CSA 601 -- PROBLEM SOLVING THROUGH AI&ML	
Question Bank	
S.No	**Question**
1	List any two applications of ML in the healthcare industry.
2	How is ML used in the financial services sector?
3	Mention two use cases of ML in retail.
4	Why is ML important in the manufacturing domain?
5	Name two ML-driven innovations in the hospitality industry.
6	Define churn in customer analytics.
7	What is survival modeling in churn prediction?
8	Why is credit card fraud analysis considered an imbalanced problem?
9	How does a neural network help in fraud detection?
10	List two challenges in churn prediction.
11	What is a bag-of-words model?
12	Define tokenization in NLP.
13	Why is stop word removal important in text preprocessing?
14	What is the use of a word cloud?
15	List two properties of words used in sentiment analysis.
16	Define time series forecasting.
17	What is meant by trend analysis?
18	Differentiate between cyclical and seasonal variation.
19	What is ARIMA in time series modeling?
20	Mention any one application of Holt-Winters method.
21	What is collaborative filtering?
22	Distinguish between user-based and item-based recommenders.
23	Define singular value decomposition in the context of recommendation.
24	What is customer segmentation?
25	How is social network analysis used in recommendations?
26	List five industries where machine learning is applied and provide one example for each.
27	Explain how machine learning improves decision-making in healthcare compared to traditional methods.
28	Given a retail scenario, suggest how machine learning can optimize inventory management.
29	Compare the use of machine learning in fraud detection (financial services) vs. predictive maintenance (manufacturing).
30	Assess the ethical implications of using machine learning in hiring processes within the hospitality industry.
31	Propose a machine learning solution to reduce patient wait times in hospitals.
32	Describe how recommendation systems enhance customer experience in e-commerce.
33	How can machine learning improve demand forecasting in supply chain management?
34	Differentiate between supervised and unsupervised learning with industry-specific examples.
35	Critique the challenges of implementing AI-driven automation in manufacturing.
36	Apply predictive modeling techniques to analyze customer churn and detect fraudulent transactions.
37	Define customer churn and list three factors that influence it.
38	Explain why imbalanced datasets are problematic in fraud detection.
39	Given a dataset with 95% non-fraudulent transactions, suggest techniques to handle class imbalance.
40	Compare logistic regression and neural networks for churn prediction.
41	Assess the effectiveness of survival analysis in subscription-based business models.
42	Design a neural network architecture for credit card fraud detection.
43	How does feature engineering improve churn prediction models?
44	Implement SMOTE (Synthetic Minority Over-sampling Technique) on an imbalanced dataset.
45	Why is recall more important than accuracy in fraud detection models?
46	Justify the use of ensemble methods over single models in fraud detection.
47	List the steps involved in text preprocessing.
48	Explain the significance of stop word removal in text analysis.
49	Convert the sentence "Machine learning is amazing!" into a bag-of-words representation.
50	Compare TF-IDF with word embeddings (e.g., Word2Vec) for text representation.

51	Assess the impact of incorrect spellings on sentiment analysis accuracy.
52	Develop a Python script to tokenize and remove punctuation from a given text.
53	How does stemming differ from lemmatization?
54	Generate a word cloud for a given customer review dataset.
55	Why is sentiment analysis useful in brand reputation management?
56	Critique the limitations of bag-of-words in capturing semantic meaning.
57	Define autocorrelation in time series analysis.
58	Explain the difference between trend and seasonality in time series data.
59	Calculate a 3-month moving average for the given sales data.
60	Compare ARIMA and Holt-Winters for seasonal time series forecasting.
61	Assess the impact of outliers on time series forecasting accuracy.
62	Develop an ARIMA model to forecast stock prices for the next 30 days.
63	Why is stationarity important in time series modeling?
64	Perform differencing to make a non-stationary time series stationary.
65	How does Box-Jenkins methodology improve forecasting models?
66	Justify the selection of exponential smoothing over moving averages for demand forecasting.
67	List the three main types of recommender systems.
68	Explain how collaborative filtering differs from content-based filtering.
69	Given a user-item interaction matrix, compute cosine similarity between two users.
70	Compare user-based and item-based collaborative filtering approaches.
71	Assess the cold-start problem in recommender systems and suggest solutions.
72	Design a hybrid recommender system combining collaborative and content-based filtering.
73	How does Singular Value Decomposition (SVD) improve recommendation accuracy?
74	Perform customer segmentation using K-means clustering on a given dataset.
75	Why is dimensionality reduction important in recommender systems?
76	Critique the role of social network analysis in personalized recommendations.