1. Define Artificial Intelligence (AI) and provide examples of its applications.

cA: Artificial Intelligence (AI) is the simulation of human intelligence processes by machines, especially computer systems. Examples include virtual assistants like Siri, recommendation systems like those used by Netflix, and autonomous vehicles.

2. Differentiate between supervised and unsupervised learning techniques in ML.

A: Supervised learning involves training a model on labeled data, where each input is associated with a corresponding output. Unsupervised learning involves training a model on unlabeled data, where the model learns patterns and structures without explicit guidance.

3. What is Python? Discuss its main features and advantages.

A: Python is a high-level, interpreted programming language known for its simplicity and readability. Its main features include dynamic typing, automatic memory management, and a vast ecosystem of libraries. Advantages include its versatility, ease of learning, and extensive community support.

4. What are the advantages of using Python as a programming language for AI and ML?

A: Python's advantages for AI and ML include its simplicity, readability, and extensive libraries such as TensorFlow and scikit-learn, which provide tools for various AI and ML tasks. Its flexibility and compatibility with other languages and platforms also make it suitable for prototyping and production.

5. Discuss the importance of indentation in Python code.

An: Indentation in Python is crucial for defining the structure and scope of code blocks. It determines which statements belong to which block of code, such as loops, functions, or conditional statements.

6. Define a variable in Python. Provide examples of valid variable names.

A: In Python, a variable is a symbolic name that represents a value stored in memory. Valid variable names can consist of letters, numbers, and underscores but must start with a letter or underscore. Examples: x = 55, my_variable = "Hello world".

7. Explain the difference between a keyword and an identifier in Python.

A: A keyword is a reserved word that has a special meaning in the Python language and cannot be used as a variable name. An identifier is a name given to entities like variables, functions, etc., which the programmer defines. Keywords are predefined and cannot be changed, while identifiers are user-defined.

8. List the basic data types available in Python.

A: Basic data types in Python include integers, floating-point numbers, strings, booleans, lists, tuples, dictionaries, and sets.

9. Describe the syntax for an if statement in Python.

A: The syntax for an if statement in Python is:

If condition:

code block to execute if condition is true

If: This keyword starts the if statement.

Condition: This is an expression that evaluates to either True or False. If the condition is True, the code block following the if statement is executed.

A colon (:) marks the end of the if statement's condition and the beginning of the indented code block.

Indented code block: This block contains the code that is executed if the condition is true. It can consist of one or more statements. The indentation level determines which statements are part of this block.

10. Explain the purpose of the elseif statement in Python.

A: The elseif statement in Python is used to check additional conditions after the initial if statement. It allows for the evaluation of multiple conditions sequentially. If the condition in the if statement is false, Python evaluates the condition in the elseif statement.