

CBSE Class 10 Artificial Intelligence Solution

Set 4- 104

Ques 1.

(i) SMART method can be used to set goals to make you successful in your career and personal life. What does 'A' in SMART stand for?

- (a) Abrupt**
- (b) Accountable**
- (c) Achievable**
- (d) Admirable**

Solu. The 'A' in SMART stands for "Achievable," emphasizing that goals should be realistic and within reach to increase the likelihood of success.

(ii) Which of the following is not a key element of self-management skills?

- (a) Prioritising your work**
- (b) Not taking feedback**
- (c) Goal setting**
- (d) Staying updated about new practices**

Solu. Not taking feedback is not a key element of self-management skills because feedback is essential for personal growth and improvement, helping individuals identify areas for development and refine their performance.

(iii) Which of the following is a quality of successful entrepreneurs?

- (a) Hard working**
- (b) Resistance to change**
- (c) Lazy**

(d) Less-confident

Solu. Successful entrepreneurs are characterized by their hardworking nature, as they demonstrate dedication, perseverance, and commitment towards achieving their goals and overcoming challenges in their ventures.

(iv) The most important software in any computer is the This is the software that starts working as soon as we switch on a computer.

- (a) Web Browsers**
- (c) Office Software**
- (b) Operating System**
- (d) Designing Software**

Solu. The most important software in any computer is the Operating System (OS), which is responsible for managing hardware resources, running applications, and facilitating user interactions. It initializes the computer's hardware components and provides a platform for other software to operate.

(v) Which of the following types of communication takes place when one individual addresses a large gathering?

- (a) Written communication**
- (b) Public communication**
- (c) Small group communication**
- (d) Interpersonal communication**

Solu. In public communication, one individual addresses a large gathering, making option (b) the correct answer. Public communication involves delivering information, ideas, or messages to an audience, whether it's through speeches, presentations, or performances, with the intention of informing, persuading, or entertaining a group of people.

(vi) Assertion (A): Organic farming technique is an example of a green skill that is essential for sustainable agriculture.

Reason (R): Organic farming techniques prioritize environment friendly and sustainable practices such as using natural fertilizers, avoiding synthetic pesticides and promoting soil health.

(a) Both (A) and (R) are true and (R) is the correct explanation for (A)

(b) Both (A) and (R) are true and (R) is not the correct explanation of (A).

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

(d) (A) is false, but (R) is true.

Solu. The correct option is (a) Both (A) and (R) are true, and (R) is the correct explanation for (A).

Explanation: Organic farming indeed exemplifies green skills by emphasizing environmentally friendly and sustainable practices such as using natural fertilizers, abstaining from synthetic pesticides, and promoting soil health. This aligns with the assertion that organic farming is an example of a green skill essential for sustainable agriculture, making the reason a correct explanation for the assertion.

Ques 2. Answer any 5 out of given 6 questions:

(i) Which of the following contributes to the efficiency of an AI project?

(a) High Model Complexity

(b) Relevant and Authentic Training Data

(c) Minimal Preprocessing

(d) Limited Hardware Resources

Solu. (i) The correct answer is (b) Relevant and Authentic Training Data.

Explanation: In an AI project, having relevant and authentic training data is crucial for the efficiency of the model. It ensures that the model learns from real-world examples and can generalize well to unseen data, thereby improving its performance.

(ii) (iii)

(ii) This real life application of NLP is used to provide an overview of a news item or blog post, while avoiding redundancy from multiple sources and maximising the diversity of content obtained. Which is this application?

- (a) Chatbot**
- (c) Sentiment Analysis**
- (b) Virtual Assistant**
- (d) Automatic Summarisation**

Solu. The correct answer is (d) Automatic Summarisation.

Explanation: Automatic summarization is the NLP application used to provide an overview of news items or blog posts by condensing the content while maintaining its essence. This process helps in avoiding redundancy from multiple sources and maximizing the diversity of content obtained.

(iii) Which of the following represent a machine that is smart but not considered Artificial Intelligence (AI) enabled ?

- (a) A robotic vacuum cleaner that can navigate and clean floors autonomously.**
- (b) A chatbot that engages in natural language conversations and answers questions.**
- (c) A smartphone with facial recognition for unlocking the device.**
- (d) A digital alarm clock that rings at a set time every morning.**

Solu. The correct answer is (d) A digital alarm clock that rings at a set time every morning.

Explanation: While a digital alarm clock is a smart device, it does not involve Artificial Intelligence (AI). It operates based on pre-set instructions and does not adapt or learn from its environment or user interactions like the other options, which are AI-enabled.

(iv) Which of the following words represent an example of a lemma resulting from lemmatisation for "caring" in context to Natural Language Processing (NLP)?

- (a) Care
- (b) Cared
- (d) Car
- (c) Cares

Solu. The correct answer is (a) Care.

Explanation: Lemmatisation in Natural Language Processing (NLP) involves reducing words to their base or dictionary form, known as lemmas. For the word "caring", the lemma resulting from lemmatisation would be "care", which is the base form of the word. Therefore, option (a) "Care" represents an example of a lemma resulting from lemmatisation for "caring" in the context of NLP.

(v) Intrapersonal Intelligence is a concept that:

- (a) Measures an individual's ability to understand others' emotions and feelings.**
- (b) Assesses one's proficiency in mathematics and logical reasoning.**
- (c) Describes the level of self-awareness someone has, starting from realizing weaknesses, strengths, to recognizing their own feelings.**
- (d) Evaluates an individual's spatial navigation and visualisation skills.**

Solu. The correct answer is:

- (c) Describes the level of self-awareness someone has, starting from realizing weaknesses, strengths, to recognizing their own feelings.

Explanation: Intrapersonal Intelligence refers to an individual's capacity to understand oneself, including their own emotions, strengths, weaknesses, motivations, and goals. It involves self-awareness and introspection, enabling individuals to recognize and manage their emotions effectively. Therefore, option (c) best describes the concept of Intrapersonal Intelligence.

(vi) For Data Science, usually the data is collected in the form of tables. These tabular datasets can be stored in different formats. Which of the following formats is not used for storing data in a tabular format?

- (a) CSV**
- (c) SQL**
- (b) Website**
- (d) Spreadsheet**

Solu. The correct answer is: (b) Website

Explanation: Websites typically do not store tabular data directly. While websites can display data in a tabular format to users, the underlying storage format is usually not in the form of tables. Instead, websites commonly use databases (such as SQL databases) to store data in a structured manner. Options (a) CSV, (c) SQL, and (d) Spreadsheet are all formats commonly used for storing tabular data.

Ques 3. Answer any 5 out of given 6 questions :

(i) is one of the parameter for evaluating a model's performance and is defined as the fraction of positive cases that are correctly identified.

- (a) Precision**
- (b) Accuracy**
- (c) Recall**
- (d) F1**

Solu. The correct answer is: (c) Recall

Explanation: Recall is the parameter that evaluates a model's performance by measuring the fraction of positive cases that are correctly identified out of all actual positive cases.

(ii) In the AI project cycle, which of the following represents the correct order of steps?

- (a) Data Exploration, Problem Scoping, Modelling, Evaluation, Data Acquisition.**

(b) Problem Scoping, Data Acquisition, Data Exploration, Modelling, Evaluation.

(c) Modelling, Data Acquisition, Evaluation, Problem Scoping. Data Exploration.

(d) Data Acquisition, Data Exploration, Problem Scoping. Modelling, Evaluation.

Solu. The correct answer is: (b) Problem Scoping, Data Acquisition, Data Exploration, Modelling, Evaluation.

Explanation: In the AI project cycle, the correct order of steps is typically Problem Scoping, Data Acquisition, Data Exploration, Modelling, and Evaluation. This sequence ensures that the problem is well-defined, relevant data is collected, data is explored to understand its characteristics, models are built, and finally, the performance of the models is evaluated.

(iii) is a concept to unify statistics, data analysis, machine learning and their related methods in order to understand and analyse actual phenomena with data.

(a) Computer Vision

(b) Natural Language Processing

(c) Data Science

(d) Computer Science

Solu. The correct answer is: (c) Data Science

Explanation: Data Science is a concept that unifies statistics, data analysis, machine learning, and related methods to understand and analyze actual phenomena using data.

(iv) In computer vision which of the following tasks is used for multiple objects?

(a) Classification

(b) Classification + Localisation

(c) Instance Segmentation

(d) Localisation

Solu. The correct answer is: (c) Instance Segmentation

Explanation: Instance segmentation is used in computer vision for multiple objects. It involves identifying and delineating each object instance within an image.

(v) In spam email detection, which of the following will be considered as "False Negative"?

- (a) When a legitimate email is accurately identified as not spam.**
- (b) When a spam email is mistakenly identified as legitimate.**
- (c) When an email is accurately recognised as spam.**
- (d) When an email is inaccurately labelled as important.**

Solu. The correct answer is: (b) When a spam email is mistakenly identified as legitimate.

Explanation: In spam email detection, a "False Negative" occurs when a spam email is mistakenly identified as legitimate, meaning it was not correctly classified as spam.

(vi) Which of the following applications is not associated with Natural Language Processing (NLP)?

- (a) Sentiment Analysis**
- (b) Speech Recognition**
- (c) Spam Filtering in emails**
- (d) Stock Market Analysis**

Solu. The correct answer is: (d) Stock Market Analysis

Explanation: Stock Market Analysis is not typically associated with Natural Language Processing (NLP). NLP is more commonly used for tasks like sentiment analysis, speech recognition, and spam filtering in emails.

Ques 4.

(i) Statement 1: Confusion matrix is an evaluation metric.

Statement 2: Confusion Matrix is a record which helps in evaluation.

- (a) Both Statement 1 and Statement 2 are correct.**
- (b) Both Statement 1 and Statement 2 are incorrect.**
- (c) Statement 1 is correct and Statement 2 is incorrect.**
- (d) Statement 2 is correct and Statement 1 is incorrect. T**

Solu. The correct answer is: (a) Both Statement 1 and Statement 2 are correct.

Explanation: Confusion matrix is indeed an evaluation metric commonly used in classification tasks. It provides a record of model performance by summarizing the number of true positives, true negatives, false positives, and false negatives. Therefore, both statements are correct.

(iii) Bag of Words is a model which helps in extracting features out of the text which can be helpful in machine learning algorithms.

- (a) Data Science (DS)**
- (b) Virtual Reality (VR)**
- (c) Natural Language Processing (NLP)**
- (d) Computer Vision (CV)**

Solu. (c) Natural Language Processing (NLP)

Explanation: Bag of Words (BoW) is a common technique in Natural Language Processing (NLP) used to represent text data as numerical feature vectors. These feature vectors can then be used in machine learning algorithms for tasks such as classification, clustering, or sentiment analysis.

(iv) Which of the following represents an example of a recommendation system?

- (a) An online clothing store that offers a wide variety of clothing options.**
- (b) A search engine that retrieves relevant web pages based on user queries.**
- (c) An e-commerce website that displays customer reviews and ratings for products.**

(d) A music streaming platform that suggests songs and playlists based on user listening history.

Solu. (d) A music streaming platform that suggests songs and playlists based on user listening history.

Explanation: This scenario represents a typical example of a recommendation system, where the system suggests items (in this case, songs and playlists) based on the user's past behavior or preferences.

(v) Name any two search engines.

Solu. Two commonly known search engines are:

1. Google
2. Bing

(vi) What is the primary need for evaluating an AI model's performance in the AI Model Development process?

- (a) To increase the complexity of the model.
- (b) To visualize the data.
- (c) To assess how well the chosen model will work in future.
- (d) To reduce the amount of data used for training

Solu. The primary need for evaluating an AI model's performance in the AI Model Development process is: (c) To assess how well the chosen model will work in future.

Ques 5. (i) Assertion (A): The term used to refer to the number of pixels in an image is resolution.

Reason (R) : Resolution in an image denotes the total number of pixels it contains, usually represented as height x width.

- (a) Both (A) and (R) are true and (R) is the correct explanation for (A).
- (b) Both (A) and (R) are true and (R) is not the correct explanation for (A).
- (c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

Solu. The correct answer is: (a) Both (A) and (R) are true and (R) is the correct explanation for (A).

(ii) When a machine possesses the ability to mimic human traits, i.e., make decisions, predict the future, learn, and improve on its own, it is said to have:

- (a) Computational Skills**
- (c) Artificial Intelligence**
- (b) Learning Capability**
- (d) Cognitive Processing**

Solu. When a machine exhibits the capacity to imitate human behavior such as decision-making, future prediction, learning, and self-improvement, it embodies Artificial Intelligence (AI). AI encompasses various technologies and methodologies aimed at enabling machines to perform tasks that traditionally require human intelligence. Through algorithms and data, AI systems can analyze patterns, make decisions, and continuously enhance their performance, contributing to advancements in various fields such as healthcare, finance, and transportation.

(iii) Statement 1: To evaluate a models' performance, we need either precision or recall.

Statement 2: When the value of both Precision and Recall is 1, the F1 score is 0.

- (a) Both statement 1 and statement 2 are correct.**
- (b) Both statement 1 and statement 2 are incorrect.**
- (c) Statement 1 is correct, but statement 2 is incorrect.**
- (d) Statement 1 is incorrect, but statement 2 is correct**

Solu. Statement 1 is correct because precision and recall are two common metrics used to evaluate a model's performance, especially in binary classification tasks. However, statement 2 is incorrect because when both

precision and recall have a value of 1, the F1 score is not necessarily 0; in fact, in such a case, the F1 score would be 1, indicating perfect performance.

(iv) The concept of media platforms. is used to apply face filters on various social

- (a) NLP**
- (c) Data Science**
- (b) Computer Vision**
- (d) Block chain Technology**

Solu. The correct answer is (b) Computer Vision. Computer vision technology is commonly used in media platforms to apply face filters, recognize objects in images or videos, and perform various other visual tasks.

(v) The 4 W's Problem Canvas helps in identifying the key elements related to the given problem.

Which of the following is NOT one of the blocks of the Problem Canvas?

- (a) When**
- (c) What**
- (b) Where**
- (d) Why**

Solu. The correct answer is (b) Where. The 4 W's Problem Canvas typically consists of the following blocks: What, Why, Who, and When. The "Where" block is not typically included in this framework.

(vi) Which domain of AI is used for interacting with virtual assistants such as Siri and Alexa ?

- (a) Machine Learning (ML)**
- (b) Computer Vision (CV)**
- (c) Natural Language Processing (NLP)**
- (d) Technical Vision (TV)**

Solu. The correct answer is (c) Natural Language Processing (NLP). NLP is the domain of AI that deals with the interaction between computers and humans through natural language. Virtual assistants like Siri and Alexa rely heavily on NLP to understand and respond to user commands and queries in a natural language format.

Ques Ques 6.

Give any two examples of how individual choices and behaviors can contribute to achieving sustainable development.

Solu. Individual choices and behaviors play a crucial role in contributing to sustainable development. For instance, opting for sustainable modes of transportation such as cycling or using public transport instead of driving alone can reduce carbon emissions and alleviate traffic congestion, thus promoting environmental sustainability. Another example is adopting eco-friendly practices in daily routines, such as reducing water and energy consumption, recycling, and minimizing waste generation. These small lifestyle changes collectively contribute to conserving natural resources and mitigating environmental degradation, thereby fostering sustainable development.

Ques 7. List any two common misconceptions about entrepreneurship.

Solu. Two common misconceptions about entrepreneurship are that it guarantees overnight success and that it requires a large amount of initial capital investment. In reality, entrepreneurship involves hard work, perseverance, and often entails facing numerous challenges and setbacks before achieving success. Additionally, while some entrepreneurial ventures may require significant capital, many successful businesses have started with minimal funds and relied on innovation and resourcefulness to grow. Understanding these misconceptions is essential for aspiring entrepreneurs to have realistic expectations and make informed decisions.

Ques 8. What is the importance of time management in effectively dealing with stress? Provide any one strategy for improving time management skills to reduce stress.

Solu. Effective time management is crucial for stress management as it helps individuals prioritize tasks, allocate sufficient time for each activity, and maintain a healthy work-life balance. By managing time efficiently, individuals can reduce feelings of overwhelm and anxiety caused by deadlines and workload pressures. One strategy for improving time management skills to reduce stress is using the Eisenhower Matrix, which categorizes tasks based on their urgency and importance. By focusing on tasks that are both urgent and important while delegating or eliminating less critical activities, individuals can optimize productivity and minimize stress levels.

Ques 9.

Mention any two measures that individuals or organizations can take to protect their data from theft and viruses.

Solu. Two measures individuals or organizations can take to protect their data from theft and viruses include regularly updating antivirus software and implementing robust cybersecurity protocols. Updating antivirus software ensures that systems are equipped with the latest security patches and protection against evolving cyber threats. Additionally, implementing strong password policies, encrypting sensitive data, and conducting regular data backups are essential cybersecurity measures to safeguard against data breaches and unauthorized access. Moreover, providing cybersecurity training and awareness programs to employees can help mitigate the risk of human error and enhance overall data security.

Ques 10. The method of communication that you choose could affect the relationship with your peers, superiors, and customers. Write the four factors on the basis of which you can choose the right method of communication.

Solu. Four factors to consider when choosing the right method of communication include the nature of the message, the urgency of communication, the recipient's preferences, and the complexity of the information. For instance, face-to-face or video communication may be preferable for delivering sensitive or complex messages that require immediate feedback or clarification. In contrast, email or instant messaging may be suitable for less urgent communications or when documenting information for future reference. Understanding the context and needs of the audience is essential for selecting the most appropriate communication method to effectively convey the message and maintain positive relationships.

Ques 11.

Solu. Machine Learning (ML) relies on algorithms to learn patterns from data, while Deep Learning (DL) leverages neural networks to automatically learn hierarchical representations from raw data.

Ques 12.

Solu. Script-bots operate based on predefined scripts, providing fixed responses, whereas Smart-bots employ AI and NLP to understand context and offer adaptive responses.

Ques 13.

Solu. Evaluating an AI model involves assessing its performance metrics such as accuracy and precision. Overfitting occurs when a model fits training data too closely, failing to generalize well to new data.

Ques 14.

Solu. For predicting disease outbreaks and resource allocation in healthcare, supervised learning is recommended. This approach relies on labeled data (e.g., historical medical records) to train models to make accurate predictions based on known patterns.

Ques 15.

Solu. Data is the foundation of AI applications, providing the information needed to train algorithms and make predictions. Two sources of online data collection include web scraping (extracting data from websites) and API (Application Programming Interface) data retrieval.

Ques 16.

Solu. Grayscale images use shades of gray to represent intensity, with each pixel having a single value indicating brightness. RGB images, on the other hand, use a combination of red, green, and blue channels to represent colors, with each pixel having three values representing the intensity of each channel.

Ques 17.

Solu. Neural networks are a type of machine learning algorithm inspired by the structure of the human brain. They consist of interconnected nodes organized into layers. The input layer receives data, which is passed through hidden layers where computations occur, and finally, the output layer produces the network's prediction. Layers include the input layer, hidden layers where data is processed, and the output layer providing the final prediction.

Ques 18.

Solu. Examples of AI applications include virtual assistants like Siri and Alexa, recommendation systems in streaming platforms, autonomous vehicles such as self-driving cars, and facial recognition technology used in security systems and social media platforms.

Ques 19.

Solu. Step 1: Tokenization - Break each document into individual words.

Document 1: [ML, and, DL, are, part, of, AI]

Document 2: [DL, is, a, subset, of, ML]

Step 2: Vocabulary Building - Create a unique set of words from all documents.

Vocabulary: [ML, and, DL, are, part, of, AI, is, a, subset]

Step 3: Count Vectorization - Count the frequency of each word in each document.

Document Vector Table:

Word	Document 1	Document 2
ML	1	0
and	1	0
DL	1	1
are	1	0
part	1	0
of	1	1
AI	1	0
is	0	1
a	0	1
subset	0	1

Step 4: Document Vectorization - Represent each document as a vector using word frequencies.

Document 1 Vector: [1, 1, 1, 1, 1, 1, 1, 0, 0, 0]

Document 2 Vector: [0, 0, 1, 0, 0, 1, 0, 1, 1, 1]