Quiz Questions on Generative AI

1. Which of the following is a fundamental concept in generative AI?

A) Supervised learning

B) Unsupervised learning

C) Reinforcement learning

D) All of the above

2. What is the primary function of a generative AI model?

A) Classifying data

B) Generating new data

C) Predicting outcomes

D) Filtering information

3. Before the advent of Transformers, which architecture was commonly used for text generation?

A) LSTM

B) CNN

C) GAN

D) RNN

4. What was a significant drawback of pre-Transformer architectures for text generation?

A) Limited memory capacity

B) Inability to learn long-range dependencies

C) Slow training speed

D) High computational cost

5. The Transformer architecture was introduced in which seminal paper?

A) "Deep Learning for Natural Language Processing" by Bengio et al.

B) "Attention is All You Need" by Vaswani et al.

C) "Generative Adversarial Networks" by Goodfellow et al.

D) "Neural Machine Translation by Jointly Learning to Align and Translate" by Bahdanauetal.

6. What key component in the Transformer architecture helps capture long-range dependencies in text?

A) Activation functions

B) Attention mechanism

C) Pooling layers

D) Convolutional layers

7. In the Transformer architecture, what is the purpose of the encoder?

A) Generating text

B) Decoding text

C) Extracting features from input text

D) Calculating loss function

8. Which of the following is not a step in the typical lifecycle of a generative AI project?

A) Data collection and preprocessing

B) Model training and evaluation

C) Deployment and monitoring

D) Model interpretation and explanation

9. What is the primary use case of generative AI models in natural language processing?

A) Image classification

B) Speech recognition

C) Text summarization

D) Sentiment analysis

10. Which phase of the generative AI project lifecycle involves fine-tuning the model based on performance metrics?

A) Data preprocessing

B) Model training

C) Model evaluation

D) Model deployment

11. Which of the following is a key feature of Transformer-based language models like GPT?

A) Attention mechanism

B) Recurrent layers

C) Gradient boosting

D) Convolutional filters

12. What distinguishes generative AI from other AI approaches?

A) It only generates text

B) It requires labelled data for training

C) It can create new data similar to the input data

D) It relies solely on reinforcement learning algorithms

13. Which of the following is a limitation of earlier text generation models compared to Transformers?

A) Inability to generate coherent text

B) Limited vocabulary size

C) Difficulty in handling long sequences

D) High computational cost

14. What role does the decoder play in the Transformer architecture?

A) Encoding input text

B) Generating output text

C) Extracting features from input text

D) Calculating attention weights

15. What is the primary advantage of using the Transformer architecture for text generation tasks?

A) Faster training speed

B) Improved ability to handle long-range dependencies

C) Lower memory requirements

D) Higher interpretability

16. Which of the following is an example of a generative AI application outside of natural language processing?

A) Image segmentation

B) Speech synthesis

C) Stock price prediction

D) Email spam detection

17. What is the purpose of the attention mechanism in the Transformer architecture?

A) To increase computational efficiency

B) To focus on relevant parts of the input sequence

C) To prevent overfitting

D) To apply regularisation

18. Which phase of a generative AI project involves selecting the appropriate evaluation metrics?

A) Data preprocessing

B) Model training

C) Model evaluation

D) Model deployment

19. What distinguishes a generative AI model from a discriminative AI model?

A) Generative models only produce discrete outputs

B) Discriminative models can generate new data

C) Generative models can generate new data similar to the training data

D) Discriminative models cannot be used for text generation

20. What is the primary objective of text generation with large language models like GPT?

A) Minimising training time

B) Maximising computational resources

C) Achieving human-level performance

D) Increasing model complexity

Here are the answers to the above questions with brief explanations:

1. D) All of the above - Generative AI can leverage supervised, unsupervised, and reinforcement learning techniques for training models to generate new data.

2. B) Generating new data - The primary function of generative AI models is to create new data, such as text, images, or audio, based on the patterns learned from the training data.

3. D) RNN - Before Transformers, Recurrent Neural Networks (RNNs) and their variants like LSTMs were commonly used for text generation tasks.

4. B) Inability to learn long-range dependencies - Pre-Transformer architectures like RNNs struggled to capture long-range dependencies in sequences due to the inherent limitations of their recurrent nature.

5. B) "Attention is All You Need" by Vaswani et al. - This seminal paper introduced the Transformer architecture, which revolutionized sequence-to-sequence tasks like machine translation and text generation.

6. B) Attention mechanism - The attention mechanism in Transformers allows the model to focus on relevant parts of the input sequence, enabling it to capture long-range dependencies more effectively.

7. C) Extracting features from input text - In the Transformer architecture, the encoder's role is to extract meaningful features from the input text sequence.

8. D) Model interpretation and explanation - The typical lifecycle of a generative AI project includes data preparation, model training and evaluation, and deployment, but not necessarily model interpretation and explanation.

9. C) Text summarization - One of the primary use cases of generative AI models in natural language processing is text summarization, where the model generates a concise summary of a longer text.

10. B) Model training - During the model training phase, generative AI models are fine-tuned based on performance metrics to improve their ability to generate high-quality data.

11. A) Attention mechanism - The attention mechanism is a key feature of Transformer-based language models like GPT, allowing them to capture long-range dependencies and generate coherent text.

12. C) It can create new data similar to the input data - Generative AI models are distinguished by their ability to generate new data that resembles the input data used for training.

13. C) Difficulty in handling long sequences - Earlier text generation models like RNNs faced challenges in handling long sequences due to the vanishing gradient problem and limited memory capacity.

14. B) Generating output text - In the Transformer architecture, the decoder's role is to generate the output text sequence based on the features extracted by the encoder.

15. B) Improved ability to handle long-range dependencies - The Transformer architecture's attention mechanism allows it to effectively capture long-range dependencies in sequences, leading to improved text generation performance.

16. B) Speech synthesis - While generative AI has widespread applications in natural language processing, it can also be used for tasks like speech synthesis, generating synthetic speech from text.

17. B) To focus on relevant parts of the input sequence - The attention mechanism in Transformers allows the model to selectively focus on the most relevant parts of the input sequence when generating output.

18. C) Model evaluation - Selecting appropriate evaluation metrics, such as perplexity or BLEU scores, is an important step during the model evaluation phase of a generative AI project.

19. C) Generative models can generate new data similar to the training data - Generative AI models are designed to generate new data that resembles the training data, while discriminative models are used for tasks like classification or prediction.

20. C) Achieving human-level performance - The primary objective of text generation with large language models like GPT is to achieve human-level performance in generating coherent, natural-sounding text.