

A+ Core 1 and Core 2 CertMaster Perform 15.0

4.6.6 Exercise: Power Supply Wattage Calculation Capstone

Learning Outcomes and Exam Objective

By completing this exercise, you will:

- Calculate the minimum wattage required for a computer system.
- Identify the importance of selecting a PSU with adequate wattage and efficiency ratings.
- Determine the role of a PSU in maintaining system stability and protecting hardware components.

This exercise supports the understanding of the following objective for the A+ Core 1 (220-1201) Exam:

- 5.1 Given a scenario, troubleshoot motherboards, RAM, CPU, and power.

Instructions

This exercise is designed to help you understand how to calculate the required wattage for a computer system. You will complete a wattage calculation and write a paper on the Power Supply Unit (PSU). Through this activity, you will explore the importance of selecting a PSU with adequate power and efficiency ratings to ensure system stability and longevity.

For this activity, you will:

1. Review the following list of computer components. These components are the parts of a typical computer system that require power.
 - a. CPU (Central Processing Unit): Intel Core i7-12700K.
 - b. GPU (Graphics Processing Unit): NVIDIA GeForce RTX 3060.

c. RAM (Memory): 16GB DDR4 (2 x 8GB).

d. Storage Devices:

i. 1 x 1TB SSD.

ii. 1 x 2TB HDD.

e. Motherboard: ATX motherboard.

f. Cooling System: 1 CPU cooler and 3 case fans.

g. Peripherals: Keyboard, mouse, and monitor (optional for calculation).

2. Calculate the required wattage using one of the following options:

○ Option 1: Use an online PSU calculator:

- Visit a trusted online PSU calculator (e.g., OuterVision, Cooler Master, or PCPartPicker).
- Input the list of computer components into the calculator.
- Record the minimum wattage recommendation provided by the tool.

○ Option 2: Perform a manual calculation:

- Research the power consumption (in watts) for each computer component. For example, the CPU is approximately 125 W, the GPU is approximately 170 W, the RAM is approximately 10 W per stick, the SSD is approximately 5 W, the HDD is approximately 10 W, the Motherboard is approximately 50 W, and the cooling system is approximately 5 W per fan.
- Add up the wattage of all the computer components.
- Multiply the total by 1.2 (to account for power spikes and future upgrades).

3. Write a paper (1 to 2 pages) that includes answers to the following questions:

- What is a PSU with a wattage rating of at least 20% to 30% higher than the calculated requirement for your system? For example, if your system requires 400 W, choose a PSU rated for at least 500 W so you ensure headroom upgrades and peak loads.
- What is a PSU with an 80 PLUS certification (e.g., Bronze, Silver, Gold, Platinum, or Titanium)?
- Discuss the risks of using an underpowered or low-quality PSU, such as system instability, hardware damage, or reduced lifespan.

- Why is it important to calculate the required wattage for a computer system accurately?
- What are the potential risks of using a PSU with insufficient wattage?
- How does PSU efficiency impact energy consumption and system performance?

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