UNIT-V

Fill in the Blanks

1. Reinforcement Learning is based on learning through _____ and punishment.
   Answer: Reward
2. In Reinforcement Learning, the learner is called an _____.
   Answer: Agent
3. A Markov Chain satisfies the _____ property.
   Answer: Markov
4. Monte Carlo methods rely on random _____.
   Answer: Sampling
5. In MCMC, a proposal distribution suggests the next _____.
   Answer: State
6. Bayesian Networks are examples of graphical _____.
   Answer: Models
7. Hidden Markov Models contain hidden _____.
   Answer: States
8. Markov Random Fields are undirected graphical _____.
   Answer: Models
9. Sampling is used to approximate complex probability _____.
   Answer: Distributions
10. In Reinforcement Learning, the environment provides _____ to the agent.
    Answer: Rewards
11. A sequence of states connected probabilistically forms a Markov _____.
    Answer: Chain
12. Bayesian Networks represent variables using directed _____ graphs.
    Answer: Acyclic
13. MCMC stands for Markov Chain Monte Carlo _____.
    Answer: Methods
14. Tracking methods are commonly used in object _____ applications.
    Answer: Tracking
15. Hidden Markov Models are widely used in speech _____.
    Answer: Recognition
16. The policy in Reinforcement Learning defines the agent's _____.
    Answer: Actions
17. Markov Random Fields use _____ edges between nodes.
    Answer: Undirected
18. The "Getting Lost" example is often used to explain _____ Learning.
    Answer: Reinforcement
19. Monte Carlo methods estimate results using repeated random _____.
    Answer: Experiments
20. Graphical models represent dependencies among random _____.
    Answer: Variables

Multiple Choice Questions (MCQs)

1. Reinforcement Learning is mainly based on:
   a) Memorization
   b) Rewards and penalties
   c) Sorting
   d) Clustering
   Answer: b) Rewards and penalties
2. In Reinforcement Learning, who interacts with the environment?
   a) Classifier
   b) Agent
   c) Dataset
   d) Processor
   Answer: b) Agent
3. The Markov property means the future state depends only on:
   a) Entire history
   b) Previous two states
   c) Current state
   d) Random values
   Answer: c) Current state
4. Monte Carlo methods mainly depend on:
   a) Exact formulas
   b) Random sampling
   c) Sorting techniques
   d) Linear equations
   Answer: b) Random sampling
5. MCMC stands for:
   a) Markov Chain Monte Carlo
   b) Machine Chain Model Control
   c) Monte Carlo Markov Chain
   d) Multiple Cluster Monte Carlo
   Answer: a) Markov Chain Monte Carlo
6. Which model uses directed acyclic graphs?
   a) Markov Random Field
   b) Bayesian Network
   c) K-Means
   d) Decision Tree
   Answer: b) Bayesian Network
7. Which graphical model uses undirected graphs?
   a) Bayesian Network
   b) Markov Random Field
   c) Neural Network
   d) Regression Tree
   Answer: b) Markov Random Field
8. Hidden Markov Models are mainly used for:
   a) Clustering
   b) Speech recognition
   c) Sorting
   d) Compression
   Answer: b) Speech recognition

9. In MCMC, the proposal distribution is used to:
   a) Classify data
   b) Generate candidate states
   c) Reduce dimensions
   d) Train networks
   Answer: b) Generate candidate states
10. Which learning method learns through interaction with the environment?
   a) Supervised Learning
   b) Unsupervised Learning
   c) Reinforcement Learning
   d) Semi-supervised Learning
   Answer: c) Reinforcement Learning
11. A Bayesian Network represents probabilistic relationships among:
   a) Images
   b) Random variables
   c) Clusters
   d) Layers
   Answer: b) Random variables
12. Markov Chains are widely used for modeling:
   a) Sequential processes
   b) Sorting algorithms
   c) Databases
   d) Encryption
   Answer: a) Sequential processes
13. Which method estimates probability distributions using random samples?
   a) Linear Regression
   b) Monte Carlo Method
   c) PCA
   d) KNN
   Answer: b) Monte Carlo Method
14. In Reinforcement Learning, a policy defines:
   a) Dataset size
   b) Agent behavior
   c) Cluster center
   d) Error rate
   Answer: b) Agent behavior
15. Hidden states in HMM are:
   a) Directly observable
   b) Not directly observable
   c) Randomly deleted
   d) Constant
   Answer: b) Not directly observable
16. Which graphical model is undirected?
   a) Bayesian Network
   b) Markov Random Field
   c) Decision Tree
   d) Perceptron
   Answer: b) Markov Random Field
17. The “Getting Lost” problem is an example used in:
   a) Clustering

b) Reinforcement Learning
c) Regression
d) Sorting
Answer: b) Reinforcement Learning

18. Tracking methods are commonly applied in:
    a) Object tracking
    b) Data sorting
    c) Database management
    d) Encryption
    Answer: a) Object tracking
19. In MCMC, states are connected through a:
    a) Linear graph
    b) Markov Chain
    c) Decision Tree
    d) Neural Layer
    Answer: b) Markov Chain
20. The main goal of Reinforcement Learning is to maximize:
    a) Errors
    b) Rewards
    c) Dimensions
    d) Features
    Answer: b) Rewards