(3 Hours)   **Total Marks: 80**

N. B. 1) Question No. **1** is **compulsory**.
       2) Answer any **3** questions from the remaining **5** questions.
       3) Assume suitable data wherever necessary.

Q1   Solve **any Four**   **20**
   (a)   Give any two application examples of Artificial Intelligence.
   (b)   Explain underfitting and overfitting of data in Machine Learning.
   (c)   Explain the concept of Decision tree algorithm.
   (d)   Explain the trade-off between Precision and recall.
   (e)   How do you handle missing or corrupted data in a dataset?

Q2   (a) Define Machine Learning (ML) and list its characteristics. Compare   **10**
         any four ML algorithms with advantages, limitations, issues.

   (b) How does ID3 algorithm helps in understanding in prediction rules   **10**
       created from the training data. Justify with one proper example and
       draw the diagram too.

Q3   (a) Define SVM. Differentiate between Hard Margin SVM and Soft   **10**
         Margin SVM. What is the "kernel"? How is it useful in SVM.

   (b) What is clustering? Explain k-means clustering with example.   **10**

Q4   (a) Explain the different types of variables in confusion matrix in detail   **10**
         with example.

   (b) What is normalization? Explain different categories of Normalization.   **10**

Q5   (a) Explain CNN with diagram.   **10**

   (b) Explain mean, variance, covariance, standard deviation and random   **10**
       variable with example.

Q6   (a) Write short note on Feature Engineering with detailed example along   **10**
         with its significance.

   (b) Write short note on Data screening with detailed example along with   **10**
       its significance.

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