What is Generative AI?
a) AI that focuses on analyzing data
b) AI that generates new content or data
c) AI used for automating repetitive tasks
d) AI used for data storage

What is a Generative Adversarial Network (GAN)?
a) A network for data analysis
b) A type of neural network architecture for generative modeling
c) A network for fast data processing
d) A network for data encryption

What is the primary role of the 'discriminator' in a GAN?
a) To generate new data
b) To classify data as real or generated
c) To store data
d) To optimize network speed

What is 'Deepfake' technology?
a) A data encryption method
b) The use of AI to create realistic but fake audio or video content
c) A data storage technique
d) An algorithm for data analysis

What is the 'Transformer' model, often used in Generative AI?
a) A model for converting data types
b) A type of neural network architecture particularly effective in understanding sequential data
c) A model used for image transformation
d) A data compression algorithm

What is 'Style Transfer' in Generative AI?
a) Changing the formatting of a document
b) The technique of replicating the style of one image onto the content of another
c) A method for transferring files
d) A data visualization technique

What does 'Latent Space' refer to in Generative AI?
a) A storage space for data
b) An intermediate representation of data learned by a model
c) A virtual reality space
d) The space used for data transmission

What is the primary purpose of 'Autoencoders' in Generative AI?
a) To encrypt data
b) To automatically encode text
c) For dimensionality reduction and feature learning
d) For accelerating network performance

What is 'Variational Autoencoder' (VAE)?
a) A data encryption tool
b) A type of autoencoder used for data compression
c) A generative model that uses probabilistic encoders and decoders
d) A model for visual data only

What is 'BERT' in Generative AI?
a) A type of neural network for regression analysis
b) A database management system
c) A state-of-the-art language representation model
d) A data visualization tool

Which of the following is NOT a generative AI model?
A) Variational Autoencoder (VAE)
B) Convolutional Neural Network (CNN)
C) Generative Adversarial Network (GAN)
D) Autoregressive Model

Generative AI models are primarily used to:
A) Classify data into predefined categories
B) Generate new data that is similar to existing data
C) Optimize existing algorithms
D) Reduce overfitting in neural networks

Autoregressive models generate data by
A) Predicting the next data point based on previous ones
B) Using two neural networks in a game-like structure
C) Compressing and reconstructing data
D) Transforming a simple probability distribution

Which of the following is an example of an autoregressive model used for text generation?
A) WaveNet
B) GPT (Generative Pretrained Transformer)
C) CycleGAN
D) Pix2Pix

In a Variational Autoencoder (VAE), the model:
A) Learns to directly predict the next data point
B) Trains two networks simultaneously to generate data
C) Compresses data into a latent space and samples from it to generate new data
D) Transforms a simple distribution into a complex one

Which of the following is NOT an application of autoencoders?
A) Image synthesis
B) Anomaly detection
C) Text summarization
D) Data compression

In a GAN, what is the role of the discriminator?
A) To generate synthetic data

B) To detect and classify data
C) To evaluate if data is real or generated
D) To transform latent representations into realistic outputs

Which of the following is a popular application of GANs?
A) Audio wave generation
B) Style transfer in image generation
C) Text summarization
D) Reinforcement learning in games

Normalizing Flows are used to:
A) Enhance image resolution
B) Transform a simple probability distribution into a more complex one
C) Predict the next word in a sequence
D) Generate realistic audio

One key advantage of Normalizing Flows over VAEs and GANs is:
A) Ability to exactly compute data likelihoods
B) Use of reinforcement learning for generation
C) Compression and reconstruction of data
D) Simplicity in architecture

Large Language Models (LLMs) like GPT-3 are primarily used for:
A) Generating realistic images
B) Predicting the next word in a sequence
C) Enhancing voice quality in speech
D) Creating realistic 3D simulations

Which AI model architecture is most widely used for tasks like text translation and summarization?
A) Autoencoders
B) Transformers
C) Generative Adversarial Networks
D) Convolutional Neural Networks

Which of the following models is designed for generating audio and music?
A) CycleGAN
B) GPT
C) WaveNet
D) VAE

Voice synthesis models are used to
A) Generate new text
B) Enhance speech and generate human-like voices
C) Compress audio files
D) Predict the next sound in a sequence

In drug discovery, generative AI models are used to:
A) Enhance the resolution of molecular images
B) Generate potential molecular structures for new drugs

C) Train models to classify different diseases
D) Predict patient recovery rates

Which of the following is an application of AI in medical imaging?
A) Generating super-resolution medical scans
B) Predicting patient outcomes using autoregressive models
C) Simulating medical procedures with GANs
D) Summarizing medical reports with transformers

AI models like DeepArt are primarily used to:
A) Generate human-like voices
B) Create artworks by mimicking artistic styles
C) Translate text between languages
D) Generate realistic audio waveforms

In creative writing, AI assists authors by:
A) Generating completely original novels
B) Suggesting ideas, styles, and text structures
C) Writing technical documents from scratch
D) Summarizing research papers

Data augmentation with generative AI is used to:
A) Increase the amount of training data by generating synthetic samples
B) Generate 3D simulations for games
C) Enhance data security in financial applications
D) Create image-to-image translations

Generative AI models are used in simulation and modeling to:
A) Reduce computation time in simulations
B) Create realistic virtual environments and scenarios
C) Enhance real-time decision-making in control systems
D) Summarize simulation data for better analysis

The term "Generative AI" primarily refers to models that are designed to:
A) Classify existing data
B) Generate new data based on learned patterns
C) Optimize existing algorithms
D) Enhance computational efficiency

Which of the following is considered a significant milestone in the history of Generative AI?
A) The invention of the perceptron
B) The development of GANs in 2014
C) The introduction of convolutional neural networks (CNNs)
D) The creation of decision trees

Which of the following is NOT a type of generative AI model?
A) Generative Adversarial Networks (GANs)
B) Variational Autoencoders (VAEs)
C) Convolutional Neural Networks (CNNs)
D) Autoregressive Models

The primary components of a GAN architecture are:
A) Encoder and Decoder
B) Generator and Discriminator
C) Classifier and Regressor
D) Input and Output Layers

Generative AI can be applied in which of the following domains?
A) Healthcare
B) Art and Creativity
C) Music and Audio
D) All of the above

In drug discovery, generative AI is used to generate:
A) Patient data
B) Molecular structures
C) Clinical trial protocols
D) Medical imaging techniques

Large language models (LLMs) are primarily used for:
A) Image recognition
B) Data compression
C) Natural language processing tasks
D) Audio generation

Pre-training in LLMs involves:
A) Training on a small dataset
B) Fine-tuning the model for specific tasks
C) Training on a large corpus of text without specific labels
D) Generating new text based on input prompts

Variational Autoencoders (VAEs) are used to:
A) Classify data into categories
B) Generate data by sampling from a learned latent space
C) Enhance image resolution
D) Generate audio waveforms

The principle behind VAEs involves _____ learning a distribution over the latent space instead of a deterministic point.
Answer: probabilistically

One major challenge in evaluating generative models is:
A) The abundance of labeled data
B) The lack of a standard metric for quality assessment
C) The simplicity of model architecture
D) The ability to generate synthetic data

Common metrics used to evaluate generative models include:
A) F1 Score and Precision
B) Inception Score and Fréchet Inception Distance
C) Accuracy and Recall

D) ROC-AUC and Log Loss

Generative AI refers to models that are capable of _____ new data similar to the training data.
Answer: generating

The evolution of generative models has significantly progressed since the introduction of _____ in 2014.
Answer: GANs (Generative Adversarial Networks)

A GAN consists of two main components: the _____ and the discriminator.
Answer: generator

Variational Autoencoders (VAEs) learn to encode input data into a latent _____ for data generation.
Answer: space

Generative AI is widely used in _____ for tasks such as image synthesis and video generation.
Answer: art and creativity

In the healthcare domain, generative models are employed for _____ discovery by generating potential drug candidates.
Answer: drug

Large Language Models (LLMs) are typically trained using a method called _____ on large text corpora.
Answer: pre-training

Fine-tuning LLMs is essential for adapting them to _____ tasks such as sentiment analysis or translation.
Answer: specific

The training of VAEs involves optimizing a _____ loss that includes a reconstruction term and a KL divergence term.
Answer: variational

VAEs are beneficial in applications such as _____ synthesis, where new instances are generated based on learned features.
Answer: image

Evaluating generative models poses challenges due to the subjective nature of _____ quality assessment.
Answer: output

One common challenge is the difficulty in quantifying the _____ of generated outputs compared to real data.
Answer: diversity

The primary limitation of vanilla Seq2Seq models is their inability to:
A) Handle sequential data
B) Generate high-quality outputs
C) Access information from distant timesteps effectively
D) Train on large datasets

The attention mechanism in Seq2Seq models helps by:
A) Compressing the input into a fixed-size vector
B) Assigning different importance (weights) to different input tokens
C) Improving the speed of training
D) Replacing the encoder entirely

In an attention-based Seq2Seq model, the _____ produces the context vector by focusing on important parts of the input sequence.
A) Decoder
B) Encoder
C) Attention mechanism
D) Loss function

The transformer model primarily differs from earlier Seq2Seq models by:
A) Using only attention mechanisms and no recurrence
B) Increasing the number of layers
C) Relying heavily on convolutional layers
D) Removing the encoder-decoder structure

The self-attention mechanism computes attention scores for:
A) Every token in the input sequence with every other token
B) The first token in the sequence only
C) The output tokens only
D) The longest sequence in the batch

The architecture of Transformer-based models such as BERT is based on:
A) Recurrent Neural Networks
B) Convolutional Neural Networks
C) Self-attention layers and feed-forward networks
D) Long Short-Term Memory networks

Transformer-XL improves upon the original Transformer by:
A) Adding more layers to the network
B) Using a memory mechanism to capture longer-term dependencies
C) Increasing the number of attention heads
D) Reducing the size of the model

XLM is designed for:
A) Monolingual text classification
B) Multilingual text processing and translation
C) Image classification
D) Time-series forecasting

When training a spell checker using attention mechanisms, the main goal is to:
A) Classify text as correct or incorrect
B) Correct spelling errors in real-time text inputs
C) Predict the next word in a sequence
D) Translate text from one language to another

To improve a spell checker, one approach could be to:
A) Decrease the size of the training data
B) Introduce more language-specific rules
C) Train the model on noisy, real-world data
D) Replace the attention mechanism with a simple RNN

Transfer learning in NLP typically involves:
A) Training a model from scratch
B) Fine-tuning a pretrained model on a new, task-specific dataset
C) Using a model to translate text between languages
D) Applying a model for image recognition

BERT's pre-training involves:
A) Masked Language Modeling (MLM) and Next Sentence Prediction (NSP)
B) Predicting the next word in a sequence
C) Classifying entire documents
D) Sentence segmentation

ELMo differs from other models like BERT because:
A) It uses character-level embeddings
B) It is unidirectional
C) It only focuses on English text
D) It generates static word embeddings

When adapting BERT for sentiment analysis, the first step is to:
A) Replace BERT with an LSTM model
B) Tokenize the input text
C) Generate image features
D) Fine-tune BERT without any task-specific data

Which of the following models is a distilled version of BERT?
A) XLNet
B) DistilBERT
C) ALBERT
D) ROBERTa

The main limitation of vanilla Seq2Seq models is their inability to capture long-term dependencies, which is addressed by the _____ mechanism.
Answer: attention

The attention mechanism computes _____ scores that determine the relative importance of each input token.
Answer: weight

In the transformer model, _____ attention is responsible for allowing each token to attend to every other token in the sequence.
Answer: self

Transformer-XL extends the standard Transformer model by adding a _____ mechanism to handle longer sequences.
Answer: memory

BERT uses a technique called _____ Language Modeling (MLM), where random tokens in a sentence are replaced with a mask for the model to predict.
Answer: Masked

Large-scale models like _____ are designed for cross-lingual tasks, including translation and multilingual classification.
Answer: XLM

DistilBERT is a smaller, more efficient version of BERT that is trained using a method called _____ learning.
Answer: distillation

Transformer models rely heavily on _____ attention layers to model relationships between tokens in a sequence.
Answer: multi-head

A spell checker can be improved by training it on data that includes intentional _____ to simulate real-world errors.
Answer: noise

To make the spell checker more effective, the model needs to be able to handle various forms of _____ input, such as typos and misspellings.
Answer: noisy

Pretraining BERT involves two main tasks: Masked Language Modeling and _____ Sentence Prediction (NSP).
Answer: Next

In sentiment analysis with BERT, the first step is to tokenize the input using a _____ tokenizer.
Answer: WordPiece

_____ is a lightweight version of BERT that reduces the number of parameters while retaining performance.
Answer: ALBERT

XLNet differs from BERT by capturing _____ dependencies using a permutation-based approach.
Answer: bidirectional

BERT stands for _____ Encoder Representations from Transformers.
Answer: Bidirectional

_____ learning involves using a model trained on one task and applying it to another related task with minimal modifications.
Answer: Transfer