



May 1, 2026

unit-1-matrices — Overview

Unit 1 — Table of Contents

Syllabus Coverage

- 1.1 What is a Matrix? Notation and Order
- 1.2 Types of Matrices
- 1.3 Matrix Operations (Addition, Subtraction, Scalar Multiplication)
- 1.4 Matrix Multiplication
- 1.5 Transpose of a Matrix
- 1.6 Determinant of a Matrix
- 1.7 Singular and Non-Singular Matrices
- 1.8 Adjoint of a Matrix
- 1.9 Inverse of a Matrix
- 1.10 Cayley–Hamilton Theorem
- 1.11 System of Linear Equations (Matrix Method)
- 1.12 GTU PYQ Practice (All Years)

Weightage: ≈ 16 marks (23%) | Hours: 10–11

Topic 1: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 3–4 (reference for further study)

Topic 2: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 5–6 (reference for further study)

Topic 3: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 7–8 (reference for further study)

Topic 4: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 9–11 (reference for further study)

Topic 5: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 12–13 (reference for further study)

Topic 6: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 14–15 (reference for further study)

Topic 7: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 16–17 (reference for further study)

Topic 8: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 18–20 (reference for further study)

Topic 9: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 21–22 (reference for further study)

Topic 10: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 23–24 (reference for further study)

Topic 11: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 25–26 (reference for further study)

Topic 12: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 27–29 (reference for further study)

Topic 13: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 30–31 (reference for further study)

Topic 14: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 32–33 (reference for further study)

Topic 15: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 34–35 (reference for further study)

Topic 16: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 36–38 (reference for further study)

Topic 17: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 39–40 (reference for further study)

Topic 18: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 41–42 (reference for further study)

Topic 19: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 43–44 (reference for further study)

Topic 20: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 45–47 (reference for further study)

Topic 21: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 48–49 (reference for further study)

Topic 22: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 50–51 (reference for further study)

Topic 23: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 52–53 (reference for further study)

Topic 24: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 54–56 (reference for further study)

Topic 25: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 57–58 (reference for further study)

Topic 26: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 59–60 (reference for further study)

Topic 27: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 61–62 (reference for further study)

Unit Summary & Revision

Next Steps

- Review all condensed frames above
- Compare with original full unit for deep understanding
- Practice worked examples and PYQ problems



May 1, 2026

unit-2-differentiation — Overview

Unit 2 — Table of Contents

Syllabus Coverage

- 2.1 Limits and Continuity
- 2.2 Derivative from First Principles
- 2.3 Standard Derivatives
- 2.4 Rules: Chain, Product and Quotient
- 2.5 Implicit Differentiation
- 2.6 Parametric Differentiation
- 2.7 Logarithmic Differentiation
- 2.8 Successive Differentiation (2nd Derivative)
- 2.9 Maxima and Minima
- 2.10 Velocity and Acceleration (Kinematics)
- 2.11 GTU PYQ Practice (All Years)

Weightage: ≈ 16 marks (23%) | Hours: 10–11

Topic 1: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 3–4 (reference for further study)

Topic 2: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 5–6 (reference for further study)

Topic 3: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 7–8 (reference for further study)

Topic 4: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 9–10 (reference for further study)

Topic 5: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 11–12 (reference for further study)

Topic 6: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 13–14 (reference for further study)

Topic 7: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 15–17 (reference for further study)

Topic 8: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 18–19 (reference for further study)

Topic 9: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 20–21 (reference for further study)

Topic 10: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 22–23 (reference for further study)

Topic 11: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 24–25 (reference for further study)

Topic 12: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 26–27 (reference for further study)

Topic 13: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 28–29 (reference for further study)

Topic 14: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 30–32 (reference for further study)

Topic 15: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 33–34 (reference for further study)

Topic 16: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 35–36 (reference for further study)

Topic 17: Key Concepts

Key Topics

- $f''(a) < 0 \Rightarrow$ Local Maximum at $x = a$
- $f''(a) > 0 \Rightarrow$ Local Minimum at $x = a$
- $f''(a) = 0 \Rightarrow$ Point of inflection (test further)

Key Definition

$f''(a) < 0 \Rightarrow$ Local Maximum at $x = a$

Source Coverage

Frames 37–38 (reference for further study)

Topic 18: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 39–40 (reference for further study)

Topic 19: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 41–42 (reference for further study)

Topic 20: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 43–44 (reference for further study)

Topic 21: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 45–47 (reference for further study)

Topic 22: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 48–49 (reference for further study)

Topic 23: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 50–51 (reference for further study)

Topic 24: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 52–53 (reference for further study)

Topic 25: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 54–55 (reference for further study)

Topic 26: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 56–57 (reference for further study)

Topic 27: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 58–60 (reference for further study)

Unit Summary & Revision

Next Steps

- Review all condensed frames above
- Compare with original full unit for deep understanding
- Practice worked examples and PYQ problems



May 1, 2026

unit-3-integration — Overview

Unit 3 — Table of Contents

Syllabus Coverage

- 3.1 Integration as Anti-Differentiation
- 3.2 Standard Integrals
- 3.3 Rules of Integration
- 3.4 Integration by Substitution
- 3.5 Integration by Parts
- 3.6 Integration by Partial Fractions
- 3.7 Definite Integrals and Properties
- 3.8 Area Under a Curve
- 3.9 GTU PYQ Practice (All Years)

Weightage: ≈ 14 marks (20%) | Hours: 10–11

Topic 1: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 3–4 (reference for further study)

Topic 2: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 5–6 (reference for further study)

Topic 3: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 7–8 (reference for further study)

Topic 4: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 9–10 (reference for further study)

Topic 5: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 11–12 (reference for further study)

Topic 6: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 13–14 (reference for further study)

Topic 7: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 15–17 (reference for further study)

Topic 8: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 18–19 (reference for further study)

Topic 9: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 20–21 (reference for further study)

Topic 10: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 22–23 (reference for further study)

Topic 11: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 24–25 (reference for further study)

Topic 12: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 26–27 (reference for further study)

Topic 13: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 28–29 (reference for further study)

Topic 14: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 30–32 (reference for further study)

Topic 15: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 33–34 (reference for further study)

Topic 16: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 35–36 (reference for further study)

Topic 17: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 37–38 (reference for further study)

Topic 18: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 39–40 (reference for further study)

Topic 19: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 41–42 (reference for further study)

Topic 20: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 43–44 (reference for further study)

Topic 21: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 45–47 (reference for further study)

Topic 22: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 48–49 (reference for further study)

Topic 23: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 50–51 (reference for further study)

Topic 24: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 52–53 (reference for further study)

Topic 25: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 54–55 (reference for further study)

Topic 26: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 56–57 (reference for further study)

Topic 27: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 58–60 (reference for further study)

Unit Summary & Revision

Next Steps

- Review all condensed frames above
- Compare with original full unit for deep understanding
- Practice worked examples and PYQ problems



May 1, 2026

unit-4-differential-equations — Overview

Unit 4 — Table of Contents

Syllabus Coverage

- 4.1 Introduction, Definitions
- 4.2 Order and Degree of a DE
- 4.3 Variable Separable Method
- 4.4 Substitution Method (Reducible DEs)
- 4.5 Linear Differential Equations
- 4.6 Initial Value Problems (IVP)
- 4.7 GTU PYQ Practice (All Years)

Weightage: ≈ 12 marks (17%) | Hours: 9–10

Topic 1: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 3–4 (reference for further study)

Topic 2: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 5–6 (reference for further study)

Topic 3: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 7–8 (reference for further study)

Topic 4: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 9–10 (reference for further study)

Topic 5: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 11–12 (reference for further study)

Topic 6: Key Concepts

Key Definition

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Frames 13–14 (reference for further study)

Topic 7: Key Concepts

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Frames 15–17 (reference for further study)

Topic 8: Key Concepts

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Frames 18–19 (reference for further study)

Topic 9: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 20–21 (reference for further study)

Topic 10: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 22–23 (reference for further study)

Topic 11: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 24–25 (reference for further study)

Topic 12: Key Concepts

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Frames 26–27 (reference for further study)

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Frames 28–29 (reference for further study)

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Frames 30–32 (reference for further study)

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Frames 41–42 (reference for further study)

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Frames 43–44 (reference for further study)

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Frames 48–49 (reference for further study)

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Key Definition

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Source Coverage

Frames 56–57 (reference for further study)

Topic 27: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 58–60 (reference for further study)

Unit Summary & Revision

Next Steps

- Review all condensed frames above
- Compare with original full unit for deep understanding
- Practice worked examples and PYQ problems



May 1, 2026

Syllabus Coverage

- 5.1** Introduction & Key Definitions
- 5.2** Mean: Direct Method
- 5.3** Mean: Assumed Mean & Step Deviation Methods
- 5.4** Mean Deviation
- 5.5** Standard Deviation
- 5.6** Coefficient of Variation (CV)
- 5.7** GTU PYQ Practice (All Years)

Weightage: ≈ 12 marks (17%) | Hours: 9–10

Topic 1: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 3–4 (reference for further study)

Topic 2: Key Concepts

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Frames 5–6 (reference for further study)

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Topic 14: Key Concepts

Key Definition

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Source Coverage

Frames 30–32 (reference for further study)

Topic 15: Key Concepts

Key Topics

- Lower CV $\Rightarrow$ more consistent / less variable data
- Higher CV $\Rightarrow$ more spread out data
- Used to compare variability of two different datasets

Key Definition

Lower CV $\Rightarrow$ more consistent / less variable data

Source Coverage

Frames 33–34 (reference for further study)

Topic 16: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 35–36 (reference for further study)

Topic 17: Key Concepts

Key Definition

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Source Coverage

Frames 56–57 (reference for further study)

Topic 27: Key Concepts

Key Definition

See materials for detailed content.

Source Coverage

Frames 58–60 (reference for further study)

Unit Summary & Revision

Next Steps

- Review all condensed frames above
- Compare with original full unit for deep understanding
- Practice worked examples and PYQ problems