**Module 1 – Introduction to AI & Logic**

Topics: AI Introduction, Applications, Problem Formulation, Agents, PEAS, Propositional Logic, Predicate Logic, Resolution, Unification  
**Questions:**

1. Define Artificial Intelligence. Explain the characteristics and applications of AI. **[Module 1]**
2. What are intelligent agents? Explain types of intelligent agents with examples. **[Module 1]**
3. Explain PEAS representation with suitable example. **[Module 1]**
4. Differentiate between Propositional logic and Predicate logic. **[Module 1]**
5. Define Well-formed formula (WFF). List the properties of WFF. **[Module 1]**
6. Explain Unification algorithm with suitable example. **[Module 1]**
7. Explain Resolution with example. **[Module 1]**

**✅ Module 2 – Search Strategies**

Topics: BFS, DFS, A\*, Hill Climbing, AO\*, Alpha-beta, Means-End Analysis, Constraint Satisfaction  
**Questions:**  
8. Explain Breadth First Search and Depth First Search. **[Module 2]**  
9. Describe A\* algorithm with example. **[Module 2]**  
10. Compare Uninformed and Informed Search Strategies. **[Module 2]**  
11. Explain Hill Climbing with example. **[Module 2]**  
12. What is AO\* algorithm? Explain with example. **[Module 2]**  
13. Explain Constraint Satisfaction Problem. **[Module 2]**  
14. Write a note on Alpha-beta pruning. **[Module 2]**  
15. Explain Means-Ends Analysis with suitable example. **[Module 2]**

**✅ Module 3 – Neural Networks**

Topics: Artificial Neuron, Perceptron, Adaline, Activation Functions, Gradient Descent  
**Questions:**  
16. Explain architecture of Artificial Neural Network. **[Module 3]**  
17. Define Perceptron Learning Rule with architecture. **[Module 3]**  
18. What is Adaline? How is it different from Perceptron? **[Module 3]**  
19. Explain any two activation functions. **[Module 3]**  
20. Explain Gradient Descent optimization algorithm. **[Module 3]**

**✅ Module 4 – Machine Learning Basics**

Topics: ML Types, Bias-Variance, Evaluation, Feature Selection, PCA, Supervised/Unsupervised, Reinforcement Learning  
**Questions:**  
21. Explain different types of learning in ML. **[Module 4]**  
22. What is inductive bias? Explain with an example. **[Module 4]**  
23. What is overfitting and underfitting? How to handle them? **[Module 4]**  
24. Explain Confusion Matrix and its metrics (Precision, Recall). **[Module 4]**  
25. Write a note on Forward and Backward feature selection. **[Module 4]**  
26. Explain Principal Component Analysis (PCA). **[Module 4]**  
27. Compare Supervised and Unsupervised Learning. **[Module 4]**  
28. Define Reinforcement Learning with example. **[Module 4]**

**✅ Module 5 – Forecasting, SVM & Clustering**

Topics: Logistic Regression, Bayes, Naive Bayes, SVM, Bayesian Belief Networks, Clustering, Bias-Variance Tradeoff  
**Questions:**  
29. Explain Naive Bayes Classifier with an example. **[Module 5]**  
30. What is Logistic Regression? Where is it used? **[Module 5]**  
31. Explain Bayesian Belief Network with neat diagram. **[Module 5]**  
32. What is SVM? Define optimal separating hyperplane. **[Module 5]**  
33. Explain Soft Margin Hyperplane and Kernel Trick. **[Module 5]**  
34. Explain EM Algorithm used in clustering. **[Module 5]**

**✅ Module 6 – Ensemble Methods**

Topics: Bagging, Boosting, AdaBoost, Random Forest, Stacking, Bootstrapping  
**Questions:**  
35. What is Ensemble Learning? Explain Bagging and Boosting. **[Module 6]**  
36. Explain Random Forest and its working. **[Module 6]**  
37. Write short note on AdaBoost algorithm. **[Module 6]**  
38. Compare Bagging vs Boosting vs Stacking. **[Module 6]**