



Computer Science Engineer:

Total points 15/36 ?

Time Duration: 30 Min

The respondent's email (cs21b042@iittp.ac.in) was recorded on submission of this form.

0 of 3 points

✗ Name *

.../1

REDDY SAI KRISHNA

✗

✗ Roll Number *

.../1

CS21B042

✗

✗ College Name *

.../1

IIT Tirupati

✗

Wishing You All The Best

15 of 33 points



✓ **1: Which metaclass feature allows for runtime class injection in Python frameworks like Django?** 1/1

- ☒ (A) `__new__()` method in a metaclass ✓
- ☐ (B) Singleton metaclasses with `__call__()`
- ☐ (C) Class decorators over metaclasses
- ☐ (D) Use of `ABCMeta` from the `abc` module

✗ **Name *** .../1

Reddy Sai Krishna ✗

✗ **Roll Number *** .../1

CS21B042 ✗

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✓ **2: What is the primary use case of the weakref module in Python?**

1/1

☒ (A) Prevent circular references in garbage collection ✓

☐ (B) Increase the speed of reference counting

☐ (C) Enable automatic thread cleanup

☐ (D) Implement singleton objects efficiently

✗ **3: How would you debug a deadlock in an asyncio event loop caused by improper usage of await inside nested coroutines?** 0/1

☐ (A) Enable debug mode in the event loop

☐ (B) Switch to synchronous blocking functions

☒ (C) Use asyncio.gather() with proper exception handling ✗

☐ (D) Call asyncio.run() inside every coroutine

Correct answer

☒ (A) Enable debug mode in the event loop



✗ **4: Which of the following techniques improves memory usage when dealing with large NumPy arrays?**

0/1

- ☐ (A) Using memory-mapped files via `numpy.memmap()`
- ☐ (B) Storing arrays as lists before processing
- ☒ (C) Serializing arrays using pickle
- ☐ (D) Reducing precision by converting to strings

✗

Correct answer

- ☒ (A) Using memory-mapped files via `numpy.memmap()`

✓ **5: Why is backdoor adjustment crucial in causal inference models?**

1/1

- ☐ (A) It removes biases from the target variable
- ☒ (B) It controls for confounding variables
- ☐ (C) It adjusts hyperparameters automatically
- ☐ (D) It optimizes convergence speed in gradient descent

✓

✓ **6: Which of the following techniques is most effective for forecasting non-stationary time series?**

1/1

- ☐ (A) Fourier transforms
- ☐ (B) Seasonal decomposition (STL)
- ☒ (C) Differencing combined with ARIMA models
- ☐ (D) Reinforcement learning-based models

✓



✗ **7: Which method is most effective at identifying adversarial inputs in neural networks?**

0/1

☒ (A) Using gradient-based activation maximization ✗

☐ (B) Measuring input feature entropy

☐ (C) Training with dropout layers during inference

☐ (D) Applying defense distillation on the outputs

Correct answer

☒ (D) Applying defense distillation on the outputs

✓ **8: What problem does Layer-Wise Relevance Propagation solve?**

1/1

☒ (A) Explaining model predictions at the feature level ✓

☐ (B) Accelerating backpropagation

☐ (C) Identifying overfitting layers in the network

☐ (D) Balancing weights during training



✗ **9: What is the most challenging aspect of continuous training in MLOps pipelines?** 0/1

- ☐ (A) Monitoring training latency
- ☐ (B) Handling concept drift without retraining
- ☒ (C) Automating hyperparameter optimization ✗
- ☐ (D) Reducing data leakage in production environments

Correct answer

- ☒ (B) Handling concept drift without retraining

✓ **10: What is the biggest challenge in implementing the BB84 quantum key distribution protocol over long distances?** 1/1

- ☒ (A) Managing entanglement loss in noisy quantum channels ✓
- ☐ (B) Detecting man-in-the-middle attacks
- ☐ (C) Preventing key exchange failures at the classical handshake step
- ☐ (D) Increasing the bit rate beyond classical limits

✓ **11: Python – Data Streaming with Kafka** 1/1
Which library is used to consume and process streaming data from Kafka in Python?

- ☐ ⓐ PyKafka
- ☐ ⓑ Confluent Python
- ☒ ⓒ Kafka-python ✓
- ☐ ⓓ Pandas



✓ **12: What is the primary role of CI/CD pipelines in automation?**

1/1

- ☐ Ⓐ) Automate model training in machine learning projects
- ☐ Ⓑ) Manage software dependencies across environments
- ☒ Ⓒ) Automate testing, building, and deployment processes ✓
- ☐ Ⓓ) Ensure that microservices remain consistent across servers

✗ **13: Which Python module can be used to detect memory leaks and cyclic references?** 0/1

- ☐ Ⓐ) gc
- ☒ Ⓑ) psutil ✗
- ☐ Ⓒ) memory_profiler
- ☐ Ⓓ) objgraph

Correct answer

- ☒ Ⓐ) gc

✗ **14: How do you create a decorator with arguments in Python?**

0/1

- ☒ Ⓐ) Nest a decorator function inside another function ✗
- ☐ Ⓑ) Use `functools.wraps()` on the outer function
- ☐ Ⓒ) Return a closure that accepts both arguments and the decorated function
- ☐ Ⓓ) Use `@staticmethod` on the decorated function

Correct answer

- ☒ Ⓒ) Return a closure that accepts both arguments and the decorated function



✓ **15: What is a common solution to handle data skew in distributed data pipelines?** 1/1

- ☐ Ⓐ) Broadcasting smaller datasets
- ☒ Ⓑ) Partitioning based on skewed keys ✓
- ☐ Ⓒ) Increasing the number of reducers
- ☐ Ⓓ) Applying lazy evaluation during transformations

✗ **16: What is the primary challenge in achieving cross-chain interoperability between blockchain networks?** 0/1

- ☒ Ⓐ) Synchronizing consensus mechanisms ✗
- ☐ Ⓑ) Preventing Sybil attacks
- ☐ Ⓒ) Establishing trust without third parties
- ☐ Ⓓ) Minimizing gas fees

Correct answer

- ☒ Ⓒ) Establishing trust without third parties



✗ **17: Which of the following is the primary use of Azure Functions in Python-based cloud automation?**

0/1

- ☐ Ⓐ Real-time data processing in IoT applications
- ☐ Ⓑ Training deep learning models at scale
- ☒ Ⓒ Automating Kubernetes deployments ✗
- ☐ Ⓓ Managing infrastructure-as-code

Correct answer

- ☒ Ⓐ Real-time data processing in IoT applications

✓ **18: Why might you use multiprocessing instead of threading in Python?**

1/1

- ☐ Ⓐ Multiprocessing allows sharing memory across threads
- ☒ Ⓑ Multiprocessing avoids the Global Interpreter Lock (GIL) ✓
- ☐ Ⓒ Threading is more efficient for CPU-bound tasks
- ☐ Ⓓ Threading provides better scalability across CPUs

✗ **19: Which of the following is a major challenge in AutoML pipelines?**

0/1

- ☒ Ⓐ Hyperparameter tuning ✗
- ☐ Ⓑ Automating data cleaning processes
- ☐ Ⓒ Model interpretability and fairness
- ☐ Ⓓ GPU optimization

Correct answer

- ☒ Ⓒ Model interpretability and fairness



✗ 20: Which of the following is an example of post-hoc explainability?

0/1

☒ A) Interpretable models ✗

☐ B) Feature attribution methods like SHAP

☐ C) Neural architecture search

☐ D) Hyperparameter tuning

Correct answer

☒ B) Feature attribution methods like SHAP

✓ 21: What is the main advantage of using Horovod over standard TensorFlow for distributed training?

1/1

☒ A) Horovod improves gradient aggregation efficiency with Ring-AllReduce ✓

☐ B) It eliminates the need for gradient synchronization

☐ C) It uses CPU-based training pipelines instead of GPU

☐ D) It replaces TensorFlow's Adam optimizer for faster convergence



✗ **22: How would you integrate Selenium with an asyncio event loop for concurrent browser automation?**

0/1

- ☐ Ⓐ) Use ``async with`` to manage Selenium drivers
- ☐ Ⓑ) Wrap blocking Selenium calls using ``run_in_executor()``
- ☒ Ⓒ) Run Selenium scripts inside Celery tasks ✗
- ☐ Ⓓ) Use the ``ThreadPoolExecutor`` from ``asyncio``

Correct answer

- ☒ Ⓑ) Wrap blocking Selenium calls using ``run_in_executor()``

✓ **23: Which robust training method is most effective against adversarial attacks on GANs?**

1/1

- ☐ Ⓐ) Wasserstein loss with gradient penalty
- ☐ Ⓑ) Batch normalization between every layer
- ☐ Ⓒ) Generating adversarial examples using FGSM
- ☒ Ⓓ) Using spectral normalization for the discriminator ✓



✗ **24: Why are StatefulSets preferred over Deployments in Kubernetes for certain applications?** 0/1

- ☒ ⓐ) They manage ephemeral services efficiently ✗
- ☐ ⓑ) They guarantee consistent network identities
- ☐ ⓒ) They ensure better load balancing across pods
- ☐ ⓓ) They automatically rescale during failures

Correct answer

- ☒ ⓑ) They guarantee consistent network identities

✗ **25: Which method is best suited for handling highly imbalanced datasets?** 0/1

- ☒ ⓐ) Stratified sampling ✗
- ☐ ⓑ) Synthetic Minority Oversampling (SMOTE)
- ☐ ⓒ) Grid search
- ☐ ⓓ) L2 regularization

Correct answer

- ☒ ⓑ) Synthetic Minority Oversampling (SMOTE)



✓ **26: What is the key benefit of shadow deployments in machine learning models?** 1/1

- ☒ Ⓐ) Evaluate model performance on production data without affecting users ✓
- ☐ Ⓑ) Ensure zero-downtime updates
- ☐ Ⓒ) Prevent overfitting through monitoring
- ☐ Ⓓ) Train models in real-time

✓ **27: Which command in Python enables tracemalloc to capture the peak memory usage of a program?** 1/1

- ☒ Ⓐ) ``tracemalloc.start()`` ✓
- ☐ Ⓑ) ``gc.collect()``
- ☐ Ⓒ) ``psutil.memory_info()``
- ☐ Ⓓ) ``objgraph.show_most_common_types()``

✗ **28: What is the best way to prevent conflicting updates to a shared Terraform state file?** 0/1

- ☐ Ⓐ) Lock the state file using remote backends like S3 with DynamoDB locking
- ☒ Ⓑ) Use ``terraform plan`` before every ``apply`` ✗
- ☐ Ⓒ) Disable auto-scaling temporarily
- ☐ Ⓓ) Store the state file locally and sync changes manually

Correct answer

- ☒ Ⓐ) Lock the state file using remote backends like S3 with DynamoDB locking



✗ **29: Which CRDT structure is best suited for real-time collaborative editing applications?** 0/1

- ☐ Ⓐ G-Counter
- ☐ Ⓑ OR-Set (Observed-Remove Set)
- ☐ Ⓒ LWW-Register (Last-Write-Wins)
- ☒ Ⓓ P2P Priority Queues



Correct answer

- ☒ Ⓑ OR-Set (Observed-Remove Set)

✓ **30: What is the most effective way to mitigate gradient exploding in deep RNNs?** 1/1

- ☐ Ⓐ Layer normalization
- ☒ Ⓑ Truncated Backpropagation Through Time (TBPTT)
- ☐ Ⓒ Batch normalization
- ☐ Ⓓ Weight initialization with Xavier scheme



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