Started on	Wednesday, 4 June 2025, 11:25 AM
State	Finished
Completed on	Wednesday, 4 June 2025, 11:37 AM
Time taken	12 mins 11 secs
Marks	19.00/30.00
Grade	**63.33** out of 100.00

Question 1

Complete

Mark 0.00 out of 1.00

What is the best-case time complexity for inserting in a heap?

- a. O(log n)
- b. O👎
- c. O(1)
- d. O(n log n)

Question 2

Complete

Mark 0.00 out of 1.00

Which of the following sorting algorithms has the best worst-case time complexity?

- a. Merge Sort
- b. Quick Sort
- c. Heap Sort
- d. Insertion Sort

Question 3

Complete

Mark 0.00 out of 1.00

Which of the following loss functions is most commonly used in classification problems?

- a. Mean Squared Error
- b. Cross-Entropy
- c. Hinge Loss
- d. L1 Loss

Question 4

Complete

Mark 1.00 out of 1.00

In a relational database, which normal form eliminates transitive dependencies?

- a. BCNF
- b. 3NF
- c. 2NF
- d. 1NF

Question 5

Complete

Mark 1.00 out of 1.00

Which of the following problems is undecidable?

- a. Halting Problem
- b. Graph Coloring
- c. Sorting a list
- d. Finding the shortest path

Question 6

Complete

Mark 0.00 out of 1.00

Which of the following is a non-parametric model?

- a. Linear Regression
- b. K-Nearest Neighbors
- c. Logistic Regression
- d. Naive Bayes

Question 7

Complete

Mark 1.00 out of 1.00

What does the Bellman Equation define in Reinforcement Learning?

- a. The optimal policy
- b. The action set
- c. The value of a state under a policy
- d. The reward function

Question 8

Complete

Mark 1.00 out of 1.00

Which activation function can cause the vanishing gradient problem?

- a. ReLU
- b. Sigmoid
- c. Tanh
- d. Softmax

Question 9

Complete

Mark 0.00 out of 1.00

Which scheduling algorithm may lead to starvation in OS?

- a. First-Come-First-Serve
- b. Shortest Job First
- c. Round Robin
- d. Priority Scheduling

Question 10

Complete

Mark 1.00 out of 1.00

What does PCA (Principal Component Analysis) aim to achieve?

- a. Increase dimensionality
- b. Normalize features
- c. Train decision trees
- d. Maximize variance in lower dimensions

Question 11

Complete

Mark 0.00 out of 1.00

Which component is not part of a Turing Machine?

- a. Head
- b. State register
- c. Tape
- d. Stack

Question 12

Complete

Mark 0.00 out of 1.00

Which algorithm is used to find strongly connected components in a directed graph?

- a. Kruskal's Algorithm
- b. Prim's Algorithm
- c. Bellman-Ford Algorithm
- d. Kosaraju's Algorithm

Question 13

Complete

Mark 1.00 out of 1.00

What is the time complexity of searching for an element in a balanced Binary Search Tree (BST)?

- a. O(n log n)
- b. O(1)
- c. O(log n)
- d. O(n)

Question 14

Complete

Mark 1.00 out of 1.00

In the context of Operating Systems, what is a "race condition"?

- a. When multiple processes attempt to modify the same data concurrently
- b. When a process is stuck in an infinite loop
- c. When processes terminate unexpectedly
- d. When the CPU switches tasks too quickly

Question 15
Complete
Mark 1.00 out of 1.00

What is the primary function of the attention mechanism in Transformers?

- a. Reduce gradient vanishing
- b. Increase depth of networks
- c. Capture long-range dependencies
- d. Pooling feature maps

Question 16
Complete
Mark 0.00 out of 1.00

What is the primary use of the ELBO (Evidence Lower Bound) in VAEs?

- a. Estimate weight gradients
- b. Regularize output probabilities
- c. Optimize a generative model
- d. Maximize mutual information

Question 17
Complete
Mark 1.00 out of 1.00

What does the Big-O notation O(n log n) represent in divide and conquer algorithms?

- a. Average-case performance
- b. Logarithmic performance
- c. Sub-linear performance
- d. Linear performance

Question 18
Complete
Mark 1.00 out of 1.00

Which of the following is NOT a valid kernel function in SVM?

- a. Step Kernel
- b. Polynomial Kernel
- c. Linear Kernel
- d. Gaussian Kernel

Question 19
Complete
Mark 0.00 out of 1.00

What is the main advantage of using dropout in neural networks?

- a. Faster training
- b. Easier gradient computation
- c. Better weight initialization
- d. Prevent overfitting

Question 20
Complete
Mark 1.00 out of 1.00

What does the term "curse of dimensionality" refer to in ML?

- a. Difficulty in training deep models
- b. Limited model capacity
- c. Increased computation time
- d. Data sparsity in high-dimensional spaces

Question 21
Complete
Mark 1.00 out of 1.00

Which type of neural network is primarily used for sequence modeling?

- a. CNN
- b. RNN
- c. GAN
- d. Autoencoder

Question 22
Complete
Mark 1.00 out of 1.00

What is backpropagation used for in neural networks?

- a. Initializing weights
- b. Performing forward pass
- c. Updating weights via gradients
- d. Computing loss

Question 23
Complete
Mark 1.00 out of 1.00

What is the purpose of a softmax layer in a neural network?

- a. Normalize gradients
- b. Introduce sparsity
- c. Convert logits into probabilities
- d. Prevent overfitting

Question 24
Complete
Mark 1.00 out of 1.00

Which AI concept is best associated with “exploration vs exploitation”?

- a. Reinforcement Learning
- b. Supervised Learning
- c. Unsupervised Learning
- d. Self-supervised Learning

Question 25
Complete
Mark 0.00 out of 1.00

What is the role of the 'learning rate' in gradient descent?

- a. Determines step size during optimization
- b. Regularizes feature importance
- c. Controls model complexity
- d. Determines output layer depth

Question 26
Complete
Mark 1.00 out of 1.00

What is a major limitation of convolutional neural networks (CNNs)?

- a. Inability to capture spatial hierarchies
- b. Lack of parallelism
- c. Overfitting on small datasets
- d. Inefficiency in handling sequential data

Question 27

Complete

Mark 1.00 out of 1.00

What is the primary objective of feature scaling in ML?

- a. Ensure features contribute equally during training
- b. Eliminate irrelevant features
- c. Improve model interpretability
- d. Reduce memory usage

Question 28

Complete

Mark 0.00 out of 1.00

In graph theory, what is the minimum number of colors needed for a graph with chromatic number k?

- a. Depends on graph size
- b. k
- c. k^2
- d. $\log_2(k)$

Question 29

Complete

Mark 1.00 out of 1.00

Which technique is used to prevent exploding gradients in RNNs?

- a. Weight decay
- b. Dropout
- c. Batch normalization
- d. Gradient clipping

Question 30

Complete

Mark 1.00 out of 1.00

Which data structure allows insertion and deletion from both ends?

- a. Priority Queue
- b. Queue
- c. Stack
- d. Deque