

No E-Mail submissions will be accepted.  
Submission formats and file naming:

File name :Pts\_firstName\_lastName\_lab\_1

File format: pdf or MS Word format

e.g. Pts\_Donald\_Trump\_lab\_1.pdf

**Reading materials**

Use the following link and write a one page summary about the movie.

|  |
| --- |
| **The Transistor: a 1953 documentary, anticipating its coming impact on technology**  <https://www.youtube.com/watch?v=V9xUQWo4vN0&ab_channel=AT%26TTechChannel> |

**1.Order** the following architectural layers from **lowest to highest**:

|  |  |  |
| --- | --- | --- |
| Operating System |  | Highest |
| Digital Logic |  |  |
| Assembly Language |  |  |
| Problem Oriented Language |  |  |
| Microarchitecture |  |  |
| Instruction Set Architecture |  | Lowest |

**2.**Explain each of the following terms in your own words:

a. Translator

b. Interpreter

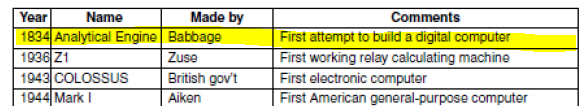
**3.**Can you imagine any multilevel computer in which the device level and digital logic levels were not the lowest levels? Explain.

**4.**Identify the mechanism that is used by the following programing languages to convert a source file to the machine language code:

|  |  |  |
| --- | --- | --- |
| Java, C++, PHP, Python | Translator | Interpreter |
| C, JavaScript |  |  |
|  |  |  |
|  |  |  |

**5.** In what sense are hardware and software equivalent? In what sense are they not equivalent?

**6.**Babbage’s difference engine had a fixed program that could not be changed. Is this essentially the same thing as a modern CD ROM that cannot be changed? Explain your answer.



**7.** Consider a computer with identical interpreters at levels 1, 2, and 3. It takes an interpreter n instructions to fetch, examine and execute one instruction. A level 1 instruction takes k nanoseconds to execute. How long does it take for an instructions at levels 2, 3 and 4?

**8.**Draw a diagram for the Von Neumann Machine.

**9.** Name two ways that a program written at a given architectural layer can be converted for execution by a lower layer.