

UT 2 NOTES
MATHS IN AI FOR UT2

Core Mathematical Branches in Class 9 AI

- **Statistics:** Explores and analyzes data through collection, organization, and interpretation to summarize trends and draw conclusions.
 - *Applications:* Weather forecasting, sports performance prediction, and disaster management.
- **Probability:** Predicts the likelihood of an event occurring, ranging from 0 (impossible) to 1 (certain).
 - *Applications:* Estimating traffic, assessing disease outbreaks, and game outcomes.
- **Linear Algebra:** Uses vectors and matrices to represent and structure multi-dimensional data like images, audio, and unknown variables.
 - *Applications:* Processing digital photos, videos, and solving equations.
- **Calculus:** Breaks complex structures down to optimize functions and train models over time.

Types of Mathematical Sequences in AI

Math Sequence Type	Mathematical Rule	Real-World AI Application
Arithmetic Progression (AP)	Numbers increase or decrease by a constant added value (e.g., 2, 5, 8, 11... adding 3).	Predictive AI: Used in linear regression to predict future data trends, like estimating future sales or traffic growth.
Geometric Progression (GP)	Numbers increase or decrease by a constant multiplied value (e.g., 2, 4, 8, 16... multiplying by 2).	Deep Learning: Simulates how data scales up rapidly in neural networks, or how computer viruses/viral trends spread exponentially.
Fibonacci Sequence	Each number is the sum of the two preceding ones (e.g., 0, 1, 1, 2, 3, 5, 8, 13...).	Optimization Algorithms: Used in AI search algorithms (like Fibonacci Search) to efficiently find data in sorted arrays, and in computer vision to recognize natural shapes.

**Consecutive
Odd / Even**

Numbers skip by 2, starting from an odd or even base (e.g., 1, 3, 5 or 2, 4, 6).

Data Classification: Used in data preprocessing algorithms to split data into binary classes, or to filter specific patterns out of noise.

Applications of Probability

1. Disaster Management: Probability helps estimate the chances of natural disasters such as floods, earthquakes, and cyclones.
2. Disease Prediction: Probability helps predict the likelihood of disease outbreaks and the spread of infections.
3. Sports: Probability helps estimate the chances of a player or team winning a match.
4. Weather Forecasting: Probability helps predict the chances of rain, storms, and other weather conditions.
5. Traffic Estimation: Probability helps estimate the likelihood of traffic jams and road accidents.
6. Finance: Probability helps assess financial risks, predict market trends, and make investment decisions.

Applications of Statistics

1. Disaster Management: Statistics helps predict and assess natural disasters such as floods, earthquakes, and cyclones.
2. Disease Prediction: Statistics helps track diseases, predict outbreaks, and plan healthcare services.
3. Sports: Statistics is used to analyse players' performance, scores, and team records.
4. Weather Forecasting: Statistics helps analyse weather data to predict rainfall, temperature, and storms.

5. Traffic Estimation: Statistics helps estimate traffic flow, identify busy roads, and reduce traffic congestion.

6. Finance: Statistics helps analyse income, expenses, investments, and market trends to make better financial decisions.

Exercise of page no 140 ABE parts(for Fill ups ,Case Studies Etc)

Unit -3 Maths for AI
MM 20

Marking scheme

Que Ans	3*3	9 Marks
Case Studies	1*3	3 Marks
MCQ,Fill ups and True False	1*8	8 Marks