1. [A] One of the following circuits is a series circuit and the other is a parallel circuit. Explain which is which.

2. [B] Find the power absorbed by each of the subcircuits A and B given that the voltage and current are 10 V and 2 A as shown.

3. [B] For each of the four circuits below, find the power absorbed by the voltage source \( P_V \), the power absorbed by the current source \( P_I \) and the total power absorbed \( P_V + P_I \).

4. [B] Determine the voltage \( V_X \) in the following circuit.

5. [B] Determine the current \( I_X \) in the following circuit.

6. [B] What single resistor is equivalent to the three resistor sub-circuit shown below?
7. [B] What single resistor is equivalent to the three resistor sub-circuit shown below?

8. [C] What single resistor is equivalent to the five resistor sub-circuit shown below?

9. [A] If a resistor has a conductance of 8 μS, what is its resistance?

10. [B] Determine the voltage across each of the resistors in the following circuit and the power dissipated in each of them. Calculate the power supplied by the voltage source.

11. [B] Determine the current through each of the resistors in the following circuit and the power dissipated in each of them. Calculate the power supplied by the current source.

12. [B] Determine $R_1$ so that $Y = \frac{1}{4} X$.

13. [B] Choose $R_1$ and $R_2$ so that $Y = 0.1X$ and $R_1 + R_2 = 10 \, \text{MΩ}$.

14. [D] You have a supply of resistors that have the values $\{10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82\} \times 10^n \, \text{Ω}$ for all integer values of $n$. Thus, for example, a resistor of 390 Ω is available and the next higher value is 470 Ω. Show how, by combining two resistors in each case, it is possible to make networks whose equivalent resistance is (a) 3 kΩ, (b) 4 kΩ and (c) as close as possible to 3.5 kΩ. Determine is the worst case percentage error that might arise if, instead of combining resistors, you just pick the closest one available.