

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