1. Fill in the blanks

|  |  |  |
| --- | --- | --- |
| **Hexadecimal** | **Decimal** | **Binary** |
|  |  | 01111011 |
|  |  | 01110001 |
|  |  | 00111100 |
|  |  | 01111010 |
| 0x8d |  |  |
| 0x5 |  |  |
| 0xef |  |  |
|  | 93 |  |
|  | 56 |  |
|  | 110 |  |

2. Fill in the blanks. For example, 32 bits can address 4Gigabytes of memory.

|  |  |
| --- | --- |
| **Address bits** | **Size of Memory** |
| 45 |  |
| 30 |  |
| 48 |  |
| 27 |  |
| 43 |  |
|  | 4 Terabytes |
|  | 2 Kilobytes |
|  | 256 Gigabytes |
|  | 128 Terabytes |
|  | 4 Megabytes |

3. Calculate which machine is faster, by what factor, and by what percent

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **A run time (sec)** | **B run time (sec)** | **Faster machine** | **By factor** | **By percent** |
| 3.776 | 0.944 |  |  |  |
| 0.979 | 3.916 |  |  |  |
| 0.118 | 0.118 |  |  |  |
| 0.387 | 1.935 |  |  |  |
| 1.628 | 0.407 |  |  |  |

4. Calculate the effective CPI;

|  |  |  |  |
| --- | --- | --- | --- |
| **Inst Class** | **A** | **B** | **C** |
| CPI | 2 | 1 | 4 |
| Proportion | 1/4 | 1/2 | 1/4 |

5. Order the machines from fastest to slowest:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Machine** | **Instructions** | **CPI** | **Clock (GHz** | **Exec Time** |
| A | 1800 | 1.4 | 3.6 |  |
| B | 2000 | 2.3 | 1 |  |
| C | 1900 | 1.2 | 1.9 |  |
| D | 1200 | 2.8 | 1.2 |  |

\_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_\_

(fastest) (slowest)

6. If a problem is 90% parallelizable. How many processors are needed to speed up the problem by a factor of 5?

7. If a problem is 80% parallelizable, what is the maximum speedup that can be obtained (with infinite processors)?

8. What percent of a problem must be parallelizable so that 10 processors would speed up the problem by a factor of 4?