

Started on Wednesday, 4 June 2025, 3:25 PM**State** Finished**Completed on** Wednesday, 4 June 2025, 3:36 PM**Time taken** 10 mins 40 secs**Marks** 22.00/30.00**Grade** 73.33 out of 100.00**Question 1**

Complete

Mark 1.00 out of 1.00

Which data structure allows insertion and deletion from both ends?

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

Question 2

Complete

Mark 0.00 out of 1.00

Which scheduling algorithm may lead to starvation in OS?

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

Question 3

Complete

Mark 1.00 out of 1.00

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

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

Question 4

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

Question 5

Complete

Mark 1.00 out of 1.00

Which component is not part of a Turing Machine?

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

Question 6

Complete

Mark 1.00 out of 1.00

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

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

Question 7

Complete

Mark 0.00 out of 1.00

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

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

Question 8

Complete

Mark 1.00 out of 1.00

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

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

Question 9

Complete

Mark 1.00 out of 1.00

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

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

Question 10

Complete

Mark 1.00 out of 1.00

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

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

Question 11

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. Estimate weight gradients
- ☒ c. Regularize output probabilities
- ☐ d. Optimize a generative model

Question 12

Complete

Mark 1.00 out of 1.00

Which activation function can cause the vanishing gradient problem?

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

Question 13

Complete

Mark 0.00 out of 1.00

Which of the following is a non-parametric model?

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

Question 14

Complete

Mark 0.00 out of 1.00

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

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

Question 15

Complete

Mark 1.00 out of 1.00

Which of the following problems is undecidable?

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

Question 16

Complete

Mark 0.00 out of 1.00

What does the Bellman Equation define in Reinforcement Learning?

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

Question 17

Complete

Mark 1.00 out of 1.00

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

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

Question 18

Complete

Mark 1.00 out of 1.00

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

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

Question 19

Complete

Mark 1.00 out of 1.00

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

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

Question 20

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 21

Complete

Mark 1.00 out of 1.00

What is backpropagation used for in neural networks?

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

Question 22

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. L1 Loss
- ☐ c. Cross-Entropy
- ☐ d. Hinge Loss

Question 23

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. Quick Sort
- ☒ c. Merge Sort
- ☐ d. Heap Sort

Question 24

Complete

Mark 0.00 out of 1.00

Which technique is used to prevent exploding gradients in RNNs?

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

Question 25

Complete

Mark 1.00 out of 1.00

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

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

Question 26

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. Sub-linear performance
- ☐ c. Linear performance
- ☐ d. Logarithmic performance

Question 27

Complete

Mark 1.00 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. $O(\text{👉})$

Question 28

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. $O(\log n)$
- ☐ b. $O(1)$
- ☐ c. $O(n)$
- ☐ d. $O(n \log n)$

Question 29

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. Pooling feature maps
- ☒ d. Capture long-range dependencies

Question 30

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