

NAVODAYA VIDYALAYA SAMITI, LUCKNOW REGION

SUBJECT: ARTIFICIAL INTELLIGENCE (417)

CLASS XTH

I PRE-BOARD (SESSION 2025-26)

Max. Time Allowed: 02:00 hrs.

Max. Marks: 50

SECTION – A (OBJECTIVE TYPE QUESTIONS)

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

4 × 1 = 4

(i) Avika travelled to Sweden from India to pursue her higher education. But she doesn't know how to speak Swedish (language of Sweden). Because of this, she was unable to find a part time job. This is an example of:

- (a) Interpersonal barrier (b) Physical barrier (c) Organisational barrier (d) Linguistic barrier

(ii) Which type of non-verbal communication is shown by actions like raising a hand to greet or pointing a finger at someone?

- (a) Facial Expression (b) Posture (c) Gesture (d) Eye Contact

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

- (a) Hard working (b) Resistance to change (c) Lazy (d) Less-confident

(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 (b) Operating System (c) Office Software (d) Designing Software

(v) What is included in self-management skills?

- (a) Time management (b) Blaming others (c) Laziness (d) Ignoring work

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

Reason (R): Organic farming technique prioritise environment friendly and sustainable practices such as using natural fertilisers, 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.

2. Answer any 5 out of given 6 questions:

5 × 1 = 5

(i) Which AI application involves analysing large sets of data to extract meaningful insights for decision-making?

- (a) Computer Vision (b) Robotics (c) Natural Language Processing (NLP) (d) Data Science

(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 (b) Virtual Assistant (c) Sentiment Analysis (d) Automatic Summarisation

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

- (a) Share (b) Shared (c) Shares (d) Shar

(iv) 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.

(v) State **True** or **False**: In natural language, it is important to understand that a word can have multiple meanings and the meanings fit into the statement according to the context of it.

(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
- (b) Website
- (c) Excel
- (d) Spreadsheet

3. Answer any 5 out of given 6 questions:

5 × 1 = 5

(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

(ii) In the sentence "She reads the book", which of the following is a stop-word that should be removed during text normalisation?

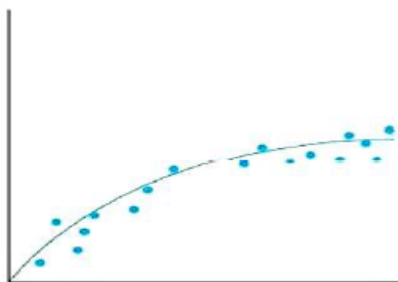
- (a) She
- (b) reads
- (c) the
- (d) book

(iii) Identify the application of Computer Vision from the given picture:



- (a) Facial Recognition
- (b) CV in Retail
- (c) Medical Imaging
- (d) Face Filters

(iv) The following diagram indicates :



- (a) Classification
- (b) Regression
- (c) Reinforcement learning
- (d) Clustering

(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.

(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

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

5 × 1 = 5

(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.

(ii) Sentiment analysis of customer reviews on various online stores is an example of _____.

- (a) Machine Learning
- (b) Computer Vision
- (c) Natural Language Processing
- (d) Speech Recognition

(iii) Which type of bot is easy to create, works based on pre-written instructions, is mostly free, easy to integrate with messaging platforms, requires little or no language processing skills, and has limited functionality?

- a) Script Bot
- b) Smart Bot
- c) Cleaning Bot
- d) Talbot

(iv) In the context of NLP, which of the following words represents a stem resulting from stemming for “Studies”?

- (a) Study
- (b) Stud
- (c) Studi
- (d) Studied

(v) Which of the following statements is true about AI Bias?

- (a) It is always negative.
- (b) It leads to overfitting of training data.
- (c) It can result in unfair and discriminatory outcomes.
- (d) A machine can have biases of its own.

(vi) Count and write the number of tokens in the sentence:

Words with adequate occurrence in a corpus are considered frequent and often reflect the main subject of the document.

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

5 × 1 = 5

(i) Whenever we want an AI project to be able to predict an output, we need to _____.

- (a) first test it using the data.
- (b) first train it using the data.
- (c) Both (a) and (b)
- (d) Neither (a) nor (b)

(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
- (b) Learning Capability
- (c) Artificial Intelligence
- (d) Cognitive Processing

(iii) A corpus contains 4 documents in which the words such as ‘an, is, the’ were appearing frequently. Identify the term that is used for such words.

- (a) Stop word
- (b) Rare word
- (c) Missing word
- (d) Removable word

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

- (a) NLP
- (b) Computer Vision
- (c) Data Science
- (d) Blockchain Technology

(v) Which condition of evaluation does the following diagram indicate?

Prediction : No

Reality : Yes

- (a) False Positive
- (b) False Negative
- (c) True Positive
- (d) True Negative

(vi) With respect to evaluation, for which of the following does the prediction and reality match ?

- (a) True positive and False positive
- (b) True positive and True negative
- (c) False positive and False negative
- (d) True positive and False negative

SECTION – B (SUBJECTIVE TYPE QUESTIONS)

Answer any 3 out of the given 5 questions on Employability Skills. (20–30 words) $3 \times 2 = 6$

6. Give any two examples of how individual choices and behaviours can contribute in achieving sustainable development.
7. List any two good qualities of a successful entrepreneur.
8. How does mediation help in managing stress? Discuss briefly.
9. Mention any two measures that individuals or organisations can take to protect their data from theft and viruses.
10. What is organic farming? Mention any two benefits of practising organic farming.

Answer any 4 out of given 6 questions in 20–30 words each. $4 \times 2 = 8$

11. Differentiate between Machine Learning (ML) and Deep Learning (DL).
12. What are the primary differences between Script-bots and Smart-bots?
13. What do you mean by Evaluation of an AI model? Also explain the concept of overfitting with respect to AI model Evaluation.
14. For a healthcare organisation's objective of predicting disease outbreaks and efficiently allocating resources through the analysis of medical records, would you recommend using supervised learning or unsupervised learning as the preferred machine learning approach? Explain your choice briefly.
15. What role does data play in AI based applications? Name any two sources of online data collection for building any AI based application.
16. Differentiate between grayscale and RGB images.

Answer any 3 out of given 5 questions in 50–80 words each. $3 \times 4 = 12$

17. What are Neural Networks? Briefly explain all the layers of a neural network.
18. Give any four examples of applications of AI that we see around us.
19. Consider the following two documents:

Document 1: ML and DL are part of AI.

Document 2: DL is a subset of ML.

Implement all four steps of the Bag of Words (BoW) model to create a document vector table. Depict the outcome of each step.

20. Consider the following graphs (Figure 1 and Figure 2) that demonstrate the two types of Supervised Learning Models of Artificial Intelligence. Identify and explain each model giving suitable examples of each.

(Figure 1 and Figure 2 – simple graphs included)

21. A binary classification model has been developed to classify news articles as either “Fake News” or “Real News”. The model was tested on a dataset of 500 news articles, and the resulting confusion matrix is as follows:

Confusion Matrix	Reality	
	Yes	No
Predicted Yes	45	15
Predicted No	20	420

- (A) How many total cases are True Negative in the above scenario?
- (B) Calculate Precision, Recall and F1-Score.