✓ **Congratulations! You passed!**

Grade received 100%

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1. If two tasks are executing in parallel, which of the following statements is true?   **1 / 1 point**

   ○ They are using exactly the same hardware at the same time.

   ● They are using different hardware, but running at the same time.

   ○ Their executions are alternating in time.

   ○ One task executes immediately after the other finishes.

   ✓ **Correct**
   Correct!

2. What does the von Neumann bottleneck state about computer architectures?   **1 / 1 point**

   ○ Power consumption is a limiting factor for performance.

   ○ Temperature is a performance bottleneck.

   ○ Clock frequency cannot be improved without considering temperature.

   ● Memory access time is a performance bottleneck.

   ✓ **Correct**
   Correct!

3. What does Moore's law directly observe?   **1 / 1 point**

   ○ Power consumption doubles every 18 months.

   ● Transistor density doubles every 2 years.

   ○ Processor power doubles every 2 years.

   ○ Transistor switching delay is cut in half every year.

   ✓ **Correct**
   Correct!

4. How is dynamic power consumption related to voltage swing?   **1 / 1 point**

   ● Dynamic power is proportional to the square of the voltage swing.

   ○ Dynamic power is proportional to the cube of the voltage swing.

   ○ Dynamic power is proportional to the square root of the voltage swing.

   ○ Dynamic power is proportional to the capacitance.

   ✓ **Correct**
   Correct!

5. Why can't Dennard Scaling continue forever?   **1 / 1 point**

   I. The speed of light limits the potential performance improvements.

   II. Voltage must remain above threshold voltage.

   III. Some noise margin must be maintained.

   ○ *I* only.

   ○ *I* and *II*, NOT III.

   ● *II* and *III*, NOT *I*.

   ○ *I*, *II*, and *III*.

   ✓ **Correct**
   Correct!

6. What factor limits clock rates in future designs?   **1 / 1 point**

   I. The speed of light.

   II. Excessive power consumption.

   III. Excessive temperature.

   ○ *I* only.

   ○ *I* and *II*, NOT *III*.

   ○ *II* and *III*, NOT *I*.

   ● *I*, *II*, and *III*.

   ✓ **Correct**
   Correct!

7. One benefit of concurrent execution on a single processor is that it can hide latency. What does this mean?   **1 / 1 point**

   ○ When tasks execute in parallel, only the delay of the slowest task matters.

   ● One task can execute while another task is waiting on something.

   ○ The concurrent execution time of two tasks is less than the sum of their sequential execution times.

   ○ Total latency is reduced because two tasks can execute at the same time.

   ✓ **Correct**
   Correct!