


PRACTICE PAPER-4
CLASS X
ARTIFICIAL INTELLIGENCE (CODE 417)
(SOLUTIONS)

1. (i) Decision-making (ii) (a) Exclamatory
(iii) (d) A is false but R is true. (iv) (d) Environmental Entrepreneurs
(v) (c) Filtering the network (vi) (c) Natural Gas
2. (i) (a) Both A and R are true and R is the correct explanation for A.
(ii) (c) Generating essay on a topic
(iii) (b) Grouping customers based on purchasing power
- (iv) (a) 
- (v) (b) News Aggregator
(vi) (b) Recall = (True Positive/All Actual Positives)
3. (i) (c) Prediction = True, Actual = False
(ii) (b) Assessing model performance
(iii) (b) Stemming may create non-words and lemmatization uses parts-of-speech tagging.
(iv) (b) Video Compression
(v) Supervised Learning
(vi) Segmentation
4. (i) Reinforcement Learning
(ii) (c) Statement 1 is correct but Statement 2 is incorrect.
(iii) (d) The chatbot does not need any dataset for training.
(iv) (d) Nominal
(v) (c) Localization
(vi) Overfitting
5. (i) (b) Reinforcement Learning
(ii) (d) Facebook post
(iii) (a) Image Classification
(iv) (c) Designing the structure and conversation flow of chatbot
(v) (a) Modelling
(vi) Evaluation
6. The 4Rs (Reduce, Refuse, Reuse, Recycle) support sustainability by minimizing waste. Daily practices include reusing materials and recycling paper or plastic.
7. Successful entrepreneurs possess passion, resilience, adaptability and a strong work ethic. These qualities enable them to learn from failures and seize new opportunities in a constantly evolving business environment.
8. External barriers to communication are physical distance, language differences and cultural nuances. To mitigate these, leverage technology, promote cultural awareness training and establish clear communication protocols.

9. A firewall filters and monitors network traffic, blocking unauthorized access. However, it cannot prevent internal threats or malware spread through trusted applications.
10. Two types of stress are Eustress and Distress. Eustress, like a challenging project, motivates and drives personal growth. Distress, *e.g.*, constant pressure, can lead to anxiety, depression or physical health issues.
11. Developers can address AI bias by using diverse and representative datasets, implementing fairness metrics and conducting regular audits to identify and mitigate biases.
12. The healthcare team should use unsupervised learning, specifically anomaly detection techniques, as they don't have labelled data for rare diseases.
13. Vikram should consider Accuracy to measure overall correct predictions and F1 Score to balance precision and recall, ensuring both the model's effectiveness in prediction and reliability in handling imbalanced classes.
14. In the given sentence, words like 'not' and 'but' retain sentence meaning during stop-word filtering, preserving the sentence's meaning and ensuring accurate context.
15. Data exploration is crucial for understanding the data's characteristics, identifying patterns and cleaning it. This helps in selecting appropriate algorithms, training models effectively and improving overall model performance.

16.		Predicted Positive	Predicted Negative
	Actual Positive	400	25
	Actual Negative	75	350

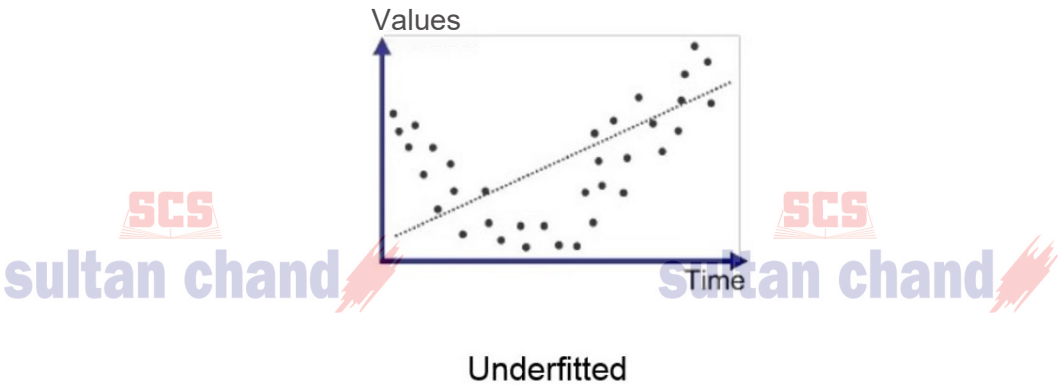
17. Machine Learning refers to computers learning from experience, like how we learn from practice. Instead of being programmed for every task, a computer looks at examples, recognizes patterns and gets better over time. For example, when a phone recognizes faces in photos, it is using machine learning to improve accuracy as it sees more faces.
18. To evaluate her model, Riya can use metrics like:
 - **Accuracy:** How often the model correctly predicts house prices.
 - **Precision:** How many of the predicted prices are actually correct.
 - **Recall:** How many of the actual house price are correctly predicted.

These metrics will help Riya understand how well her model performs, identify areas for improvement and make informed decisions about how to refine it.

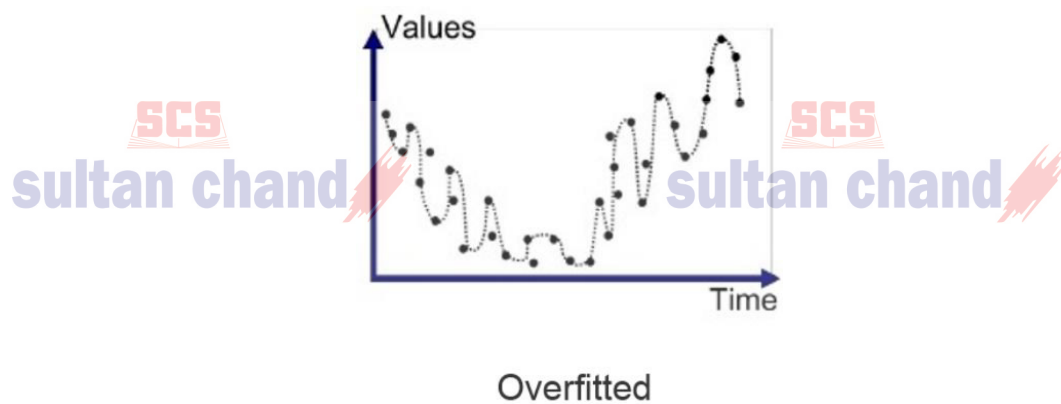
19. (a) Input Layer
(b) Hidden Layer
(c) Output Layer

Input layer receives the initial data, *e.g.*, an image or text. This data is then processed through one or more hidden layers, where it undergoes a series of transformations and calculations. Finally, the output layer produces the final result of the neural network analysis, such as a classification, prediction or decision.

20. **Underfitting:** In underfitting, the model is too simple to capture the underlying patterns in the data. It performs poorly on both training and test data.



Overfitting: In overfitting, the model is too complex and has memorized the training data. It performs well on the training data but poorly on new, unseen data.



Ideally, when the model makes predictions with zero error, it is said to have a good fit on the data. This situation is achievable at a spot between overfitting and underfitting.

21. **Precision:** $35 / (35 + 25) = 0.58$

Recall: $35 / (35 + 15) = 0.70$

Precision-Recall Trade-off: Precision and Recall don't always go hand in hand. When you try to improve one of these measures, the other might get worse. This is known as Precision-Recall Trade-off. Balance depends on application needs.

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