1. What is the technique used to measure the similarity between data points in K-Means Algorithm?

a) Euclidean Distance

b) Manhattan Distance

c) Mahalanobis Distance

d) Cosine Similarity

Answer: A. Euclidean Distance

2. Which method is used to combine the outputs of multiple weak learners in Boosting?

a) Weighted Sum

b) Max Voting

c) Average

d) Majority Voting

Answer: A. Weighted Sum

3. What is the primary purpose of Bagging in ensemble learning?

a) Reduce Variance

b) Increase Bias

c) Improve Interpretability

d) Enhance Scalability

Answer: A. Reduce Variance

4. Which technique involves training multiple models on different subsets of the training data?

a) Bootstrap Aggregating

b) Dropout

c) Regularization

d) Batch Normalization

Answer: A. Bootstrap Aggregating

5. What is the key characteristic of Ensemble Learning?

a) Combination of Weak Learners

b) Use of Single Strong Learner

c) Use of Sequential Training

d) Application of Reinforcement Learning

Answer: A. Combination of Weak Learners

6. Which ensemble learning technique places equal weights on the predictions of all classifiers?

a) Majority Voting

b) Weighted Voting

c) Stacking

d) Boosting

Answer: A. Majority Voting

7. What is the primary advantage of using ensemble methods in machine learning?

a) Improved Performance

b) Reduced Complexity

c) Reduced Variance

d) Increased Bias

Answer: A. Improved Performance

8. Which technique involves iteratively adjusting the weights of misclassified samples in Boosting?

a) AdaBoost

b) Gradient Boosting

c) XGBoost

d) LightGBM

Answer: A. AdaBoost

9. What is the primary objective of boosting algorithms?

a) Sequentially Improve Model

b) Reduce Model Complexity

c) Increase Interpretability

d) Decrease Bias

Answer: A. Sequentially Improve Model

10. Which algorithm constructs the decision boundary by fitting a sequence of weak learners?

a) Gradient Boosting

b) AdaBoost

c) Random Forest

d) Bagging

Answer: A. Gradient Boosting

11. What is the primary limitation of AdaBoost algorithm?

a) Sensitive to Noisy Data

b) Overfitting

c) Requires Large Dataset

d) Prone to Underfitting

Answer: A. Sensitive to Noisy Data

12. Which ensemble learning method trains multiple models independently and then combines their predictions?

a) Bagging

b) Boosting

c) Stacking

d) Random Forest

Answer: A. Bagging

13. What is the main advantage of using Random Forest over a single Decision Tree?

a) Reduced Overfitting

b) Increased Interpretability

c) Faster Training Time

d) Higher Complexity

Answer: A. Reduced Overfitting

14. Which technique is used to introduce randomness in Random Forests?

a) Bootstrap Sampling

b) Gradient Descent

c) Back Propagation

d) Feature Scaling

Answer: A. Bootstrap Sampling

15. What is the purpose of feature subsampling in Random Forests?

a) Decorrelate Trees

b) Increase Variance

c) Decrease Bias

d) Improve Interpretability

Answer: A. Decorrelate Trees

16. Which algorithm constructs multiple decision trees and combines their predictions through voting?

a) Random Forest

b) AdaBoost

c) Gradient Boosting

d) Bagging

Answer: A. Random Forest

17. What is the concept of feature bagging in Random Forests?

a) Randomly selecting subsets of features

b) Randomly selecting subsets of samples

c) Randomly selecting subsets of trees

d) Randomly selecting subsets of splits

Answer: A. Randomly selecting subsets of features

18. What is the key difference between Bagging and Boosting techniques?

a) Weighting of Samples

b) Weighting of Trees

c) Weighting of Features

d) Weighting of Classifiers

Answer: A. Weighting of Samples

19. Which algorithm constructs an ensemble of decision trees with different subsets of training data?

a) Bagging

b) Random Forest

c) AdaBoost

d) Gradient Boosting

Answer: A. Bagging

20. What is the main advantage of ensemble learning methods such as Bagging and Boosting?

a) Improved Generalization

b) Reduced Variance

c) Decreased Complexity

d) Increased Bias

Answer: A. Improved Generalization

21. Which ensemble method constructs decision trees sequentially with each tree correcting the errors of the previous one?

a) AdaBoost

b) Gradient Boosting

c) Random Forest

d) Bagging

Answer: A. AdaBoost

22. What is the primary disadvantage of ensemble learning methods like Bagging and Boosting?

a) Increased Computational Complexity

b) Decreased Model Performance

c) Reduced Variance

d) Reduced Interpretability

Answer: A. Increased Computational Complexity

23. Which technique is used to reduce the variance of individual decision trees in Random Forests?

a) Feature Bagging

b) Bootstrap Sampling

c) Gradient Boosting

d) AdaBoost

Answer: A. Feature Bagging

24. What is the main characteristic of ensemble learning methods like Bagging and Boosting?

a) Diversity of Models

b) Homogeneity of Models

c) Single Model Approach

d) Noisy Predictions

Answer: A. Diversity of Models

25. Which ensemble learning technique combines multiple weak learners into a single strong learner through a weighted sum of their predictions?

a) Stacking

b) AdaBoost

c) Gradient Boosting

d) Random Forest

Answer: A. Stacking

26. What is the main advantage of using Random Forest over a single Decision Tree?

a) Reduced Overfitting

b) Increased Interpretability

c) Faster Training Time

d) Higher Complexity

Answer: A. Reduced Overfitting

27. Which technique is used to introduce randomness in Random Forests?

a) Bootstrap Sampling

b) Gradient Descent

c) Back Propagation

d) Feature Scaling

Answer: A. Bootstrap Sampling

28. What is the purpose of feature subsampling in Random Forests?

a) Decorrelate Trees

b) Increase Variance

c) Decrease Bias

d) Improve Interpretability

Answer: A. Decorrelate Trees

29. Which algorithm constructs multiple decision trees and combines their predictions through voting?

a) Random Forest

b) AdaBoost

c) Gradient Boosting

d) Bagging

Answer: A. Random Forest

30. What is the concept of feature bagging in Random Forests?

a) Randomly selecting subsets of features

b) Randomly selecting subsets of samples

c) Randomly selecting subsets of trees

d) Randomly selecting subsets of splits

Answer: A. Randomly selecting subsets of features

31. What is the key difference between Bagging and Boosting techniques?

a) Weighting of Samples

b) Weighting of Trees

c) Weighting of Features

d) Weighting of Classifiers

Answer: A. Weighting of Samples

32. Which algorithm constructs an ensemble of decision trees with different subsets of training data?

a) Bagging

b) Random Forest

c) AdaBoost

d) Gradient Boosting

Answer: A. Bagging

33. What is the main advantage of ensemble learning methods such as Bagging and Boosting?

a) Improved Generalization

b) Reduced Variance

c) Decreased Complexity

d) Increased Bias

Answer: A. Improved Generalization

34. Which ensemble method constructs decision trees sequentially with each tree correcting the errors of the previous one?

a) AdaBoost

b) Gradient Boosting

c) Random Forest

d) Bagging

Answer: A. AdaBoost

35. What is the primary disadvantage of ensemble learning methods like Bagging and Boosting?

a) Increased Computational Complexity

b) Decreased Model Performance

c) Reduced Variance

d) Reduced Interpretability

Answer: A. Increased Computational Complexity

36. Which technique is used to reduce the variance of individual decision trees in Random Forests?

a) Feature Bagging

b) Bootstrap Sampling

c) Gradient Boosting

d) AdaBoost

Answer: A. Feature Bagging

37. What is the main characteristic of ensemble learning methods like Bagging and Boosting?

a) Diversity of Models

b) Homogeneity of Models

c) Single Model Approach

d) Noisy Predictions

Answer: A. Diversity of Models

38. Which ensemble learning technique combines multiple weak learners into a single strong learner through a weighted sum of their predictions?

a) Stacking

b) AdaBoost

c) Gradient Boosting

d) Random Forest

Answer: A. Stacking

39. What is the primary objective of Dimensionality Reduction techniques?

a) Preserve Data Structure

b) Reduce Model Complexity

c) Increase Dimensionality

d) Enhance Computational Speed

Answer: A. Preserve Data Structure

40. Which method is used to find the optimal projection to discriminate between classes in Linear Discriminant Analysis?

a) Fisher Criterion

b) PCA

c) Factor Analysis

d) ICA

Answer: A. Fisher Criterion

41. What is the main advantage of Principal Component Analysis (PCA)?

a) Capture Maximum Variance

b) Handles Non-Linearity

c) Suitable for Categorical Data

d) Requires Feature Engineering

Answer: A. Capture Maximum Variance

42. Which technique assumes that the observed data are generated by a linear combination of some underlying factors?

a) Factor Analysis

b) PCA

c) LDA

d) ICA

Answer: A. Factor Analysis

43. What is the purpose of Independent Component Analysis (ICA)?

a) Extract Independent Sources

b) Maximize Variance

c) Minimize Dimensionality

d) Preserve Data Structure

Answer: A. Extract Independent Sources

44. Which method focuses on preserving the local structure of the data during dimensionality reduction?

a) Locally Linear Embedding

b) PCA

c) Factor Analysis

d) Independent Component Analysis

Answer: A. Locally Linear Embedding

45. What is the primary objective of Isomap algorithm?

a) Preserve Geodesic Distances

b) Maximize Variance

c) Minimize Reconstruction Error

d) Reduce Computational Complexity

Answer: A. Preserve Geodesic Distances

46. Which optimization technique is commonly used in Locally Linear Embedding (LLE)?

a) Least Squares Optimization

b) Gradient Descent

c) Random Search

d) Evolutionary Algorithms

Answer: A. Least Squares Optimization

47. What is the key concept behind Evolutionary Learning?

a) Mimicking Natural Selection

b) Gradient Descent

c) Random Search

d) Pattern Recognition

Answer: A. Mimicking Natural Selection

48. Which technique in Evolutionary Learning selects the best individuals for reproduction based on their fitness?

a) Genetic Algorithms

b) Neural Networks

c) Decision Trees

d) Support Vector Machines

Answer: A. Genetic Algorithms

49. What is the term for the offspring produced by combining genetic material from two parent individuals?

a) Genetic Offspring

b) Generational Offspring

c) Evolutionary Offspring

d) Parental Offspring

Answer: A. Genetic Offspring

50. Which operators are used to modify the genetic material during the reproduction process in Genetic Algorithms?

a) Genetic Operators

b) Logical Operators

c) Arithmetic Operators

d) Boolean Operators

Answer: A. Genetic Operators

51. Which operator in Genetic Algorithms is responsible for exploring new regions of the search space?

a) Mutation

b) Crossover

c) Selection

d) Elitism

Answer: A. Mutation

52. What is the primary purpose of Genetic Algorithms?

a) Optimization

b) Classification

c) Clustering

d) Regression

Answer: A. Optimization

53. Which technique in Genetic Algorithms selects individuals for reproduction based on their fitness and probability of selection?

a) Selection

b) Mutation

c) Crossover

d) Elitism

Answer: A. Selection

54. What is the role of crossover operator in Genetic Algorithms?

a) Exchange Genetic Material

b) Introduce Diversity

c) Improve Fitness

d) Explore New Regions

Answer: A. Exchange Genetic Material

55. Which phase of Genetic Algorithms evaluates the fitness of individuals in the population?

a) Evaluation

b) Initialization

c) Selection

d) Mutation

Answer: A. Evaluation

56. What is the main advantage of Genetic Algorithms over traditional optimization techniques?

a) Global Optimization

b) Local Optimization

c) Fast Convergence

d) Less Computational Complexity

Answer: A. Global Optimization

57. Which technique in Genetic Algorithms retains the best-performing individuals in the population for the next generation?

a) Elitism

b) Selection

c) Mutation

d) Crossover

Answer: A. Elitism

58. What is the primary disadvantage of Genetic Algorithms?

a) Computational Complexity

b) Slow Convergence

c) Lack of Parallelism

d) Limited Application

Answer: A. Computational Complexity

59. Which phase of Genetic Algorithms generates an initial population of individuals for optimization?

a) Initialization

b) Evaluation

c) Selection

d) Crossover

Answer: A. Initialization

60. What is the primary objective of crossover operator in Genetic Algorithms?

a) Explore New Solutions

b) Exploit Existing Solutions

c) Improve Diversity

d) Improve Fitness

Answer: A. Explore New Solutions

61. Which type of problem is Genetic Algorithms best suited for?

a) Optimization

b) Classification

c) Clustering

d) Regression

Answer: A. Optimization

62. What is the main challenge of using Genetic Algorithms?

a) Computational Complexity

b) Slow Convergence

c) Lack of Diversity

d) Limited Search Space

Answer: A. Computational Complexity

63. Which operator in Genetic Algorithms is responsible for combining genetic material from parent individuals?

a) Crossover

b) Mutation

c) Selection

d) Elitism

Answer: A. Crossover

64. What is the primary advantage of using Evolutionary Learning techniques?

a) Adaptability

b) Scalability

c) Low Complexity

d) High Interpretability

Answer: A. Adaptability

65. Which technique in Genetic Algorithms introduces random changes in the genetic material of individuals?

a) Mutation

b) Crossover

c) Selection

d) Elitism

Answer: A. Mutation

66. What is the role of fitness function in Genetic Algorithms?

a) Measure Individual Performance

b) Select Parents

c) Create Offspring

d) Evaluate Solutions

Answer: A. Measure Individual Performance

67. Which phase of Genetic Algorithms selects individuals from the current population for reproduction?

a) Selection

b) Initialization

c) Evaluation

d) Crossover

Answer: A. Selection

68. What is the main objective of Genetic Algorithms in optimization tasks?

a) Find Optimal Solutions

b) Minimize Error

c) Maximize Accuracy

d) Optimize Parameters

Answer: A. Find Optimal Solutions

69. Which technique in Genetic Algorithms allows the best-performing individuals to survive from one generation to the next?

a) Elitism

b) Selection

c) Mutation

d) Crossover

Answer: A. Elitism

70. What is the main challenge of using Genetic Algorithms in optimization tasks?

a) Computational Complexity

b) Lack of Guarantee

c) Limited Convergence

d) Sensitivity to Noise

Answer: A. Computational Complexity

71. What is the primary role of crossover operator in Genetic Algorithms?

a) Exchange Genetic Material

b) Introduce Diversity

c) Improve Fitness

d) Explore New Regions

Answer: A. Exchange Genetic Material

72. Which phase of Genetic Algorithms generates an initial population of individuals for optimization?

a) Initialization

b) Evaluation

c) Selection

d) Crossover

Answer: A. Initialization

73. What is the primary objective of crossover operator in Genetic Algorithms?

a) Explore New Solutions

b) Exploit Existing Solutions

c) Improve Diversity

d) Improve Fitness

Answer: A. Explore New Solutions

74. Which technique in Genetic Algorithms allows the best-performing individuals to survive from one generation to the next?

a) Elitism

b) Selection

c) Mutation

d) Crossover

Answer: A. Elitism

75. What is the primary disadvantage of using Genetic Algorithms?

a) Computational Complexity

b) Slow Convergence

c) Lack of Diversity

d) Limited Search Space

Answer: A. Computational Complexity

76. What is the primary objective of Reinforcement Learning?

a) Learn Optimal Actions

b) Minimize Prediction Error

c) Maximize Likelihood

d) Reduce Dimensionality

Answer: A. Learn Optimal Actions

77. Which technique in Reinforcement Learning involves learning from trial and error by interacting with an environment?

a) Q-Learning

b) Supervised Learning

c) Unsupervised Learning

d) Semi-Supervised Learning

Answer: A. Q-Learning

78. What is the role of the reward signal in Reinforcement Learning?

a) Provides Feedback

b) Defines the Policy

c) Shapes the Environment

d) Determines the Model

Answer: A. Provides Feedback

79. Which algorithm in Reinforcement Learning aims to estimate the value of being in a particular state and taking a specific action?

a) Q-Learning

b) SARSA

c) Policy Gradient Methods

d) Deep Q-Networks

Answer: A. Q-Learning

80. What is the term for the function that maps states to the probability distribution over actions in Reinforcement Learning?

a) Policy

b) Value Function

c) Reward Function

d) Transition Probability

Answer: A. Policy

81. What is the main challenge of Reinforcement Learning in complex environments?

a) Exploration vs Exploitation

b) Model Complexity

c) Data Availability

d) Computational Cost

Answer: A. Exploration vs Exploitation

82. Which Reinforcement Learning algorithm updates the Q-values based on the observed rewards and the maximum Q-value of the next state?

a) SARSA

b) Q-Learning

c) Policy Gradient Methods

d) Deep Q-Networks

Answer: A. SARSA

83. What is the primary difference between Q-Learning and SARSA algorithms?

a) Off-Policy vs On-Policy

b) Value vs Policy

c) Deterministic vs Stochastic

d) Exploration vs Exploitation

Answer: A. Off-Policy vs On-Policy

84. What is the primary objective of Markov Chain Monte Carlo (MCMC) methods?

a) Sample from Complex Distributions

b) Optimize Objective Function

c) Reduce Dimensionality

d) Estimate Uncertainty

Answer: A. Sample from Complex Distributions

85. Which technique is used in Markov Chain Monte Carlo (MCMC) to generate proposals for the next state?

a) Proposal Distribution

b) Reward Function

c) Policy

d) Transition Probability

Answer: A. Proposal Distribution

86. What is the primary advantage of using Markov Chain Monte Carlo (MCMC) methods for sampling?

a) Suitable for Complex Distributions

b) Fast Convergence

c) Global Optimization

d) Low Computational Cost

Answer: A. Suitable for Complex Distributions

87. Which method in Markov Chain Monte Carlo (MCMC) iteratively constructs a Markov Chain to sample from a target distribution?

a) Metropolis-Hastings

b) Gradient Descent

c) Back Propagation

d) Evolutionary Algorithms

Answer: A. Metropolis-Hastings

88. What is the role of graphical models in representing probabilistic relationships between variables?

a) Capture Dependencies

b) Model Non-Linearity

c) Reduce Dimensionality

d) Optimize Objective

Answer: A. Capture Dependencies

89. Which type of graphical model represents conditional dependencies between variables through a directed acyclic graph?

a) Bayesian Networks

b) Markov Random Fields

c) Hidden Markov Models

d) Isomap

Answer: A. Bayesian Networks

90. What is the primary objective of Bayesian Networks?

a) Represent Conditional Dependencies

b) Model Temporal Data

c) Capture Latent Variables

d) Estimate Uncertainty

Answer: A. Represent Conditional Dependencies

91. Which type of graphical model represents pairwise relationships between variables through an undirected graph?

a) Markov Random Fields

b) Bayesian Networks

c) Hidden Markov Models

d) Locally Linear Embedding

Answer: A. Markov Random Fields

92. Which type of graphical model is commonly used for image segmentation tasks?

a) Markov Random Fields

b) Bayesian Networks

c) Hidden Markov Models

d) Reinforcement Learning

Answer: A. Markov Random Fields

93. What is the primary characteristic of Hidden Markov Models (HMMs)?

a) Temporal Dynamics

b) Spatial Relationships

c) Non-Stationarity

d) Directed Acyclic Graph

Answer: A. Temporal Dynamics

94. Which method is used to estimate the hidden states in Hidden Markov Models (HMMs) given observed data?

a) Forward-Backward Algorithm

b) Gradient Descent

c) Back Propagation

d) Evolutionary Algorithms

Answer: A. Forward-Backward Algorithm

95. What is the primary application of Hidden Markov Models (HMMs) in machine learning?

a) Sequential Data Modeling

b) Image Classification

c) Regression Analysis

d) Anomaly Detection

Answer: A. Sequential Data Modeling

96. Which method is used to update the probability distribution over states in Hidden Markov Models (HMMs) given observed data?

a) Forward Algorithm

b) Backward Algorithm

c) Baum-Welch Algorithm

d) Viterbi Algorithm

Answer: A. Forward Algorithm

97. What is the main challenge of using Hidden Markov Models (HMMs) in practice?

a) Choosing Appropriate States

b) Estimating Transition Probabilities

c) Handling Missing Data

d) Interpreting Model Outputs

Answer: A. Choosing Appropriate States

98. Which method in Reinforcement Learning deals with the problem of finding the optimal policy in Markov Decision Processes?

a) Dynamic Programming

b) Q-Learning

c) SARSA

d) Policy Gradient Methods

Answer: A. Dynamic Programming

99. What is the primary objective of Markov Chain Monte Carlo (MCMC) methods in machine learning?

a) Sampling from Complex Distributions

b) Optimization

c) Model Interpretability

d) Clustering

Answer: A. Sampling from Complex Distributions

100. Which method is commonly used in Reinforcement Learning to handle sequential decision-making problems with uncertainty?

a) Markov Decision Processes

b) Support Vector Machines

c) K-Nearest Neighbors

d) Random Forest

Answer: A. Markov Decision Processes

101. Which technique in Reinforcement Learning involves modeling the environment as a Markov Decision Process (MDP)?

a) Markov Decision Processes

b) Q-Learning

c) SARSA

d) Policy Gradient Methods

Answer: A. Markov Decision Processes

102. What is the primary benefit of using Markov Chain Monte Carlo (MCMC) methods in Bayesian inference?

a) Approximate Posterior Sampling

b) Exact Posterior Sampling

c) Variational Inference

d) Maximum Likelihood Estimation

Answer: A. Approximate Posterior Sampling

103. Which method in Reinforcement Learning is used for estimating the value function of each state-action pair?

a) Q-Learning

b) SARSA

c) Dynamic Programming

d) Policy Gradient Methods

Answer: A. Q-Learning

104. What is the primary limitation of Markov Chain Monte Carlo (MCMC) methods?

a) Computational Cost

b) Limited Convergence

c) Lack of Parallelism

d) Difficulty in Implementation

Answer: A. Computational Cost

105. Which method in Reinforcement Learning focuses on learning a policy directly without explicitly estimating value functions?

a) Policy Gradient Methods

b) Q-Learning

c) SARSA

d) Dynamic Programming

Answer: A. Policy Gradient Methods

106. What is the key characteristic of Markov Chain Monte Carlo (MCMC) methods in sampling from complex distributions?

a) Markov Chain Property

b) Stochastic Gradient Descent

c) Model Flexibility

d) Reduced Variance

Answer: A. Markov Chain Property

107. Which method in Reinforcement Learning learns the value function by bootstrapping from the estimates of subsequent states?

a) SARSA

b) Q-Learning

c) Dynamic Programming

d) Policy Gradient Methods

Answer: A. SARSA

108. What is the primary advantage of Policy Gradient Methods in Reinforcement Learning?

a) Suitable for Continuous Action Spaces

b) Guaranteed Convergence

c) Reduced Variance

d) Low Computational Cost

Answer: A. Suitable for Continuous Action Spaces

109. Which technique in Reinforcement Learning focuses on directly optimizing the policy with respect to the expected return?

a) Policy Gradient Methods

b) Q-Learning

c) SARSA

d) Dynamic Programming

Answer: A. Policy Gradient Methods

110. What is the main advantage of Markov Chain Monte Carlo (MCMC) methods over traditional Monte Carlo methods?

a) Handles High-Dimensional Spaces

b) Faster Convergence

c) Lower Computational Cost

d) Exact Sampling

Answer: A. Handles High-Dimensional Spaces

111. Which method in Reinforcement Learning is suitable for environments with continuous state and action spaces?

a) Policy Gradient Methods

b) Q-Learning

c) SARSA

d) Dynamic Programming

Answer: A. Policy Gradient Methods

112. What is the primary challenge of Policy Gradient Methods in Reinforcement Learning?

a) High Variance

b) Model Complexity

c) Lack of Exploration

d) Slow Convergence

Answer: A. High Variance

113. Which technique in Reinforcement Learning is prone to the issue of "credit assignment" in long-term rewards?

a) Q-Learning

b) SARSA

c) Dynamic Programming

d) Policy Gradient Methods

Answer: A. Q-Learning

114. What is the primary benefit of using Policy Gradient Methods in Reinforcement Learning?

a) Handles Continuous Action Spaces

b) Exact Learning

c) Model Interpretability

d) Low Computational Cost

Answer: A. Handles Continuous Action Spaces

115. Which method in Reinforcement Learning learns the value function by bootstrapping from the estimate of the subsequent state with the highest value?

a) Q-Learning

b) SARSA

c) Dynamic Programming

d) Policy Gradient Methods

Answer: A. Q-Learning

116. What is the primary limitation of Policy Gradient Methods in Reinforcement Learning?

a) High Variance

b) Slow Convergence

c) Model Complexity

d) Lack of Exploration

Answer: A. High Variance

117. Which Reinforcement Learning algorithm updates the policy parameters in the direction of the gradient of the expected return?

a) Policy Gradient Methods

b) Q-Learning

c) SARSA

d) Dynamic Programming

Answer: A. Policy Gradient Methods

118. What is the primary characteristic of Q-Learning in Reinforcement Learning?

a) Off-Policy Learning

b) On-Policy Learning

c) Direct Policy Optimization

d) Temporal-Difference Learning

Answer: A. Off-Policy Learning

119. Which method in Reinforcement Learning learns the value function by iteratively updating Q-values based on observed rewards and estimated future rewards?

a) Q-Learning

b) SARSA

c) Dynamic Programming

d) Policy Gradient Methods

Answer: A. Q-Learning

120. What is the main advantage of SARSA algorithm in Reinforcement Learning?

a) On-Policy Learning

b) Off-Policy Learning

c) Model Flexibility

d) Low Computational Cost

Answer: A. On-Policy Learning

121. Which Reinforcement Learning algorithm updates the policy based on the action-value function learned from the current policy?

a) SARSA

b) Q-Learning

c) Dynamic Programming

d) Policy Gradient Methods

Answer: A. SARSA

122. What is the primary characteristic of SARSA algorithm in Reinforcement Learning?

a) On-Policy Learning

b) Off-Policy Learning

c) Direct Policy Optimization

d) Temporal-Difference Learning

Answer: A. On-Policy Learning

123. Which method in Reinforcement Learning learns the value function by considering the value of the subsequent state chosen by the current policy?

a) SARSA

b) Q-Learning

c) Dynamic Programming

d) Policy Gradient Methods

Answer: A. SARSA

124. What is the main advantage of Dynamic Programming in Reinforcement Learning?

a) Finds Optimal Policy

b) Suitable for Continuous State Spaces

c) Low Variance

d) Handles Non-Stationarity

Answer: A. Finds Optimal Policy

125. Which method in Reinforcement Learning is commonly used for planning in deterministic environments with known transition dynamics?

a) Dynamic Programming

b) Q-Learning

c) SARSA

d) Policy Gradient Methods

Answer: A. Dynamic Programming