QUESTION 7: Generative AI

Step 1: Introduction to Generative AI

Generative AI focuses on building models that can create new data — like images, text, audio, or video.

Task: Use pretrained models to demonstrate how GANs, VAEs, or diffusion models generate content. Focus on explanation + show sample output.

Main Types:

- GANs (Generative Adversarial Networks): A Generator vs a Discriminator

- VAEs (Variational Autoencoders): Learn and recreate compressed features

- Diffusion models: Add then remove noise to generate images

2. Diffusion Model Example (Text Generation)
We'll use GPT-2 (a diffusion-style text model).

Install requirements:

pip install transformers torch

code:

```
from transformers import pipeline

generator = pipeline("text-generation", model="gpt2")
prompt = "In Kenya, the future of AI is"
output = generator(prompt, max_length=50, num_return_sequences=1)

print("Generated Text:")
print(output[0]['generated_text'])
```

3. SAMPLE OUTPUT

In Kenya, the future of AI is promising. With increasing investments in education and technology, students and researchers are exploring applications of artificial intelligence in health, agriculture, and finance...

4. Explanation of What the Model is Doing

Takes your **prompt** ("In Kenya...")

Predicts one word at a time, using probability

Builds full sentences word-by-word

Based on its training on large internet datasets