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# Round 1: General

## **Introduction:**

Artificial Intelligence is a field of computer science focused on creating intelligent machines that can simulate human cognitive abilities through various techniques like machine learning, neural networks, and natural language processing to solve complex problems and make decisions across diverse applications.

## **Question 1:**

What is the main goal of Artificial Intelligence?

1. To make computers think
2. To store large amounts of data
3. To make computers run faster
4. To connect devices to the internet

## **Question 1 Hint:**

Look for the option that talks about copying human abilities. Regular computers can store, run, and connect - but only one option focuses on making computers act like human brains. Which one describes this human-like behavior?

## **Question 2:**

Which of the following is the branch of Artificial Intelligence?

1. Machine learning
2. Cyber Forensics
3. Full Stack Development
4. Network Design

## **Question 2 Hint:**

Think carefully about which technology is designed to mimic human intelligence. Three of these options focus on building or analyzing fixed systems, while one specializes in creating programs that can actually learn over time. Which one has this unique 'learning' ability?

**Question 3:**

Who is considered the Father of Artificial Intelligence?

1. John McCarthy
2. Geoffrey Hinton
3. Andrew Ng
4. Alan Turing

**Question 3 Hint:**

While Geoffrey Hinton revolutionized deep learning, Andrew Ng pioneered modern machine learning, and Alan Turing conceptualized computing intelligence, only John McCarthy actually established the field and name of 'Artificial Intelligence' at a historic 1956 conference and is considered the father of AI.

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## Round 2: Supervised vs Unsupervised

**Introduction:**

In supervised learning, the machine learns like a student with a teacher. It learns with examples that are already marked with labeled data as correct answers. In unsupervised learning, the machine works more like an explorer. It looks at data without any labels and tries to find patterns on its own without being told what groups to make.

**Question 1:**

Which type of machine learning would be most appropriate for automatically identifying dogs and cats in photos?

1. Supervised learning
2. Unsupervised learning
3. Reinforcement learning
4. Semi-supervised learning

**Question 1 Hint:**

Think about which type of machine learning for recognizing objects in pictures.

**Question 2:**

Which of these situations involves supervised learning?

1. Grouping customers based on their purchase history without knowing customer types in advance
2. Training a model to recognize handwritten numbers by providing examples of each number
3. Allowing a robot to learn the fastest way through a maze by trial and error
4. Clustering data points without providing any labels

**Question 2 Hint:**

Think about how a computer learns.

**Question 3:**

Which of these situations uses unsupervised learning?

1. Grouping online shoppers into different customer types based on their browsing history without predefined categories
2. Teaching a computer to detect spam emails using examples of spam and non-spam messages
3. Training an AI to classify medical images using a database of diagnosed patient scans
4. Predicting house prices using data from past sales with known prices

**Question 3 Hint:**

Think about patterns.

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# Round 3: Reinforcement learning

## Introduction:

Imagine teaching a dog new tricks. When the dog does something right, you give it a reward; when it makes a mistake, you don't reward it. Over time, the dog learns which actions lead to treats and repeats those behaviors. This is exactly how reinforcement learning works! In reinforcement learning, an AI agent learns by interacting with an environment, just like the dog. When it takes an action, it gets feedback in the form of rewards or penalties.

## Question 1:

Which scenario best represents the reward mechanism in a Reinforcement Learning system?

1. A drone learning to maintain stability in varying wind conditions by receiving altitude and orientation feedback signals
2. A factory robot learning assembly patterns from a database of correct assemblies
3. A trading algorithm using historical price patterns to identify market trends
4. A quality control system detecting defects based on images of good and bad products

## Question 1 Hint:

Think about dynamic responses.

## Question 2:

What is the difference between an agent and its environment in Reinforcement Learning?

1. The agent takes actions, and the environment provides feedback based on these actions.
2. The agent collects labeled data while the environment provides unlabeled data
3. The agent stores data while the environment processes it
4. The environment learns from the agent's actions, not the other way around.

## Question 2 Hint:

Think about interaction."

**Question 3:**

A smart traffic system uses Reinforcement Learning to control traffic lights in a city. Which description best matches how it actually works?

1. The traffic light controller looks at how many cars are waiting and how long they've been waiting. It tries different signal timing patterns and learns from seeing how these changes affect the average waiting time.
2. The cameras watch traffic and predict busy periods based on past data. They get rewarded for guessing rush hours correctly.
3. The system records how long lights stay green and stores traffic data. It aims to save storage space efficiently.
4. The analyzer looks at different types of vehicles and groups similar traffic patterns together.

**Question 3 Hint:**

Think about who's in control.