Quiz Simulation Test (Python & Machine Learning)

Question 1

Which of the following is the correct way to add matplotlib library to your application?

- A. `import matplotlib as plt`
- B. `import matplotlib.pyplot as plt`
- C. `import matplotlib.plt`
- D. `from matplotlib import pyplot as plt`

Correct Answer

B,D

Explanation

Exam Focus

- Matplotlib basic import
- Library usage convention
- **Memory-based question**

Question 2

How do you save a Pandas DataFrame to a CSV file?

- A. `df.write_csv("file.csv")`
- B. `df.save_csv("file.csv")`
- C. `df.export_csv("file.csv")`
- D. `df.to_csv("file.csv")`

Correct Answer

D

Explanation

Pandas uses the `to_xxx()` naming convention for exporting data, such as `to_csv()`, `to_excel()`.

Exam Focus

- Pandas I/O functions
- API naming rules

Question 3

What is the output of the following code?

```
arr = np.array([1, 2, 3, 4, 5, 6])
new_arr = arr.reshape(2, 3)
print(new_arr)
```

☑ Correct Answer

```
[[1 2 3]
 [4 5 6]]
```

🕮 Explanation

The array has 6 elements and is reshaped into 2 rows and 3 columns using row-major order.

🎯 Exam Focus

- NumPy `reshape()`
- Array dimensions
- **Understanding-based question**

Question 4

Which of the following application can use RNN for prediction?

- A. Image recognition
- B. Time Series prediction
- C. Text summarization
- D. Object detection

☑ Correct Answer

B *(If multiple answers allowed: B and C)*

🕮 Explanation

RNNs are designed for sequential data, making them ideal for time series and text-based tasks.

🎯 Exam Focus

- RNN application scenarios
- Conceptual understanding

Question 5

Which of the following data structure is used during the ML training?

- A. ndarray
- B. tensor
- C. dataframe
- D. list

☑ Correct Answer

B

📖 Explanation

Deep learning frameworks such as TensorFlow and PyTorch use **tensors** as the core data structure during training.

🎯 Exam Focus

- ML vs DL data structures
- Framework fundamentals

Question 6

The (_____) method in PyTorch defines how the data flows through the model.

☑ Correct Answer

`forward`

📖 Explanation

The `forward()` method defines the forward propagation logic of a PyTorch model.

🎯 Exam Focus

- PyTorch model structure
- Core API knowledge

Question 7

Which of the following functions can be used to optimize the parameters in TensorFlow?

- A. Mean Square Error
- B. SGD
- C. Adam
- D. Mean Absolute Error

☑ Correct Answer

B and C *(If single choice: C – Adam)*

📖 Explanation

SGD and Adam are optimizers, while MSE and MAE are loss functions.

Exam Focus

- Optimizer vs Loss function
- Deep learning fundamentals

Question 8

What is the main purpose of Keras?

- A. To replace TensorFlow as a backend engine
- B. To simplify the building and training of model for TensorFlow
- C. To create low-level ML algorithms
- D. All of the above

Correct Answer

B

Explanation

Keras is a high-level API built on TensorFlow to simplify model construction and training.

Exam Focus

- Keras framework positioning
- High-level vs low-level APIs

Question 9

What is the purpose of an activation function in neural networks?

- A. To optimize model performance
- B. To reduce model complexity
- C. To add non-linearity to the model
- D. To increase training speed

Correct Answer

C

Explanation

Activation functions introduce non-linearity, enabling neural networks to learn complex patterns.

Exam Focus

- Neural network theory
- Core conceptual question

Question 10

Which of the following is most suitable to be used with CNN?

- A. Speech recognition
- B. Financial forecasting
- C. Image recognition
- D. Natural Language Processing

☑ Correct Answer

C

🕮 Explanation

CNNs excel at spatial data processing, making them ideal for image recognition tasks.

🎯 Exam Focus

- CNN application scenarios
- Model selection

Question 11

How many trainable parameters are there in a Dense network?

- Input = 10 nodes
- Output = 5 nodes
- A. 10
- B. 15
- C. 50
- D. 55

☑ Correct Answer

D

🕮 Explanation

- Weights = 10 × 5 = 50
- Biases = 5
- Total = 55 parameters

🎯 Exam Focus

- Dense layer parameter calculation

- **High-frequency calculation question**

Question 12

What is the purpose of the `__init__` method in a Python class?

- A. To access the attributes of an instance
- B. To create a new instance of a class
- C. To initialize the attributes for a new instance
- D. To define a new method

☑ Correct Answer

C

🎯 Exam Focus

- Python OOP
- Constructor behavior

Question 13

A (_____) in Python is a blueprint for creating objects.

☑ Correct Answer

Class

🎯 Exam Focus

- Object-Oriented Programming basics
- Definition recall

Question 14

What does the dunder method `__str__` perform?

☑ Correct Answer

Defines the **string representation of an object**, used when calling `print()`.

🎯 Exam Focus

- Python magic (dunder) methods
- Object representation

Question 15

What does `super()` refer to in the following code?

```
class Square(Rectangle):
    def __init__(self, length):
        super().__init__(length, length)
```

☑ Correct Answer

Refers to the **parent class (`Rectangle`)**.

🕮 Explanation

`super()` is used to call methods from the parent class, typically the constructor.

🎯 Exam Focus

- Inheritance
- Parent class initialization

📌 Overall Exam Focus Summary

Topic	Frequency
NumPy reshape / arrays	★★★★
Pandas I/O	★★★
CNN / RNN concepts	★★★★
Tensor / Optimizer	★★★★★
Dense parameters	★★★★★
Python OOP	★★★★

☑ 问题 1

Which of the following is the correct way to add matplotlib library to your application?

正确答案： 👉 **B,D.** `import matplotlib.pyplot as plt` `from matplotlib import pyplot as plt`

解析

- `matplotlib.pyplot` 是 Matplotlib 中用于**绘图的子模块**
- 约定俗成使用 `plt` 作为别名

❌ A: `import matplotlib as plt`

- `matplotlib` 是整个包，不是绘图接口

❌ C: `import matplotlib.plt`

- 不存在这个模块

❌ D: `from matplotlib import pyplot as plt`

- **其实是正确的，但考试一般只认标准写法 B**

考点分析

- **Matplotlib 基本导入方式**
- **记忆型考点（送分题）**

☑ 问题 2

How do you save a Pandas DataFrame to a CSV file?

正确答案： 👉 **D.** `df.to_csv("file.csv")`

解析

- Pandas 中所有导出函数统一以 `to_xxx()` 命名
    - `to_csv`
    - `to_excel`
    - `to_json`

考点分析

- **Pandas I/O 接口**
- **API 命名规范（高频）**

☑ 问题 3

Output of reshape

```
arr = np.array([1,2,3,4,5,6])
new_arr = arr.reshape(2,3)
print(new_arr)
```

正确答案：

```
[[1 2 3]
 [4 5 6]]
```

解析

- 原数组长度 = 6
- reshape(2,3) → 2 行 3 列
- 按 **行优先（row-major）** 填充

考点分析

- **NumPy reshape**
- **数组维度理解（偏理解）**

☑ 问题 4

Which application can use RNN for prediction?

正确答案： 👉 **B. Time Series prediction** 👉 **C. Text summarization（如果允许多选）**

⚠ 如果是**单选题**，标准答案是 **B**

解析

- RNN 擅长处理 **序列数据**
- 时间序列 = 最典型应用

考点分析

- **RNN 应用场景**
- **概念理解题**

☑ 问题 5

Which data structure is used during ML training?

正确答案： 👉 **B. tensor**

解析

- 在 **PyTorch / TensorFlow** 中，训练的基本数据结构是 **Tensor**
- ndarray / dataframe 常用于数据预处理阶段

考点分析

- **深度学习框架基础概念**
- **区分"数据准备 vs 训练"**

☑ 问题 6

The (____) method in PyTorch defines how data flows through the model

正确答案： 👉 `forward`

解析

- 在 PyTorch 中：

```
def forward(self, x):
    ...
```

- 定义前向传播逻辑

🎯 考点分析

- **PyTorch 模型结构**
- **必背 API（极高频）**

☑ 问题 7

Which functions optimize parameters in TensorFlow?

正确答案： 👉 **B. SGD** 👉 **C. Adam**

⚠ 如果单选 → **Adam（更常见）**

解析

- SGD / Adam = **优化器**
- MSE / MAE = **损失函数**

🎯 考点分析

- **Optimizer vs Loss function 区分**
- **DL 基础概念（高频）**

☑ 问题 8

Main purpose of Keras

正确答案： 👉 **B. To simplify the building and training of model for TensorFlow**

解析

- Keras 是 **高层 API**
- 封装复杂 TensorFlow 操作

❌ A：不是替代 TensorFlow ❌ C：不是低层算法 ❌ D：错误（B 才是唯一正确）

🎯 考点分析

- **Keras 定位**
- **框架层级理解**

☑ 问题 9

Purpose of activation function

正确答案： 👉 **C. To add non-linearity to the model**

解析

- 没有激活函数 → 网络等价于线性模型
- ReLU / Sigmoid / Tanh 都是非线性

🎯 考点分析

- **神经网络核心原理**
- **必背理论题**

☑ 问题 10

Most suitable for CNN

正确答案： 👉 **C. Image recognition**

解析

- CNN = 卷积神经网络
- 擅长处理 **空间结构数据（图片）**

🎯 考点分析

- **CNN 应用场景**
- **经典送分题**

☑ 问题 11

Trainable parameters in Dense layer

Input = 10 Output = 5

正确答案： 👉 **D. 55**

计算过程

- 权重：10 × 5 = 50
- 偏置：5
- 总参数 = 50 + 5 = **55**

🎯 考点分析

- **Dense 层参数计算**

- **必考计算题**

☑ 问题 12

Purpose of `__init__` method

正确答案： 👉 **C. To initialize the method for a new instance**

解析

- `__init__` 在对象创建后自动执行
- 用于初始化属性

🎯 考点分析

- **Python OOP 基础**
- **构造函数概念**

☑ 问题 13

A (____) in Python is a blueprint for creating objects

正确答案： 👉 **Class**

🎯 考点分析

- **面向对象基础定义**
- **概念记忆题**

☑ 问题 14

What does `__str__` do?

正确答案： 👉 **Defines the string representation of an object**

示例

```
print(obj)
```

→ 调用 `__str__`

🎯 考点分析

- **Dunder methods**
- **对象字符串表示**

☑ 问题 15

What does `super()` refer to?

```
class Square(Rectangle):
    def __init__(self, length):
        super().__init__(length, length)
```

正确答案： 👉 **Refers to the parent class (`Rectangle`)**

解析

- `super()` 用于调用父类的方法
- 这里调用的是 `Rectangle.__init__`

🎯 考点分析

- **继承**
- **父类构造函数调用**

🔥 全套考点总结（极重要）

模块	高频程度
NumPy reshape / axis	★★★★
Pandas I/O	★★★
CNN / RNN 应用	★★★★
Tensor / Optimizer	★★★★★
Dense 参数计算	★★★★★
Python OOP	★★★★

如果你愿意，下一步我可以：

- 🔥 把这套题**改写成你考试同款的选择题模拟卷**
- 🤔 针对 **Dense 参数 / Optimizer / Broadcasting** 出易错题
- 📄 做一页 **考试前 1 小时速记表**

你想直接冲哪一个？