PRACTICE PAPER-3
CLASS X
ARTIFICIAL INTELLIGENCE (CODE 417)
(SOLUTIONS)

1. (i) Emotional Resilience

(ii) (b) Environmental preservation and responsible resource use

(iii) (c) A is true but R is false.

(iv) (c) Pessimistic, Procrastination

(v) (b) Ctrl + V

(vi) (b) Subject, Predicate

2. (i) (d) A is false but R is true.

(ii) (a) What

(iii) (b) Both Statement 1 and Statement 2 are incorrect.

(iv) (d) 

(v) (c) Time of birth

(vi) (a) Continuous

3. (i) (c) Mean Squared Error

(ii) (a) Gap between individuals who have access to technology and those who don't have access to technology

(iii) (a) Data Exploration

(iv) (c) Tagging images

(v) Smart Chatbot

(vi) (b) Evaluation

4. (i) Reinforcement Learning

(ii) (c) Statement 1 is correct but Statement 2 is incorrect.

(iii) (c) Preprocessing of data like normalization is unnecessary for weather prediction models.

(iv) (b) Import Images

(v) (b) Harmonic Mean

(vi) Overfitting

5. (i) (b) Computer Vision

(ii) (c) A large and structured collection of text data

(iii) (c) Stock Prediction

(iv) (d) Pooling Layer

(v) (c) A method of finding entities in sentences

(vi) (d) Sentiment analysis of customer reviews

6. Cookies enhance user experience by remembering preferences and personalizing content. Their misuse can invade privacy by tracking browsing history or through target ads.

7. Entrepreneurship creates jobs, boosts local economies, innovates solutions and promotes economic growth. For instance, startups addressing waste management improve community well-being.

8. Managing stress lowers cortisol, boosts focus and rational thinking, improving decision-making and productivity in both professional life and personal life.

9. Direct objects receive action while indirect objects indicate to/for whom the action is being performed. For example, 'He gave her (indirect) the book (direct).'

10. Neglecting SDG 13 (Climate Action) can lead to severe consequences for future generations. Increasing temperatures, extreme weather events and rise in sea levels can threaten human health, displace communities and disrupt food and water supplies.

11. Here are some potential risks of relying on AI in healthcare, education and transportation:
    - Bias in algorithms
    - Job displacement
    - Lack of transparency
    - Security vulnerabilities
    - Ethical concerns

12. Unsupervised learning should be employed as it analyzes user behaviour. It helps identify patterns, find similarities without labelled data and is suitable for personalized product recommendations.

13. The two factors that she should consider are dataset quality and model compatibility with problem requirements for effective AI project outcomes.

14. In the given text, 'website' (ORG) and 'www.cbse.com' (URL) are named entities. NLP helps identify and extract these entities for tasks like web scraping or information retrieval.

15. OpenCV is a popular Computer Vision library of Python. It offers a comprehensive set of functions for image and video processing, object detection and facial recognition.

16.

	Predicted Positive	**Predicted Negative**
Actual Positive	90	40
Actual Negative	10	130

17. NLP is the technology that empowers voice assistants like Alexa and Siri to understand and respond to human speech. It enables these assistants to convert spoken words into written format through speech recognition, *i.e.*, it analyzes grammar and context of the spoken language to extract key phrases, entities and user intent and formulates appropriate responses, whether it is answering a question or setting a reminder. This allows for a more natural user experience.

18. Data exploration is a crucial step in building an effective sentiment analysis model. By visualizing data distribution through techniques like histograms and scatter plots, it allows for the identification of class imbalances, the detection of outliers and anomalies and the observation of relationships between different features and the overall sentiment. This thorough analysis ensures the model is trained on representative and unbiased data, leading to more accurate and reliable sentiment predictions.

19. (a) **Augmented Reality:** AR overlays digital information onto the real world through devices like smartphones or AR glasses. This can be used for gaming, navigation, education and even remote assistance by providing real-time information and virtual objects within the user's environment.

    (b) **Facial Recognition:** This technology can be used for various applications such as unlocking smartphones, identifying individuals in security systems, enabling personalized experiences in retail and even assisting law enforcement in investigations.

20.

Aspect	Lemmatization	Stemming
Definition	Converts words to their base or dictionary form (lemma)	Reduces words to their root form (stem), which may not be a valid word
Complexity	Higher complexity	Lower complexity
Accuracy	Produces more accurate and meaningful words	Less accurate, may produce non-meaningful stems
Output Example	'Running' → 'run' 'Better' → 'good'	'Running' → 'run' or 'runn' 'Better' → 'bett'
Speed	Slower due to more complex processing	Faster due to simpler rules

21. (a) **Accuracy:** An evaluation metric that measures the overall correctness of a model by calculating the proportion of true predictions (both positive and negative) out of all predictions.

Here, Accuracy = (70 + 80) / (70 + 80 + 20 + 30) = 0.75

(b) **Precision:** An evaluation metric that focuses on the accuracy of positive predictions, calculating the proportion of true positives out of all predicted positives.

Here, Precision = 70 / (70 + 20) = 0.78

(c) **Specificity:** An evaluation metric that measures the ability of a model to correctly identify negative instances, calculating the proportion of true negatives out of all actual negatives.

Here, Specificity = 80 / (80 + 20) = 0.80

(d) **F1 Score:** It is the harmonic mean of precision and recall, balancing both metrics for a more comprehensive evaluation of model performance, especially in imbalanced datasets.

Here, F1 Score = 2 * (0.78 * 0.7) / (0.78 + 0.7) = 0.74

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