



INDIAN SCHOOL AL WADI AL KABIR

Class: IX	Department: Computer Science
WORKSHEET	ARTIFICIAL INTELLIGENCE (417) Part B Unit 4 Generative AI

Objective Type Questions

1. 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
2. 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
3. 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
4. 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
5. What is 'Text-to-Image' generation in the context of Generative AI?
 - a) Translating text data into images
 - b) Creating images from textual descriptions using AI algorithms**
 - c) Converting image files into text files
 - d) Storing text as images
6. 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
7. What is a 'Recurrent Neural Network' (RNN)?
 - a) A network for recurrent data processing
 - b) A type of AI used for generating sequences
 - c) Neural networks that excel at handling sequential data, like music or text.**
 - d) A network for storing sequential data
8. 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
9. Choose the odd one out
 - a) FineShare
 - b) Boomy AI
 - c) Piggy AI**
 - d) Playlist AI

10. What is 'Unsupervised Learning' in the context of AI?
- a) **Learning from a dataset without predefined labels**
 - b) Learning with strict supervision
 - c) A method for supervised data classification
 - d) A network management technique

Subjective Type questions

11. Explain Supervised Learning

Supervised learning is a type of machine learning where the computer is taught using examples that include both input and output.

Training phase: Train the machine learning 1 Model using the labelled dataset.

The model looks at the features of the data and learns to associate these features with the corresponding data type.

Testing Phase: Once the model is trained, test it with unlabelled data. The model uses the already learned information to predict the output, demonstrating how well it has learned the patterns in the data

12. Explain Unsupervised learning

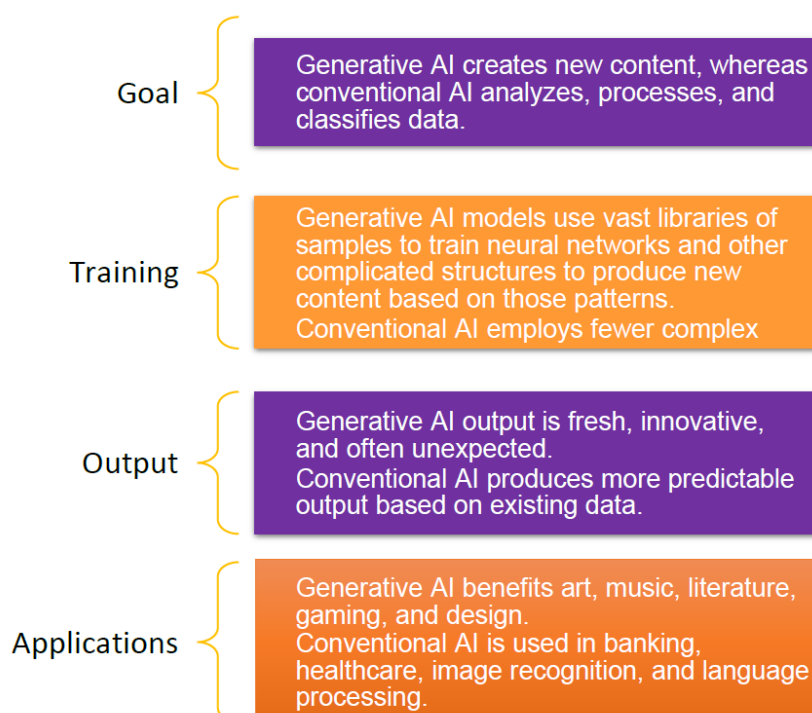
Un supervised learning is a type of machine learning where the computer is given data without any labels or answers. It has to figure out the patterns and relationships in the data all by itself.

- Input (Raw data):
- Data: Machine does not know the data.
- Process: The algorithm processes these images and tries to group them based on physical similarities it detects

Output: The algorithm organizes the images into clusters. Each cluster is expected to contain images of similar objects.

In unsupervised or self-supervised learning, the machine learning model takes unlabeled datasets and figures out patterns and inherent structures within them, without human intervention.

13. Compare generative AI with Conventional AI



14. Explain the types of Generative AI

4 Marks

1. GANs (Generative Adversarial Networks): GANs are neural networks that collaborate to produce fresh data

- Made up of two neural networks: Generator Network & Discriminator Network
- The generator network produces the data, while the discriminator network analyses the data and provides feedback.
- Until the generator can generate data that is identical to real data, the two networks collaborate in a feedback loop.
- Examples-creating portraits of non-existing people, convert images from day to night, generate images based on textual description, generate realistic video, 3D object creation, improve video and image quality etc.

2.Auto Encoder: These are Neural networks that have been trained to learn a compressed representation of data

- They function by compressing data first, then decompressing that compressed data to restore it to its original form.
- Auto encoders can be applied to denoising or picture compression applications.
- Examples- artistic image creation, drug discovery. They generate highly realistic samples.

3. VAEs. (Variational Autoencoder): In order to produce fresh data, VAEs learn the distribution of the data and then sample from it.

Examples- Generation of new images similar to given training set, Image reconstruction, generating drafts for writer, generating new sounds and music composition etc.

4. RNNs (Recurrent Neural Network): are a special class of neural networks that excel at handling sequential data, like music or text. They function by feeding past inputs and applying that knowledge to anticipate future inputs.

Example- Generating novel text in the style of a specific author or genre, predicting next character or word in a sequence, sentiment analysis etc.

15. Describe any four benefits of Generative AI

4Marks

Creativity: Generative AI can assist creatives in pushing the boundaries in making creative processes more efficient and personalized. This can be particularly valuable in fields such as art, design, and music.

Efficiency: Generative AI can automate content creation processes, which can save time and reduce costs compared to traditional manual processes.

Personalization: Generative AI can be used to create personalized content for individual users based on their preferences and behaviors, such as customized product recommendations or personalized news articles.

Exploration: Generative AI can be used to explore new design spaces or optimize complex systems, such as designing new drugs or improving industrial processes.

Accessibility: Generative AI can democratize access to content creation tools, making it easier for people with limited resources or technical expertise to produce high-quality content.

Scalability: Generative AI can be used to generate large volumes of content quickly and efficiently, making it a scalable solution for businesses and organizations that need to produce large amounts of content.

(Write any four)

16. Describe any two Limitations of Generative AI

2 Marks

1. **Data Bias:** If generative AI is trained on biased or incomplete data, the output may be similarly biased or flawed. This can lead to inaccurate or problematic results in certain applications, such as in facial recognition or natural language processing.
2. **Uncertainty:** Generative AI can produce unexpected and often unpredictable results, which can be both a benefit and a drawback.
3. **Computational Demands:** Generative AI requires significant computational resources to train and generate its output, which can be expensive and time-consuming

(Write any two)

17. Explain Ethical considerations of using Generative AI

4 marks

Ownership { There are questions about who owns the content generated by generative AI. This is particularly relevant in creative fields such as music, literature, or art, where generative AI can create original works that blur the lines between human and machine authorship.

Human Agency { Generative AI raises questions about human agency and control. As technology becomes more sophisticated, it may become increasingly difficult to distinguish between content generated by humans and machines, which could lead to a loss of human autonomy and agency.

Bias { Generative AI can replicate and amplify existing biases present in the data used to train the model. This can lead to harmful or discriminatory outcomes, especially if the generated content is used in high-stakes applications such as hiring, loan approvals, or criminal justice.

Misinformation { Generative AI can be used to create fake news or deepfakes, which can be used to spread misinformation and manipulate public opinion. This can have serious consequences for democracy and trust in institutions.

Privacy { Generative AI can potentially be used to generate sensitive personal information, such as credit card numbers, social security numbers, or medical records. This could be used for malicious purposes.