Question 1: Cloud Computing for Deep Learning

i) Define elasticity and scalability in the context of cloud computing for deep learning.

ii) Compare AWS SageMaker, Google Vertex AI, and Microsoft Azure Machine Learning Studio in terms of their deep learning capabilities.

Ans:

i) Elasticity and Scalability in Cloud Computing for Deep Learning

- **Elasticity:** The ability of a cloud system to dynamically adjust resources based on workload demand, ensuring cost efficiency and performance optimization.
- **Scalability:** The capability to handle growing workloads by adding or upgrading resources, either vertically (increasing power of existing instances) or horizontally (adding more instances).

ii) Comparison of AWS SageMaker, Google Vertex AI, and Azure ML Studio

Feature	AWS SageMaker	Google Vertex AI	Azure ML Studio
Ease of Use	Requires AWS ecosystem familiarity	Integrated with Google Cloud	Intuitive, low-code options
AutoML Support	Yes (AutoPilot)	Yes (AutoML Tables, Vision, NLP)	Yes (Automated ML)
GPU/TPU Support	Yes (NVIDIA GPUs)	Yes (TPUs & GPUs)	Yes (GPUs)
Pricing Model	Pay-as-you-go, Spot Instances	Usage-based, free tier available	Pay-as-you-go, free tier available
Integration	AWS Lambda, S3, Redshift	BigQuery, Cloud Functions	Power BI, SQL Server
Best For	Enterprise AI, robust ML pipelines	AI research, AutoML, easy deployment	Business intelligence, ML integration