PRACTICE PAPER-1
CLASS X
ARTIFICIAL INTELLIGENCE (CODE 417)
(SOLUTIONS)

1. (i) Time Management
(ii) (c) A person who starts and operates a new business venture
(iii) (a) Both A and R are true and R is the correct explanation for A.
(iv) (b) Green Skills
(v) (c) Imperative Sentences
(vi) (c) Windows + E

2. (i) (b) Both A and R are true but R is not the correct explanation for A.
(ii) (a) True Positive
(iii) (c) Predict continuous numerical values
(iv) Facial Recognition
(v) (a) Continuous
(vi) (d) Stop word

3. (i) (a) It updates weights through the network's layers.
(ii) (c) Named Entity Recognition
(iii) Semi-structured
(iv) (b) Data Exploration and Preprocessing
(v) Computer Vision
(vi) (b) Evaluates the model's performance on unseen data

4. (i) (b) A basic unit of Artificial Neural Network (ANN)
(ii) (a) Both Statement 1 and Statement 2 are correct.
(iii) (c) Preprocessing is done after the training stage of the AI lifecycle.
(iv) (d) Traditional Learning Algorithm
(v) (b) Resolution
(vi) Overfitting

5. (i) (b) Natural Language Processing
(ii) (c) Accountability
(iii) (d) NLTK
(iv) (a) Increase model complexity
(v) (c) Time of Birth
(vi) (c) Tables

6. Stress may manifest in individuals as fatigue, anxiety or lack of focus. It is often caused by workload, poor time management or personal issues.

7. A green economy promotes sustainable growth by reducing environmental harm and fostering renewable energy usage. It is vital for future sustainability to balance development and conservation.

8. Barriers to concise communication include over-explanation and ambiguity. These can be overcome by organizing thoughts and using simple, clear language.

9. Ecopreneurs innovate by combining sustainability with profitability and promoting eco-friendly practices. They drive change towards a sustainable future.

10. Steps to safeguard computers from viruses include regularly updating antivirus software, backing up data and avoiding untrusted websites. These practices safeguard systems, further enhancing cybersecurity.

11. Human intelligence excels in abstract reasoning, adaptive problem-solving and original creativity. Artificial intelligence, while faster and more data-driven, often lacks true understanding, emotional context and genuine innovation.

12. Ravi should use supervised learning, specifically regression models, as they predict continuous outputs like house prices based on labelled data.

13. Karan should ensure data accuracy and relevance by verifying sources and cleaning unnecessary data. High-quality data aids in better model performance.

14. Resolution of an image refers to the number of pixels in an image. Higher resolution results in clearer and more detailed images.

15. Stop words like 'can' and 'in' should not be removed as they provide context and structure of the sentence which is essential for sentence comprehension.

16. Confusion Matrix:

	Predicted Positive	**Predicted Negative**
Actual Positive	120	60
Actual Negative	40	80

17. Machine Learning is a branch of AI where computers learn from data without explicit instructions. Instead of relying on predefined rules, they use algorithms to identify patterns and make predictions. For example, a spam filter learns to recognize spam emails by analyzing patterns in previous emails, such as specific words, phrases or senders.

18. Aditya should start by defining his project objectives and identifying the type of data required. He should explore reliable sources like government databases, academic publications or trusted APIs. He should then evaluate data credibility by checking its origin, timeliness and accuracy. Ensuring data relevance helps align it with project goals while high-quality data minimizes errors and biases, leading to more accurate AI models. Data cleaning and preprocessing are essential for maintaining consistency and usability.

19. (A) Semantic Segmentation

(B) Instance Segmentation

Aspect	**Instance Segmentation**	**Semantic Segmentation**
Definition	Identifies and differentiates individual objects in an image	Labels each pixel of an image with a specific class or category
Explanation	Provides precise location of objects and distinguishes between separate instances of the same category	Does not differentiate between individual object instances
Output	Assigns a unique label to each object instance and accurately outlines them with pixel-level accuracy	Labels each pixel with a category label without distinguishing between instances
Use Cases	Object detection and segmentation Counting instances of objects Tracking and monitoring objects individually	Scene understanding and image analysis Image annotation and labelling Robotics and autonomous navigation

Examples	In an image with multiple people, instance segmentation assigns a unique mask or label to each individual person, allowing for accurate separation	In an image with different objects like cars, trees and buildings, semantic segmentation labels each pixel with the corresponding class, such as 'car', 'tree' or 'building'

20. Teaching computers to interpret human language ambiguities is a major challenge in Natural Language Processing (NLP). Ambiguity can stem from words with multiple meanings (lexical ambiguity), unclear sentence structures (syntactic ambiguity) or varying interpretations based on context (semantic ambiguity). NLP techniques like parts-of-speech tagging help resolve lexical ambiguity by analyzing the context of a word. Similarly, grammar checking algorithms help determine correct sentence structure while machine learning models trained on massive datasets can learn to infer the intended meaning based on contextual cues.

21. (i) **True Positive:** 60
False Positive: 30

(ii) **Precision:** 60 / (60 + 30) = 0.67
Recall: 60 / (60 + 20) = 0.75
F1 Score: 2 * (0.67* 0.75) / (0.67 + 0.75) = 0.71