CBSE CLASS X

Artificial Intelligence (417)

QUESTION PAPER

From previous CBSE Board Exam questions

Code: SIAL4J **Questions: 43** **Maximum Marks: 68** **Generated: 2026-06-21 02:53**

SELECTIONS USED

Source	Previous-year board
Subject	Artificial Intelligence
Lessons	Evaluating Models
Year	2022-2026
Questions selected	43

Composition — Types: 23 MCQ · 7 Short · 6 Case-based · 4 fill_in_blank · 2 Very short · 1 true_false

Q1. § Unit Overview **[2]**

What is the purpose of Evaluation stage of AI project cycle? Discuss briefly.

Previously asked in: 2022 104 Q14

◆ **Revisiting AI Project Cycle & Ethical Frameworks for AI** 1.1 AI Project Cycle 3.1 Importance of Model Evaluation

Q2. § Test Yourself § Case study-based questions **[1]**

In a medical screening test for a specific disease, which scenario represents a True Negative?

(A) A person without the disease tests positive for the disease.
(B) A person with the disease tests positive for the disease.
(C) A person with the disease tests negative for the disease.
(D) A person without the disease tests negative for the disease.

Previously asked in: 2025 104/S Q5 (v)

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q3. § Assertion and reasoning-based questions **[2]**

Define Confusion Matrix.

Previously asked in: 2023 104 Q14

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q4. § 3.1: Importance of Model Evaluation § 3.3: Accuracy and Error § Assertion and reasoning-based questions **[1]**

_____ 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

Previously asked in: 2024 104 Q3 (i)

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q5. § Case study-based questions **[1]**

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.

Previously asked in: 2024 104 Q3 (v)

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q6. § Assertion and reasoning-based questions **[1]**

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.

Previously asked in: 2024 104 Q4 (i)

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q7. § Assertion and reasoning-based questions **[1]**

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.

Previously asked in: 2024 104 Q5 (iii)

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q8. § 3.4: Evaluation metrics for Classification § Assertion and reasoning-based questions § Case study-based questions **[1]**

In a fire alarm system, if the model predicts "Fire Present" when there is actually no fire, this is classified as :

(A) True Positive (TP)
(B) True Negative (TN)
(C) False Positive (FP)
(D) False Negative (FN)

Previously asked in: 2026 104 Q4 (i)

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q9. § Assertion and reasoning-based questions **[1]**

Precision is defined as :

(A) The ratio of correctly predicted positive observations to total observations.
(B) The ratio of correctly predicted positive observations to total predicted positive observations.
(C) The ratio of correctly predicted negative observations to total observations.
(D) The harmonic mean of true positives and true negatives.

Previously asked in: 2026 104 Q4 (v)

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q10. § 3.1: Importance of Model Evaluation § Assertion and reasoning-based questions **[1]**

It is one of the parameters for evaluating a model's performance and is defined as the percentage of true positive cases versus all the cases where the prediction is true. Which of the following evaluation parameter is this ?

(A) Precision
(B) Recall
(C) F1 Score
(D) Accuracy

Previously asked in: 2024 104 Q4 (iii)

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q11. § Introduction § 3.1: Importance of Model Evaluation **[1]**

With reference to evaluation process of understanding the reliability of any AI model, define the term True Positive.

Previously asked in: 2022 104 Q11

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q12. § Unit-3: Evaluating Models – Lesson Overview § Case study-based questions **[1]**

What is F1 score?

Previously asked in: 2022 104 Q12

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q13. § Unit-3: Evaluating Models – Lesson Overview **[4]**

> Traffic Jams have become a common part of our lives now-a-days. Living in an urban area means you have to face traffic each and every time you get out on the road. Mostly, school students opt for buses to go to school. Many times the bus gets late due to such jams and students are not able to reach their school on time. Thus, an AI model is created to predict explicitly if there would be a traffic jam on their way to school or not. The confusion matrix for the same is

Explain the process of calculating F1 score for the given problem.

Previously asked in: 2022 104 Q21

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q14. § 3.3: Accuracy and Error § Assertion and reasoning-based questions **[1]**

Which of the following is defined as the measure of balance between precision and recall?

(a) Accuracy
(b) F1 Score
(c) Reliability
(d) Punctuality

Previously asked in: 2023 104 Q2 (vi)

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q15. § Assertion and reasoning-based questions § Case study-based questions **[1]**

While evaluating a model's performance, recall parameter considers _____.
(i) False positive
(ii) True positive
(iii) False negative
(iv) True negative
Choose the correct option:

(a) only (i)
(b) (ii) and (iii)
(c) (iii) and (iv)
(d) (i) and (iv)

Previously asked in: 2023 104 Q3 (v)

◆ **Evaluating Models** 3.4 Evaluation Metrics for Classification

Q16. § 3.3: Accuracy and Error § Reflection Time **[1]**

When a model is evaluated on the training data it always predicts correctly. This is known as _____.

Previously asked in: 2025 104/S Q4 (iii)

◆ **Evaluating Models** 3.2 Splitting the Training Set Data for Evaluation

Q17. § Unit-3: Evaluating Models – Lesson Overview § 3.3: Accuracy and Error § Reflection Time **[1]**

Statement 1 : Overfitting occurs when a model memorizes the training data rather than learning patterns.
Statement 2 : Using the same data for training and evaluation helps the model give accurate results.

(A) Both statements are correct.
(B) Both statements are incorrect.
(C) Statement 1 is correct but statement 2 is incorrect.
(D) Statement 1 is incorrect but statement 2 is correct.

Previously asked in: 2026 104 Q2 (iv)

◆ **Evaluating Models** 3.1 Importance of Model Evaluation 3.2 Splitting the Training Set Data for Evaluation

Q18. § Introduction § 3.1: Importance of Model Evaluation **[1]**

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.

Previously asked in: 2024 104 Q4 (vi)

◆ **Evaluating Models** 3.1 Importance of Model Evaluation

Q19. § 3.2: Splitting the training set data for Evaluation **[1]**

In supervised learning, what is the purpose of the testing dataset ?

(A) To train the model.
(B) To evaluate the model's accuracy.
(C) To create new features.
(D) To label the data.

Previously asked in: 2026 104 Q3 (vi)

◆ **Evaluating Models** 3.1 Importance of Model Evaluation 3.2 Splitting the Training Set Data for Evaluation

Q20. § 3.1: Importance of Model Evaluation **[2]**

What do you mean by Evaluation of an AI model ? Also explain the concept of overfitting with respect to AI model Evaluation.

Previously asked in: 2024 104 Q13

◆ **Evaluating Models** 3.1 Importance of Model Evaluation 3.2 Splitting the Training Set Data for Evaluation

Q21. § 3.2: Splitting the training set data for Evaluation **[2]**

Explain Train-test split technique with respect to machine learning algorithm.

Previously asked in: 2026 104 Q15

◆ **Evaluating Models** 3.1 Importance of Model Evaluation 3.2 Splitting the Training Set Data for Evaluation

Q22. § 3.3: Accuracy and Error § Reflection Time § Assertion and reasoning-based questions **[1]**

Statement 1 : Overfitting is not recommended for evaluation of a model.
Statement 2 : This is because the model will simply remember the whole training set, and will therefore always predict the correct label for any point in the training set.
(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 2 is correct but Statement 1 is incorrect.

(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 2 is correct but Statement 1 is incorrect.

Previously asked in: 2024 104 Q4 (ii)

◆ **Evaluating Models** 3.1 Importance of Model Evaluation 3.2 Splitting the Training Set Data for Evaluation

Q23. § Unit-3: Evaluating Models – Lesson Overview § Introduction § Assertion and reasoning-based questions **[1]**

_____ helps to find the best model that represents our data and how well the chosen model will work in future.

Previously asked in: 2023 104 Q3 (iv)

◆ **Evaluating Models** 3.1 Importance of Model Evaluation

Q24. § Assertion and reasoning-based questions § Case study-based questions **[4]**

> Confusion Matrix for an AI model that predicts whether there is a chance of earthquake or not.

Recently the country was shaken up by a series of earthquakes which has done a huge damage to the people as well as the infrastructure. To address this issue, an AI model has been created which can predict if there is a chance of earthquake or not. The confusion matrix for the same is given. Answer the following:

(i) How many total cases are True Negative in the above scenario?

(ii) Calculate precision, recall and F1 score.

Previously asked in: 2023 104 Q21

◆ **Evaluating Models** 3.3 Accuracy and Error

Q25. § Test Yourself § Assertion and reasoning-based questions **[2]**

Draw the confusion matrix for the following data :

(a) The number of true positive = 200

(b) The number of true negative = 50

(c) The number of false positive = 35

(d) The number of false negative = 55

Previously asked in: 2025 104/S Q15

◆ **Evaluating Models** 3.3 Accuracy and Error

Q26. § Case study-based questions **[4]**

> Confusion Matrix showing the results of a sentiment analysis model tested on 500 movie reviews.

A sentiment analysis model was built to classify movie reviews as either Positive or Negative. The model was tested on a dataset of 500 reviews, resulting in the following confusion matrix :

(a) How many total cases are True Positive in the above scenario? [1]

(b) Calculate Precision, Recall and F1-Score. [3]

Previously asked in: 2025 104/S Q21

◆ **Evaluating Models** 3.3 Accuracy and Error 3.4 Evaluation Metrics for Classification

Q27. § 3.3: Accuracy and Error § Assertion and reasoning-based questions **[1]**

In the context of autonomous vehicle safety systems, which type of error would be most critical to minimize ?

(A) False Positive (detecting danger when there isn't any)
(B) False Negative (failing to detect actual danger)
(C) True Positive (detecting danger correctly)
(D) True Negative (correctly identifying that there is no danger)

Previously asked in: 2026 104 Q3 (i)

◆ **Evaluating Models** 3.3 Accuracy and Error

Q28. § 3.3: Accuracy and Error **[1]**

State True or False :
In machine learning, the error is used to see how accurately the model can predict data.

Previously asked in: 2026 104 Q5 (iv)

◆ **Evaluating Models** 3.3 Accuracy and Error

Q29. § Test Yourself § Reflection Time § Assertion and reasoning-based questions **[1]**

An AI model was tested with 1000 test samples. If True Positive (TP) = 200, True Negative (TN) = 600, False Positive (FP) = 100, False Negative (FN) = 100, how many total predictions were correct ?

(A) 300
(B) 600
(C) 800
(D) 900

Previously asked in: 2026 104 Q5 (vi)

◆ **Evaluating Models** 3.3 Accuracy and Error

Q30. § Case study-based questions **[4]**

> Confusion Matrix for a binary classification model classifying news articles as "Fake News" or "Real News", tested on 500 news articles. The confusion matrix cross-tabulates Predicted vs Reality.

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 :

(A) How many total cases are True Negative in the above scenario ? [1]

(B) Calculate Precision, Recall and F1-Score. [3]

Previously asked in: 2024 104 Q21

◆ **Evaluating Models** 3.3 Accuracy and Error 3.4 Evaluation Metrics for Classification

Q31. § Test Yourself § Assertion and reasoning-based questions § Case study-based questions **[4]**

> PQR Security Solutions has designed an AI Model to detect cyber attacks on E-Commerce websites. For this, various network activities were monitored and analyzed on one of the websites. The model was tested on a dataset of 1500 network activities. Out of these, the model correctly predicted that 1000 were cyber attacks. It also correctly identified that 250 were not cyber attacks. However, the model predicted that 200 were cyber attacks but actually they were not. Additionally, it predicted that 50 were not cyber attacks but they actually were.

Read the following paragraph and answer the questions that follow:

(A) Draw the confusion matrix based on the given scenario. [2]

(B) How many total cases are True Negative in the above scenario ? [1]

(C) Calculate Precision. [1]

Previously asked in: 2026 104 Q19

◆ **Evaluating Models** 3.3 Accuracy and Error

Q32. § Assertion and reasoning-based questions **[1]**

Which condition of evaluation does the following diagram indicate ?

(A) False Positive
(B) False Negative
(C) True Positive
(D) True Negative

Previously asked in: 2024 104 Q3 (vi)

◆ **Evaluating Models** 3.3 Accuracy and Error

Q33. § 3.1: Importance of Model Evaluation § 3.3: Accuracy and Error § Assertion and reasoning-based questions **[1]**

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

Previously asked in: 2024 104 Q5 (ii)

◆ **Evaluating Models** 3.3 Accuracy and Error

Q34. § Assertion and reasoning-based questions § Case study-based questions **[1]**

Which of the following scenarios might have a high False Negative (FN) cost ?

(A) Viral Disease Outbreak
(B) Spam
(C) Mining
(D) Image Search

Previously asked in: 2024 104 Q5 (v)

◆ **Evaluating Models** 3.3 Accuracy and Error

Q35. § Introduction § 3.3: Accuracy and Error § Reflection Time **[2]**

With reference to evaluation stage of AI project cycle, explain the term Accuracy. Also give the formula to calculate it.

Previously asked in: 2022 104 Q17

◆ **Evaluating Models** 3.1 Importance of Model Evaluation 3.3 Accuracy and Error

Q36. § Case study-based questions **[2]**

Suppose you are developing an AI model to detect fraudulent financial transaction risk. Describe False Positives and False Negatives in this context.

Previously asked in: 2024 104 Q16

◆ **Evaluating Models** 3.5 Ethical Concerns Around Model Evaluation False Positives and False Negatives in Model Evaluation

Q37. § Test Yourself § Assertion and reasoning-based questions § Case study-based questions **[4]**

> Reality vs Prediction Confusion Matrix:
> - Prediction Yes / Reality Yes: 110 (True Positive)
> - Prediction Yes / Reality No: 60 (False Positive)
> - Prediction No / Reality Yes: 50 (False Negative)
> - Prediction No / Reality No: 410 (True Negative)
> Total: 630 tests

An AI model has been developed to test specimens of blood/urine/cough etc. to diagnose ailments (diabetes/liver infection etc.). The model was tested on a data-set of about 630 tests and the resulting confusion matrix is as follows :

(A) How many total cases are True Negative in the above scenario ? [1]

(B) Calculate Precision, Recall and F1 Score. [3]

Previously asked in: 2024 104 Q21

◆ **Evaluating Models** 3.3 Accuracy and Error 3.4 Evaluation Metrics for Classification

Q38. § Assertion and reasoning-based questions **[1]**

Two conditions when prediction matches with the reality are true positive and _____.

Previously asked in: 2023 104 Q4 (ii)

◆ **Evaluating Models** 3.3 Accuracy and Error

Q39. § 3.3: Accuracy and Error § Assertion and reasoning-based questions **[1]**

_____ is defined as the percentage of correct predictions out of all the observations.

(A) Precision
(B) Accuracy
(C) Recall
(D) F1

Previously asked in: 2025 104/S Q3 (ii)

◆ **Evaluating Models** 3.3 Accuracy and Error

Q40. § 3.3: Accuracy and Error § 3.4: Evaluation metrics for Classification § Assertion and reasoning-based questions **[1]**

When the prediction matches the reality, the condition is termed as _____.

Previously asked in: 2023 104 Q5 (ii)

◆ **Evaluating Models** True Positive / Correct Prediction (Prediction matches Reality)

Q41. § Assertion and reasoning-based questions § Case study-based questions **[1]**

In a quality control system for manufacturing, which scenario represents a false negative?

(A) When a defective product is correctly identified as defective.
(B) When a non-defective product is inaccurately identified as defective.
(C) When a non-defective product is correctly identified as non-defective.
(D) When a defective product is mistakenly identified as non-defective.

Previously asked in: 2025 104/S Q3 (v)

◆ **Evaluating Models** 3.3 Accuracy and Error

Q42. § Assertion and reasoning-based questions **[1]**

Which of the following talks about how true the predictions are by any model?

(a) Accuracy
(b) Reliability
(c) Recall
(d) F1 score

Previously asked in: 2023 104 Q5 (vi)

◆ **Evaluating Models** 3.3 Accuracy and Error

Q43. § Assertion and reasoning-based questions **[1]**

Which of the following is not true about Confusion Matrix?

(A) It allows us to understand prediction results.
(B) It is a Model Training Matrix.
(C) It helps in evaluation of machine learning models.
(D) It is used to record comparison between prediction and reality.

Previously asked in: 2025 104/S Q4 (v)

◆ **Evaluating Models** 3.3 Accuracy and Error

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