887 mA

      B. 1.33 A

      C. 667 mA

      D. 2 A

R1 = 50 ohms
IT = 2A
VS = 100V
R2 = 30 ohms
R3 = 60 ohms
IR2 = 1.333A   IR3 = 667mA
B

3)   Referring to the circuit above, what is the total circuit power?

      A. 20mW

      B. 20 watts

      C. 200mW

      D. 200 watts

4)   When calculating R_T in a complex series-parallel circuit, it is best to start:

      A. as far away as possible from the voltage source

      B. in the middle of the circuit

      C. as close to the voltage source as possible

      D. working with parallel combinations first

5)   Any series-parallel circuit can be simplified into a _____ and a _____.

      A.   voltage source, equivalent resistance

      B.   current source, voltage divider

      C.   resistance, power rating

      D.   power rating, battery

6) The toughest part of analyzing series-parallel circuits is:

      A. using the trigonometry involved

      B. determining what's in series and what's in parallel

      C. calculating power

      D. none of the above

7) The simplest technique to identifying series and parallel components is to:

      A. flow voltage

      B. flow current

      C. use Ohm's Law

      D. guess

8) In a series circuit the sum of the individual voltage drops must equal the applied voltage.

      A. true

      B. false

List the five steps in the five-step method of analyzing a series-parallel circuit

    (5 points total)

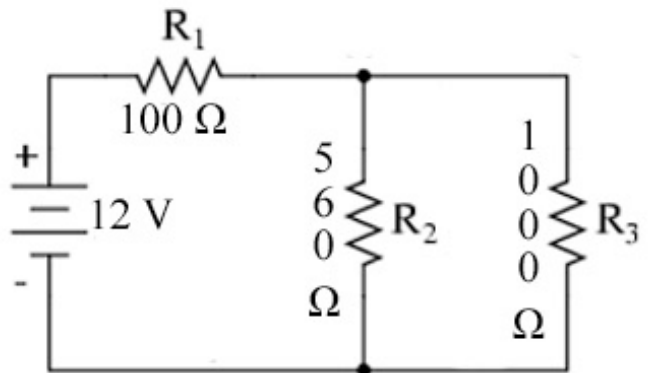   Step 1: _____

    Step 2: _____

    Step 3: _____

    Step 4: _____

    Step 5: _____

Solve the following. Make sure to show your work!

1) In the circuit below, solve for R_T, I_T, I_{R1}, I_{R2}, V_{R1}, V_{R2} and V_{R3} (3 points each for a total of 21 points)

Series-parallel
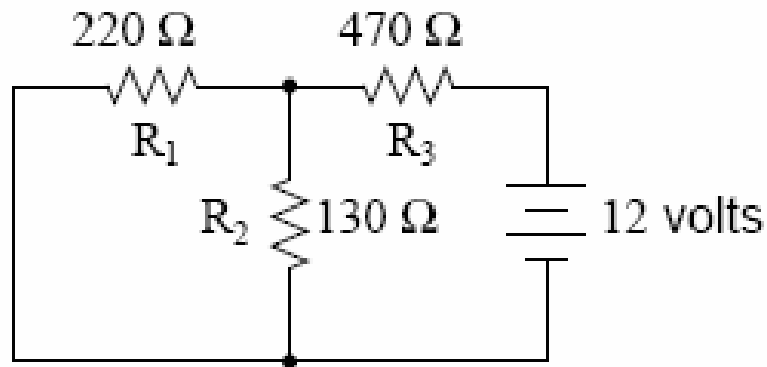
$R_T = $ _____

$I_T = $ _____

$I_{R1} = $ _____

$I_{R2} = $ _____

$V_{R1} = $ _____

$V_{R2} = $ _____

$V_{R3} = $ _____

R₁
100 Ω
+
12 V
560 Ω   R₂
1000 Ω   R₃

2) In the circuit shown below, what are the voltage drops across R1, R2 and R3 assuming R2 is shorted? (6 points total).

With R2 shorted	Voltage
R1	
R2	
R3	

Points possible:

Multiple choice: 18

Fill in the blank   5

Problems: 30

                               50

***** end of unit 9 exam *****