Worksheet: Units of Measure in Computing

Name: _____ **Date:** _____

Class: _____

Part 1: Bits and Bytes

1. **Define the following terms:**
   a) **Bit:**

   _____

   b) **Byte:**

   _____

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2. **Fill in the blanks:**
   o **1 byte** = _____ bits
   o **1 kilobyte (KB)** = _____ bytes (binary system)
   o **1 gigabyte (GB)** = _____ megabytes (binary system)

3. **Explain the difference between bits and bytes in real-life contexts (e.g., network speed vs. file size):**

   _____

   _____

4. **If a file is 8 MB in size, how many bits does it contain?**
   Show your work:

   _____

Part 2: Binary Combinations

5. **Complete the table showing possible combinations of 2 bits and their decimal values:**

First Bit	Second Bit	Decimal Value
0	0	
0	1	
1	0	
1	1	

6. **How many unique combinations are possible with 3 bits?**

_____

Part 3: Data Storage Units

7. **Match the unit to its size:**

Unit	Number of Bytes
Kilobyte (KB) a) 1,000 bytes	Kilobyte (KB) a) 1,000 bytes
Megabyte (MB) b) 1 trillion bytes	Megabyte (MB) b) 1 trillion bytes
Gigabyte (GB) c) 1 million bytes	Gigabyte (GB) c) 1 million bytes
Terabyte (TB) d) 1 billion bytes	Terabyte (TB) d) 1 billion bytes
Petabyte (PB) e) 1 quadrillion bytes	Petabyte (PB) e) 1 quadrillion bytes

Answers:

- KB: _____
- MB: _____
- GB: _____
- TB: _____
- PB: _____

8. **If a hard drive is advertised as 2 TB, how many bytes of storage does it provide (in the decimal system)?**

Part 4: Data Throughput

9. **Define data throughput and explain why it's important in networking:**

10. **Circle the correct unit for measuring network speed:**
    a) Gigabytes per second (GBps)
    b) Megabits per second (Mbps)
    c) Kilobytes per second (KBps)

11. **A user transfers 10 GB of data over a network in 500 seconds. What is the data throughput in MBps?**
    Show your work:

Part 5: Processor Speed

12. **Define processor speed and explain how it is measured:**

13. **A CPU has a clock speed of 4.2 GHz. How many cycles per second does it complete?**

14. **Explain why a higher clock speed doesn't always mean better performance:**

Part 6: Short Answer Questions

15. **What is cache memory, and how does it improve CPU performance?**

_____

_____

16. **What is parallelism, and why is it important in computing?**

_____

_____

17. **List two factors that affect data throughput:**
   a) _____
   b) _____

Bonus Question

What is overclocking, and what are the risks involved?

_____

_____

_____