

Name: _____ Date: _____

Sizzling Silicon: Senior Synthetic Intelligence Seminar Quiz

Moving beyond automated routines, these logic puzzles challenge students to analyze algorithmic bias and the architecture of recurrent neural networks.

1. In the context of architectural design for sequence processing, which mechanism allows a Transformer model to weigh the importance of different parts of the input data regardless of their distance?

- A. Backpropagation through time (BPTT)
- B. Self-Attention Mechanism
- C. Max-pooling layers
- D. Stochastic gradient descent

2. When an AI model performs exceptionally well on training data but fails to generalize to unseen test data, it is experiencing _____.

- A. Underfitting
- B. Hyperparameter tuning
- C. The Black Box problem
- D. Overfitting

3. True or False: In Reinforcement Learning, the 'agent' learns through a system of rewards and penalties without requiring a labeled dataset of correct input-output pairs.

- A. True
- B. False

4. Which of the following best describes 'Algorithmic Bias' in the deployment of predictive policing or recidivism software?

- A. A hardware limitation caused by insufficient GPU processing power.
- B. The unintentional reflection of historical societal prejudices present in the training data.
- C. A security vulnerability that allows hackers to bypass the AI's logic.
- D. The loss of data integrity during the compression of large neural networks.

5. The process of using a pre-trained model on a new, related task to save computational resources and time is known as _____ Learning.

- A. Transfer
- B. Unsupervised
- C. Generative
- D. Hebbian

6. True or False: A Convolutional Neural Network (CNN) is primarily designed to process sequential data like audio or text through its recursive feedback loops.

- A. True

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B. False

7. What is the primary function of the 'Discriminator' in a Generative Adversarial Network (GAN)?

- A. To create new, synthetic data samples from random noise.
- B. To calculate the gradient descent for the entire network.
- C. To distinguish between real data and data produced by the Generator.
- D. To act as the user interface for the AI output.

8. In the context of AI Ethics, the ability to trace an AI's decision-making process in a way that humans can understand is called _____.

- A. Singularity
- B. Latent Space
- C. Explainability
- D. Turing Stability

9. True or False: Artificial General Intelligence (AGI)—the ability for a machine to perform any intellectual task a human can—is currently the standard technology used in modern smart assistants.

- A. True
- B. False

10. Consider an AI used for autonomous drone flight. If the system uses 'Computer Vision' to map its surroundings, what is the role of the 'Activation Function' in its neural network nodes?

- A. To store the large-scale image database.
- B. To determine whether a neuron should be 'fired' based on the input signal.
- C. To physically move the drone's rotors.
- D. To encrypt the communication between the drone and the controller.