Started on	Wednesday, 4 June 2025, 3:26 PM
State	Finished
Completed on	Wednesday, 4 June 2025, 3:38 PM
Time taken	11 mins 51 secs
Marks	24.00/30.00
Grade	**80.00** out of 100.00

Question 1

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 2

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 the CPU switches tasks too quickly
- c. When processes terminate unexpectedly
- d. When a process is stuck in an infinite loop

Question 3

Complete

Mark 1.00 out of 1.00

Which data structure allows insertion and deletion from both ends?

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

Question 4

Complete

Mark 1.00 out of 1.00

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

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

Question 5

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

Question 6

Complete

Mark 1.00 out of 1.00

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

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

Question 7

Complete

Mark 1.00 out of 1.00

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

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

Question 8

Complete

Mark 1.00 out of 1.00

What is backpropagation used for in neural networks?

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

Question 9

Complete

Mark 1.00 out of 1.00

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

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

Question 10

Complete

Mark 1.00 out of 1.00

What is the primary objective of feature scaling in ML?

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

Question 11

Complete

Mark 1.00 out of 1.00

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

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

Question 12

Complete

Mark 1.00 out of 1.00

Which AI concept is best associated with "exploration vs exploitation"?

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

Question 13

Complete

Mark 1.00 out of 1.00

Which of the following problems is undecidable?

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

Question 14

Complete

Mark 1.00 out of 1.00

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

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

Question 15

Complete

Mark 0.00 out of 1.00

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

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

Question 16

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. Overfitting on small datasets
c. Inefficiency in handling sequential data
d. Lack of parallelism

Question 17

Complete

Mark 1.00 out of 1.00

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

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

Question 18

Complete

Mark 0.00 out of 1.00

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

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

Question 19

Complete

Mark 1.00 out of 1.00

Which technique is used to prevent exploding gradients in RNNs?

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

Question 20

Complete

Mark 1.00 out of 1.00

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

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

Question 21

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

Question 22

Complete

Mark 1.00 out of 1.00

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

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

Question 23

Complete

Mark 0.00 out of 1.00

What does the Bellman Equation define in Reinforcement Learning?

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

Question 24

Complete

Mark 1.00 out of 1.00

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

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

Question 25

Complete

Mark 0.00 out of 1.00

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

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

Question 26

Complete

Mark 1.00 out of 1.00

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

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

Question 27

Complete

Mark 0.00 out of 1.00

Which activation function can cause the vanishing gradient problem?

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

Question 28

Complete

Mark 1.00 out of 1.00

Which scheduling algorithm may lead to starvation in OS?

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

Question 29

Complete

Mark 1.00 out of 1.00

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

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

Question 30

Complete

Mark 1.00 out of 1.00

Which of the following is a non-parametric model?

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