SUPERNOVA-LEARNPYTHON
CLASS X : SAMPLE PAPER - 4
ARTIFICIAL INTELLIGENCE (SUBJECT CODE - 417)
MARKING SCHEME
SECTION A: OBJECTIVE TYPE QUESTIONS

1. Answer any 4 out of the given 6 questions on Employability Skills.

  (i)   (d) Reduce, Refuse, Reuse, Recycle, Upcycle

  (ii) (a) Aman Gupta

  (iii) (c) By organizing, prioritizing and managing tasks

  (iv) True

  (v)   (b) Cookies

  (vi) True

2. Answer any 5 out of the given 6 questions.

  (i)   (d) Reinforcement Learning

  (ii) (d) Logical-Mathematical

  (iii) (b) Machine Learning

  (iv) (a) Width, Height

  (v)   (c) Named Entity Recognition

  (vi) (d) All of these

3. Answer any 5 out of the given 6 questions.

  (i)   (c) Classification, Localization

  (ii) -1 to +1

  (iii) (a) 0.97 or 97%

  (iv) (b) Unfair predictions due to discrimination in training data

  (v)   (d) Alpha Channel

  (vi) Stop

4. Answer any 5 out of the 6 given questions.

  (i)   (a) explore, explor

  (ii) False

  (iii) (d) Its example includes generative chatbots

  (iv) (c) Accuracy

  (v)   (a) Cross-Validation

  (vi) False

5. Answer any 5 out of the 6 given questions.

  (i)   (d) Stakeholders

  (ii) (d) matplotlib

  (iii) (a) 2022, 2020

  (iv) (a) 62%

  (v)   (d) All of these

  (vi)   B

SECTION B: SUBJECTIVE TYPE QUESTIONS

Answer any 3 out of the given 5 questions on Employability Skills.   **(2 x 3 = 6 marks)**

Answer each question in 20-30 words.

6. Yes, a computer virus can act like a technical weapon. Computer viruses cause harm to individuals, organizations and to computer systems. For example, the "ILOVEYOU" virus is a malicious program that caused widespread damage and disruption, affecting millions of computers worldwide.

7. Working independently has its own advantages and disadvantages. Being a fresher, I would recommend Adesh to work in a team and take suggestions from seniors and colleagues instead of being rigid as this will help him grasp different perspectives.

8. Written and Visual communication was used by our ancestors to convey their ideas, cultures, religion, history and beliefs to future generations. Earlier, they had no modern technologies with which to communicate and which could pass to future generations without any language barrier.

9. **Green economy** is an economic system that seeks to promote sustainable development by incorporating principles and practices that reduce environmental risks by preserving ecological scarcities.

    Green consumer is an individual who makes purchasing decisions, keeping in mind the environmental and sustainability aspects.

10. The functions or roles of entrepreneurs are:

    (i) **Innovator:** Entrepreneurs often introduce new ideas, products or services to the market.

    (ii) **Risk Manager:** Entrepreneurs manage risks associated with their businesses.

Answer any 4 out of the given 6 questions in 20-30 words each.   **(2 x 4 = 8 marks)**

11.

AI technology		Non-AI technology	
(i)	A software or machine that can operate autonomously and adapt to user behaviour.	(i)	A software or machine that performs a fixed set of functions and does not adapt to user behaviour.
(ii)	Example: Siri	(ii)	Example: MS word

12. RGB stands for RED GREEN BLUE. It represents digital images.

    RGB images are called so because they work on RGB color models which use the primary colors (Red Green Blue) and produces a wide range of colors by combining varying intensities of colors in each channel.

13. Numpy library is mainly used for mathematical calculations. It supports arrays, statistical functions, linear algebra, etc. Pandas can read data, manipulate it and generate insights from it. Pandas can also be used to clean, filter and visualize data.

14.

Supervised machine learning		Unsupervised machine learning	
(i)	Supervised machine learning uses labelled data.	(i)	Unsupervised learning uses unlabelled data.
(ii)	Supervised learning is applicable in Regression and Classification problems.	(ii)	Unsupervised learning is applicable in Clustering and Association problems.

15. Evaluation and Deployment is the final stage in AI project cycle. In evaluation, the trained model's performance is evaluated using evaluation metrics. Once Evaluation is done, the model is deployed to make real-life applications available and this process is called Deployment.

16. Tokenization is a fundamental process that involves breaking down sentences and transforming sentence segmentation into individual units called tokens. These tokens can be words, numbers or special characters occurring in a sentence.

    Tokenizer splits the given sentence (raw data) as:

    ```
    ['If', 'you', 'fail', ',', 'never', 'give', 'up', 'because', 'FAIL',
    'means', '"', 'First', 'Attempt', 'in', 'Learning', '"', '.'].
    ```

    Number of tokens = 17

Answer any 3 out of the given 5 questions in 50-80 words each. (4 x 3 = 12 marks)

17. There are many applications based on NLP which Satya may use to continue his passion independently. Any application that converts speech to text will work for Satya. Such applications may include:

    (a) **Siri or Alexa:** Available on smart devices, Siri is a feature of IOS and is available on iPhone. Alexa, on the other hand, is an Amazon product.

    (b) **Microsoft word:** The feature which recognizes speech and converts it into text is now available on the latest version of Microsoft word.

    (c) Applications like Dictation and Gboard may also work well for Satya.

18. Data Exploration is the third stage in AI project cycle. It is a way to discover hidden patterns, insights and information from data.

    Few data exploration techniques are:

    (a) **Visualization:** It involves charts, graphs, maps, etc. to represent data visually.

    (b) **Summarization, Filtering and Sorting:** These methods involve statistics for overview.

    (c) **Pattern Recognition:** This technique involves looking for repeated patterns and trends.

19. The 4Ws Problem Canvas in AI project cycle is a tool for identifying and organizing key elements related to a problem.

    Who: The 'Who' block focuses on identifying the stakeholders. These stakeholders are directly or indirectly impacted by the problem.

    What: The 'What' block focuses on identifying problems. The goal is to gather specific details like relevant documents, reports, newspaper articles or expert opinions to provide evidence.

    Where: The 'Where' block helps in examining the context, situation and locations related to a specific problem. It helps answer questions such as where the issue exists and whether it is localized to a specific area.

    Why: The 'Why' block focuses on why it is important to solve this problem and how it will benefit the stakeholders involved and society in general.

20. Confusion Matrix for the above situation:

TRUE POSITIVES	FALSE POSITIVES
(600)	(50)
FALSE NEGATIVES	TRUE NEGATIVES
(50)	(50)

    F1 Score= (Precision X recall) / (Precision + Recall)

    To calculate F1 Score, we must calculate Precision and Recall first,

    Precision = (TP) / (TP+FP) = 600 / (600 + 50) = 600 / 650 = 0.92 = 92%

    Recall = (TP) / (TP + FN) = 600 / (600 + 50) = 600 / 650 = 0.92%

    Now,

    F1 Score = (0.92 X 0.92) / 0. 92 + 0.92 = 0.8464 / 1.84 = 0.46 = 46%

21. Yes, AI has exceptional qualities in the decision-making process due to consistency, data processing speed, scalability, etc.

    AI makes decisions by using the following steps:

    Data Collection – Data is collected from different sources.

    Data Preprocessing and Data Exploration – It includes cleaning of data, removing errors, handling missing values, feature selection, visualization, etc.

    Data Modelling – Out of various models, one model is used for training data. The selection of the model is based on the nature of the task.

    Evaluation – In this process, the model's performance is checked using metrics and evaluation techniques.

    After all these steps, the model is ready to give useful insights and enable stakeholders to make decisions.