

## Part 1: Theoretical Understanding (40%)

### AI Software Tools and Frameworks

**Q1:** Explain the primary differences between TensorFlow and PyTorch. When would you choose one over the other?

#### **TensorFlow**

Developed by google

Best for production ready

Graph based execution

This makes it suitable for large-scale deployment

#### **PyTorch**

Developed by Facebook

Best for research and prototyping

Dynamic computation graph

**Q2:** Describe two use cases for Jupyter Notebooks in AI development.

#### **Interactive experimentation:**

You can test small parts of your code step-by-step

#### **Data visualization & storytelling:**

Display graphs, images, and markdown which is ideal for **explaining insights** clearly.

## Q3: spaCy vs Basic Python String Operations

Basic string ops (like `.split()` or `.find()`) can only handle **literal text**.

spaCy adds **linguistic intelligence** — it knows grammar, context, and meaning.

- It provides:

Tokenization, Part-of-speech tagging, Named Entity Recognition (NER), Dependency parsing

spaCy turns plain text into structured, machine-understandable info — way beyond what `.split()` can do