

TEST MANTHAN — PRD MODULE 3

Feature Specification (MVP)

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Depends on: Module 1 (Confirmed), Module 2 (Confirmed)

3.1 PURPOSE OF THIS MODULE

This module defines **every feature that ships in the MVP** — and explicitly excludes everything that doesn't. Each feature has:

- A clear description of what it does
- Why it exists (which persona it serves, which pillar it supports)
- Acceptance criteria (how we know it's "done")
- Edge cases and business rules
- What is NOT included (to prevent scope creep)

If a feature is not in this document, it does not get built for MVP. No exceptions.

3.2 MVP FEATURE MAP (Overview)

The MVP consists of **7 functional areas**. Each is detailed in the sections that follow.

#	Functional Area	Priority	Pillar Served	Status
F1	User Authentication & Profile	Must Have	Foundation	To be built
F2	Test Creation Wizard	Must Have	Customization	Partially built (frontend)
F3	Question Bank & Selection Engine	Must Have	Life Sciences Focus	Database to be populated
F4	Test-Taking Interface	Must Have	Foundation	Partially built (frontend)
F5	Post-Test Analytics Dashboard	Must Have	Deep Analytics	To be built
F6	Test History & Progress Tracking	Must Have	Deep Analytics	To be built
F7	Subscription & Payment	Must Have	Foundation	To be built

NOT in MVP (explicitly deferred):

Feature	Why Deferred	Target Phase
Full Mock Test Series (bonus)	Requires manual curation; staggered release starts Month 1 post-launch	Month 1-6 post-launch
AI-powered recommendations	Requires user data to be meaningful; rule-based recommendations first	Phase 2 (Month 3-4)
Adaptive testing	Requires 10,000+ test attempts for meaningful ML	Phase 3 (Month 7+)
AI doubt solver	Separate product surface; not core to testing	Phase 3
Mobile app	Web-first, mobile-responsive covers 90% of use cases	Phase 2-3
Community/forum	Not core to testing value prop	Phase 3
Template library (shared)	Personal templates ship in MVP; shared/community templates deferred	Phase 2
Peer comparison/leaderboard	Requires critical mass of users	Phase 2
Video explanations	Content production bottleneck	Phase 2-3
Referral program	Build product-market fit first, then optimize growth loops	Phase 2

3.3 F1: USER AUTHENTICATION & PROFILE

Description

Users can create an account, log in, and maintain a basic profile that stores their exam preference and subscription status.

User Stories

- As a new user, I can sign up using my email or Google account so that I can start using Test Manthan quickly.
- As a returning user, I can log in and see my dashboard with test history and subscription status.
- As a user, I can update my target exam at any time from my profile.

Functional Requirements

Sign-Up Flow:

1. User arrives at sign-up page (from landing page CTA or direct link)
2. Two options:
 - Google OAuth (one-click sign-up) — PREFERRED, reduces friction
 - Email + Password (with email verification)
3. After authentication, user sees a single onboarding question:
 - "Which exam are you preparing for?" — Card-based selection showing all 6 exams:
 - CSIR-NET Life Sciences
 - GATE Biotechnology (BT)
 - GATE Life Sciences (XL)
 - IIT-JAM Biotechnology
 - GAT-B
 - CUET-PG
 - Option: "I'm exploring / Not sure yet" (defaults to no pre-selection)
4. User lands on Dashboard (home screen)

Login Flow:

1. Google OAuth or Email + Password
2. "Forgot Password" flow via email reset link
3. Session persistence: Stay logged in for 30 days on the same device

User Profile (Accessible from dashboard):

Field	Required?	Editable?	Purpose
Full Name	Yes (from Google or manual)	Yes	Display + communication
Email	Yes	No (identity anchor)	Auth + notifications
Phone Number	No (optional at sign-up, prompted later)	Yes	SMS/WhatsApp notifications
Target Exam	Yes (selected at onboarding)	Yes (changeable anytime)	Personalization + segmentation
College/University	No	Yes	Segmentation + campus ambassador identification
Current Year/Status	No	Yes	Persona identification (BSc/MSc/Working)
Profile Photo	No	Yes	Personalization (Google OAuth auto-fills)

Subscription Status Display:

- Current plan: Free / Pro / Elite
- If paid: billing cycle dates, next renewal date
- Quick link to upgrade/manage subscription

Edge Cases

- **User signs up with Google, then tries email with same address:** System recognizes existing account, prompts to log in via Google.
- **User changes target exam after subscribing to Pro (which locks to one exam):** If new exam requires Elite (e.g., switching from JAM to CSIR-NET), show upgrade prompt. If new exam is within Pro eligibility, allow switch.
- **User signs up but never completes onboarding question:** Default to no exam pre-selection. They pick exam in the test creation wizard.

What Is NOT Included

- Phone OTP login (deferred — adds complexity, Google + email covers most users)
- Social login via Facebook, Apple, etc.
- Multi-device session management
- Two-factor authentication

- Public user profiles
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3.4 F2: TEST CREATION WIZARD

Description

A 3-step guided wizard that lets users configure a custom test from the question bank. This is the product's signature experience — where the "Complete Customization" pillar is delivered.

User Stories

- As a student, I can create a custom test by selecting my exam, subject, topics, and difficulty so that I practice exactly what I need.
- As a free user, I can create up to 2 tests per month with basic customization so that I experience Test Manthan's value.
- As a Pro/Elite user, I can access subtopic-level granularity and all question sources so that I get precision practice.
- As a user, I can see in real-time how many questions match my current filters so that I know my test will be meaningful.
- As a returning user, I can save a test configuration as a template and re-use it later.

The 3-Step Flow

STEP 1: THE FOUNDATION

Purpose: Select exam and enter the test configuration context.

UI Elements:

- 6 exam cards in a grid (2x3 on desktop, 1-column on mobile)
- Each card shows: Exam name, brief descriptor, icon, color-coded gradient
- Card colors per original design:
 - CSIR-NET LS: Teal gradient
 - GATE-BT: Blue gradient
 - GATE-XL: Purple gradient
 - IIT-JAM BT: Green gradient
 - GAT-B: Sky blue gradient
 - CUET-PG: Orange gradient

Behavior:

- If user selected a target exam at onboarding, that card is pre-highlighted (but not auto-selected — user must click to confirm)
- Single-select: clicking one exam deselects any other
- Selected state: border glow + checkmark overlay

After exam selection, Test Mode appears:

Three mode cards displayed horizontally below the exam selection:

- **Standard** (default, pre-selected): "Fresh questions you haven't seen before"
- **Revision**: "Re-practice questions from previous tests"
- **Weakness**: "Focus on your low-accuracy topics"
- Revision and Weakness are greyed out if user has no test history (tooltip: "Take your first test to unlock")
- "Next" button activates only after an exam is selected (mode defaults to Standard)

Plan-Based Restrictions:

- Free: All 6 exams visible and selectable (free users can try any exam)
- Pro: Only the user's enrolled exam is selectable. Other exams show a lock icon + "Upgrade to Elite for all exams"
- Elite: All 6 exams selectable, switch anytime

Business Rule: When a user selects an exam, the corresponding JSON exam config is loaded. This config dictates marking scheme, question types available, and time-per-question defaults for the rest of the wizard.

What happens on "Next": Exam selection is locked for this test. User proceeds to Step 2.

STEP 2: THE PRECISION

Purpose: Select subject, topics, and (for Pro/Elite) subtopics.

Section 2A: Subject Selection

- Visual grid of subject cards (4 columns desktop, 2 columns mobile)
- Each card: Subject icon, subject name, total question count in bank for this exam+subject combination
- Single-select (one subject per test)
- Subjects shown are filtered based on exam selected in Step 1

Example subjects for CSIR-NET LS: Molecular Biology, Cell Biology, Genetics, Biochemistry, Microbiology, Immunology, Ecology, Evolution, Plant Biology, Animal Biology, Developmental Biology, Physiology, Biotechnology & Bioinformatics

(Exact subject list per exam to be defined in Module 5: Question Bank Architecture)

Section 2B: Topic Selection

- Appears after subject is selected
- Checklist format with multi-select checkboxes
- Each topic row shows: Topic name, available question count (live, based on current filters)
- "Select All" / "Clear All" toggle at top
- Minimum: At least 1 topic must be selected

Example topics for Cell Biology: Cell Structure & Organization, Cell Membrane & Transport, Cell Signaling, Cell Cycle & Division, Apoptosis & Programmed Cell Death, Cytoskeleton, Cell Junctions & ECM, Intracellular Trafficking

Section 2C: Subtopic Selection (Pro & Elite Only)

- Appears as expandable/collapsible sections under each selected topic
- Multi-select checkboxes per subtopic
- Shows available question count per subtopic
- If no subtopics are selected, all subtopics within selected topics are included (default: all)
- Free users: This section shows a locked state with message "Upgrade to Pro for subtopic-level precision"

Example subtopics for Cell Signaling: G-Protein Coupled Receptors, Receptor Tyrosine Kinases, Second Messengers (cAMP, IP3, DAG), MAPK Signaling Cascade, Wnt Signaling, Notch Signaling, Hedgehog Signaling, JAK-STAT Pathway, NF-κB Pathway, Signal Amplification & Termination

Live Counter Behavior:

- As user selects/deselects topics and subtopics, the "Available Questions" counter in the sidebar updates in real-time
- Counter queries the question bank with current filters: exam + subject + selected topics/subtopics
- This is a critical trust signal — the user must always know how deep the bank is for their selection

What happens on "Next": Subject + topic + subtopic selections are locked. User proceeds to Step 3.

STEP 3: THE CUSTOMIZATION

Purpose: Fine-tune question source, types, cognitive levels, difficulty, and test parameters.

Section 3A: Question Source

Two toggle switches:

- **Past Year Questions (PYQ):** ON by default for all plans
- **Practice Questions:** ON by default for Pro/Elite. Locked for Free with message "Upgrade to unlock 3,000+ practice questions"

User can toggle either on/off. At least one must be ON.

Section 3B: Question Types

Checkboxes (multi-select):

- MCQ (Multiple Choice — Single Correct Answer)
- MSQ (Multiple Select Questions — Multiple Correct)
- NAT (Numerical Answer Type)

Which types are available depends on the exam config loaded in Step 1. For example:

- CSIR-NET: MCQ (Part A, B, C), MSQ (Part C)
- GATE-BT: MCQ, MSQ, NAT
- IIT-JAM: MCQ, MSQ, NAT

All available types are checked by default. User can uncheck to focus on specific types.

Section 3C: Cognitive Levels

Checkboxes with info tooltips (multi-select):

- Recall (ⓘ "Remembering facts, definitions, terms")
- Conceptual (ⓘ "Understanding mechanisms, processes, relationships")
- Application (ⓘ "Applying knowledge to new scenarios, problems, experiments")
- Analytical (ⓘ "Analyzing data, evaluating hypotheses, synthesizing across topics")

All checked by default. Free users: All levels available (cognitive filtering is not a paid gate — it's pedagogically important for everyone).

Section 3D: Difficulty Distribution

A slider or segmented control with three zones:

- Easy: Default 30%
- Medium: Default 50%
- Hard: Default 20%

User can adjust the distribution. The total always sums to 100%.

Visual feedback: Color-coded bar (green/yellow/red) showing the distribution.

Business rule: Difficulty distribution is a *preference*, not a guarantee. The system attempts to match the distribution but may deviate if the question bank for the selected filters doesn't have enough questions at a given difficulty. In such cases, the sidebar shows a message: "Difficulty adjusted — not enough Hard questions for selected topics."

Section 3E: Test Parameters

Question Count:

- Free: Slider or buttons, range 5-10 (max 10)
- Pro: Range 5-20 (max 20)
- Elite: Range 5-30 (max 30)
- Default: 15 (Pro), 20 (Elite), 10 (Free)

Duration:

- Auto-calculate (default): Based on exam config's time-per-question setting × question count
- Manual override: User can set custom duration in minutes
- Display: "Estimated time: X minutes (Y min/question based on [Exam] pattern)"

Section 3F: Test Name

- Auto-generated: "[Exam] • [Subject/Topics] • Topic Test • [Date]"
 - Example: "CSIR-NET • Cell Biology • Topic Test • 15 Feb"
 - User can edit the name if they want
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LIVE PREVIEW SIDEBAR (Visible Throughout All 3 Steps)

Position: Right side on desktop (1/3 width), bottom sheet on mobile.

Always Shows:

- Test name (auto-generated, updates live)
- Available Questions indicator with color coding:
 - ● Red (< 10): "Too few questions. Broaden your filters."
 - ● Yellow (10-50): "Good for quick practice"
 - ● Green (50-200): "Great range available"
 - ● Green (200+): "Plenty of questions"
- Configuration summary (updates as user progresses through steps):
 - Exam: [selected]
 - Subject: [selected]
 - Topics: [count selected]
 - Subtopics: [count selected or "All"]
 - Question Types: [MCQ, MSQ, NAT]
 - Cognitive Levels: [selected levels]

- Difficulty: [Easy X% / Medium Y% / Hard Z%]
- Questions: [count]
- Duration: [X minutes]
- Source: [PYQ / Practice / Both]
- Status message (contextual, changes based on available questions and selections)
- "**Create Test**" button — Primary CTA, always visible. Disabled until minimum requirements met (exam + subject + at least 1 topic + at least 1 question type).
- "**Save as Template**" link (Pro/Elite only) — Saves current configuration for re-use

Test Creation — Business Rules Summary

Rule	Description
Minimum questions for test creation	Available question count must be \geq selected question count. If user requests 20 but only 12 match filters, show warning: "Only 12 questions match your filters. Create test with 12 or adjust filters."
Question selection by mode	Standard: unseen only. Revision: seen only. Weakness: from topics with <60% accuracy. All modes respect the same content filters.
Topic distribution	Questions are distributed equally across selected topics. If Topic A has 50 matching questions and Topic B has 3, Topic B gets 3 and Topic A fills the remainder.
Free tier monthly reset	Free user's 2-test count resets on the 1st of each calendar month (not rolling 30 days).
Template limit	Pro: 5 saved templates. Elite: 20 saved templates. Free: No templates.
Simultaneous test creation	Only one test can be in-progress at a time. Creating a new test while one is active prompts: "You have an unfinished test. Submit or discard it first."
Standard mode pool exhaustion	If all matching questions have been seen, "Create Test" is disabled. Message: "You've seen all matching questions. Switch to Revision mode or broaden your filters."

Edge Cases

- **Zero questions match filters:** "Create Test" button disabled. Sidebar shows red state: "No questions match your current filters. Try selecting more topics or adjusting difficulty." Do NOT allow creation of a 0-question test under any circumstance.
- **User selects only NAT questions but the topic has no NAT questions:** Available count shows 0 for NAT. Sidebar updates. System does not silently create a test with different question types.
- **User on Pro selects an exam they're not enrolled in:** Exam card shows lock icon. Clicking it shows: "This exam requires Manthan Elite (₹899/month). Upgrade to access all 6 exams."

- **User's free tests are exhausted for the month:** "Create Test" button is replaced with: "You've used your 2 free tests this month. Resets on [date]. Upgrade to Pro for unlimited tests."
 - **Browser crash during test creation:** Test creation state is auto-saved in local storage after each step. On return, prompt: "Resume your test setup?" with option to start over.
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3.5 F3: QUESTION BANK & SELECTION ENGINE

Description

The structured database of questions that powers test creation. This is not a user-facing feature per se — the user never "browses" the question bank directly. They interact with it through the Test Creation Wizard filters.

(Full question bank architecture, tagging taxonomy, and data model will be specified in Module 5. This section covers only what the MVP needs functionally.)

MVP Requirements

Minimum Question Count at Launch:

Exam	Minimum Questions	Stretch Goal
CSIR-NET LS	2,500	4,000
GATE-BT	1,500	2,500
GATE-XL	1,000	1,500
IIT-JAM BT	1,000	1,500
GAT-B	500	800
CUET-PG	500	800
Total	7,000	11,100

Every question must have:

Attribute	Required?	Example
Question text	Yes	"Which of the following is NOT a feature of G-protein coupled receptors?"
Options (for MCQ/MSQ)	Yes (MCQ/MSQ)	A, B, C, D (MCQ) or A, B, C, D, E (MSQ)
Correct answer(s)	Yes	"B" or "A, C, D" (MSQ) or "4.56" (NAT)
NAT answer range	Yes (NAT only)	Min: 4.50, Max: 4.62
Explanation	Yes	Teaching-focused explanation of why the correct answer is correct AND why wrong options are wrong
Exam tag	Yes	CSIR-NET LS
Subject tag	Yes	Cell Biology
Topic tag	Yes	Cell Signaling
Subtopic tag	Yes	G-Protein Coupled Receptors
Difficulty	Yes	Easy / Medium / Hard
Cognitive level	Yes	Recall / Conceptual / Application / Analytical
Question type	Yes	MCQ / MSQ / NAT
Source	Yes	PYQ (with year + exam) / Practice
If PYQ: Year	Yes (PYQ only)	2022
If PYQ: Exam + session	Yes (PYQ only)	CSIR-NET June 2022
Has image/diagram	Yes/No flag	Yes → image file reference
Review status	Internal	Reviewed / Pending Review / Flagged

Question Selection Engine:

When "Create Test" is clicked, the system:

1. Queries the question bank with all selected filters (exam via syllabus map, subject, topics, subtopics, question types, cognitive levels, source type, permissible scope tiers from exam config)
2. Applies **test mode filter**:
 - Standard: Excludes questions present in user's question history (unseen only)
 - Revision: Includes ONLY questions present in user's question history (seen only)

- Weakness: Includes questions from topics/subtopics where user's historical accuracy < 60%
3. Applies difficulty distribution preference (mapped from Easy/Medium/Hard slider to tier + cognitive level combinations per exam config)
 4. Distributes questions across selected topics as evenly as possible (equal per topic, with fallback logic if uneven availability)
 5. Randomly selects the requested number of questions from the filtered, distributed pool
 6. Returns the question set to the test-taking interface with ordering randomized (default)

What Is NOT Included

- User-contributed questions (all questions are team-curated)
 - Question rating/feedback system (deferred to Phase 2)
 - Question difficulty auto-calibration based on user performance (Phase 3 — requires data)
 - Public question bank browsing
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3.6 F4: TEST-TAKING INTERFACE

Description

The full-screen, distraction-free interface where the user attempts the test. Must feel exam-like in focus and seriousness, while being smoother and more modern than actual exam portals.

User Stories

- As a student, I can take my custom test in a focused, exam-like environment so that my practice simulates real conditions.
- As a student, I can navigate between questions, flag questions for review, and see my progress so that I manage my time effectively.
- As a student, I can submit my test and immediately see my results.

Interface Layout

Header Bar (Fixed, Always Visible):

- Test name (left)
- Timer — countdown from set duration (center)
- Question palette toggle button (right)
- "Submit Test" button (right, with confirmation)

Main Question Area (Center):

- Question number indicator: "Question X of Y"

- Question text (rich text — supports bold, italic, subscript, superscript, Greek symbols, chemical formulas)
- Image/diagram display (if question has one — resizable, zoomable)
- Answer area:
 - MCQ: Radio buttons (A, B, C, D) — single select
 - MSQ: Checkboxes (A, B, C, D, E) — multi-select
 - NAT: Numeric input field with decimal support
- "Clear Response" button — resets selection to unanswered
- "Flag for Review" checkbox
- Navigation: "Previous" and "Next" buttons

Question Palette (Sidebar or Modal):

- Grid view of all question numbers
- Color coding:
 - Green: Answered
 - Orange: Flagged for review
 - Red: Not visited
 - Gray: Visited but unanswered
- Click any number to jump to that question
- "Review Flagged" quick filter button
- Summary count: "Answered: X | Flagged: Y | Unanswered: Z"

Timer Behavior

- Counts down from the configured duration
- Visual warning at 5 minutes remaining (timer turns amber)
- Visual warning at 1 minute remaining (timer turns red, subtle pulse)
- At 0:00: Auto-submit the test with current answers
- Timer is visible at all times but not overly prominent (exam simulation, not anxiety generation)

Marking Scheme Application

The exam JSON config (loaded in Step 1 of test creation) dictates:

Exam	MCQ Correct	MCQ Wrong	MSQ Correct	MSQ Partial	MSQ Wrong	NAT Correct	NAT Wrong
CSIR- NET	+2 (Part A), varies Part B/C	-0.5 (Part A)	Varies by Part	No partial	-0.5 to 0	N/A	N/A
GATE- BT	+1 or +2	-1/3 or -2/3	+1 or +2	Partial credit	0	+1 or +2	0
IIT-JAM	+1 or +2	-1/3 or -2/3	+1 or +2	Partial credit	-1	+1 or +2	0

(Full marking scheme per exam to be defined in the exam JSON config – Module 5)

Critical rule: Marks are calculated using the exam config, not hardcoded. This means:

- The same question, attempted in a CSIR-NET test vs. a GATE-BT test, may carry different marks and different negative marking penalties.
- The analytics dashboard must show the score as per the correct exam's marking scheme.

Submission Flow

1. User clicks "Submit Test"
2. Confirmation modal appears:
 - Summary: "Answered: X | Unanswered: Y | Flagged: Z"
 - Warning if unanswered questions exist: "You have Y unanswered questions. Are you sure?"
 - Two buttons: "Review Questions" (goes back) and "Submit" (final)
3. On submit:
 - Answers are saved to database
 - Score is calculated using exam config marking scheme
 - User is redirected to Analytics Dashboard for this test

Edge Cases

- **Browser closes during test:** Answers are auto-saved to the server every time the user answers/changes a question (or at minimum every 60 seconds). If user returns within 24 hours, prompt: "You have an unfinished test. Resume or discard?" Resume restores their answers and remaining time.
- **Timer expires while user is on a question:** Auto-submit immediately. Whatever is answered is submitted. Clear message: "Time's up! Your test has been submitted."
- **User tries to open a new tab/window during test:** No enforcement. We are not a proctored exam. The test is for self-practice. No cheating prevention needed.

- **NAT answer precision:** Accept answers within the defined range (min-max) in the question data. Display to user: "Enter your numerical answer (round to 2 decimal places)" or as specified by exam config.
- **MSQ partial marking:** If exam config allows partial marking (e.g., GATE), calculate marks based on the specific partial credit formula defined in the config.

What Is NOT Included

- Proctoring or cheating detection
 - Section-based timing (e.g., GATE has mandatory section breaks — deferred, topic-wise tests don't need this)
 - Calculator widget (students use their own; browser calculator is fine)
 - Text highlighting or note-taking within the test
 - Question-level bookmarking beyond "Flag for Review"
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3.7 F5: POST-TEST ANALYTICS DASHBOARD

Description

The analytics dashboard shown immediately after test submission and accessible from test history. This is where the "Deep Analytics" pillar is delivered. It transforms raw test data into specific, actionable insights.

User Stories

- As a student, I can see a comprehensive breakdown of my performance after every test so that I know exactly where to focus next.
- As a free user, I can see enough analytics to understand the depth of insights available, motivating me to upgrade.
- As a Pro/Elite user, I can see topic, subtopic, cognitive level, question type, time, and difficulty analysis for every test.

Analytics Tabs

The dashboard has 5 tabs. What's visible depends on the user's plan.

TAB 1: OVERVIEW (All Plans)

Hero Metrics (Large, Prominent):

- **Score:** X/Y marks (with percentage) — calculated per exam marking scheme
- **Accuracy:** X% (correct answers / total attempted, ignoring marks)
- **Time Taken:** XX:XX minutes

- **Questions:** Attempted X of Y

Performance Bar:

- Visual horizontal bar showing: Correct (green) | Incorrect (red) | Unanswered (gray)

Quick Breakdown Cards (3-4 cards):

- Strongest Topic: "[Topic Name] — X% accuracy"
- Weakest Topic: "[Topic Name] — X% accuracy"
- Toughest Difficulty: "Your Hard question accuracy was X%"
- Time Insight: "Avg X.X min/question"

One Key Recommendation:

- A single, specific actionable recommendation based on the test.
- Example: "Focus on Cell Signaling — accuracy dropped to 40%. Revise second messenger pathways before your next test."
- This recommendation appears for ALL plans, including Free.

Free User Upsell (Subtle):

- Below the overview, a muted section: "Want deeper insights? Topic breakdown, cognitive analysis, time management — all available with Pro."
 - Not aggressive. Not a popup. Just a visible invitation.
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TAB 2: TOPIC PERFORMANCE (All Plans — Depth Varies)

Free Users See:

- Bar chart: Topics vs. Accuracy (%)
- Simple table: Topic name | Questions attempted | Correct | Accuracy %
- No subtopic breakdown

Pro/Elite Users See:

- Everything Free users see, PLUS:
- **Subtopic drill-down:** Click any topic to expand subtopic performance
 - Subtopic name | Questions | Correct | Accuracy % | Avg Time | Difficulty Mix
- **Topic trend** (if user has taken previous tests on same topics): Line showing accuracy change over time
- **Recommended action per topic:**
 - Green (>80%): "Strong — maintain with occasional review"

- Yellow (50-80%): "Needs work — create a focused test on this topic"
 - Red (<50%): "Critical weakness — prioritize revision immediately"
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TAB 3: QUESTION ANALYSIS (All Plans — Depth Varies)

All Users See:

- Question-by-question breakdown table:
 - Q# | Status (/ /) | Your Answer | Correct Answer | Time Taken
- Click any question to expand:
 - Full question text
 - All options with correct one highlighted
 - Detailed explanation
 - Question metadata: Difficulty, Cognitive Level, Topic, Subtopic
 - If PYQ: Source exam and year

Pro/Elite Users Additionally See:

- Filter controls: Filter by Correct/Incorrect/Unanswered, by Difficulty, by Question Type, by Cognitive Level

Note on error categorization: Deferred from MVP. Students will NOT self-tag their errors (concept gap / careless error / time pressure) at launch. This simplifies the review flow. In Phase 2, we may introduce self-tagging or AI-based error classification once we have sufficient user data to validate its usefulness.

TAB 4: TIME MANAGEMENT (Pro/Elite Only)

Charts:

- **Time distribution pie chart:** Time spent per topic
- **Time vs. Accuracy scatter plot:** Each question as a dot — X axis: time taken, Y axis: correct/incorrect. Reveals if rushed questions are more often wrong.
- **Average time by question type:** Bar chart — MCQ avg | MSQ avg | NAT avg
- **Average time by difficulty:** Bar chart — Easy avg | Medium avg | Hard avg

Insights (Text-Based):

- "You spent an average of X.X minutes on Analytical questions vs. Y.Y minutes on Recall questions"
- "3 of your incorrect answers were in questions you spent less than 30 seconds on — consider slowing down"

- "Your MSQ questions took 2x longer than MCQs — this is normal but watch for time allocation in the actual exam"

Free users: See a preview message: "Unlock Time Management analysis with Pro to understand your pacing."

TAB 5: RECOMMENDATIONS (Pro/Elite Only — Rule-Based for MVP)

For MVP, recommendations are rule-based, not AI-generated. Rules:

Condition	Recommendation
Topic accuracy < 40%	"Critical weakness in [Topic]. Revise core concepts before testing again."
Topic accuracy 40-60%	"Moderate weakness in [Topic]. Create a focused test at Medium difficulty."
Cognitive level accuracy gap > 20% between Recall and Application	"Your Recall is strong (X%) but Application is weak (Y%). Practice more application-based questions."
MSQ accuracy < 50% while MCQ > 70%	"You struggle with multi-select questions. Practice identifying partial-correct options."
NAT accuracy < 40%	"Numerical answer questions need attention. Focus on calculation practice and unit conversions."
Average time/question > 1.5x exam standard	"You're spending too long per question. Practice with tighter time limits."
> 30% questions unanswered	"You left many questions unanswered. Time management may be the issue — or expand your topic coverage."
Hard accuracy > Medium accuracy	"Interesting — you perform better on Hard questions than Medium. Check if Medium questions have different subtopic gaps."

Display: 3-5 most relevant recommendations shown as cards, each with:

- Observation (what the data shows)
- Recommendation (what to do)
- Quick action: "Create a test for this" button that pre-fills the test creation wizard with the recommended filters

Free users: See Tab 5 title but content is blurred/locked: "Unlock personalized recommendations with Pro."

Analytics — Data Persistence

- All test results and analytics are stored permanently (or for the duration of the user's account)
 - Analytics can be re-reviewed at any time from Test History
 - Data is used to power progress tracking (F6) and future AI features
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3.8 F6: TEST HISTORY & PROGRESS TRACKING

Description

A chronological record of all tests taken, with the ability to revisit analytics and track improvement over time.

User Stories

- As a student, I can see all my past tests in one place so that I can review any test's analytics.
- As a student, I can see my overall improvement across topics over time so that I know my preparation is working.
- As a student, I can save and re-use test configurations so that I can repeat similar tests efficiently.

Test History View

List/card view of all past tests, most recent first:

Each entry shows:

- Test name
- Date and time taken
- Score (marks) and accuracy (%)
- Topics covered (as tags)
- Duration (time taken vs. allotted)
- Quick visual: Green/Yellow/Red dot indicating overall performance
- "View Analytics" button → opens full analytics dashboard for that test
- "Re-take Similar" button → opens test creation wizard pre-filled with same configuration

Filters:

- By exam
- By subject
- By date range
- By score range

Search: Search by test name or topic

Progress Tracking Dashboard (Pro/Elite Only)

Available after 3+ tests:

Topic Mastery Grid:

- Table showing every topic the user has been tested on
- Columns: Topic | Tests Taken | Current Accuracy | Trend ($\uparrow\downarrow\rightarrow$) | Last Tested
- Color-coded: Green (>80%) | Yellow (50-80%) | Red (<50%)
- Sort by: Weakest first (default), Most tested, Least recently tested

Accuracy Trend Chart:

- Line graph showing overall accuracy over time (X axis: date, Y axis: accuracy %)
- Overlay option: Filter by specific topic to see topic-specific trend

Test Volume Chart:

- Bar graph: Tests taken per week/month
- Useful for tracking consistency of practice

Cognitive Level Progress:

- Radar/spider chart showing accuracy across all 4 cognitive levels
- Compare: "First month" vs. "Last month" if enough data exists

Free Users: See test history list only. Progress tracking is locked with upgrade prompt.

Saved Templates (Pro/Elite)

- User can save test configurations from the creation wizard
- Template includes: Exam, subject, topics, subtopics, question types, cognitive levels, difficulty distribution, question count, duration
- Template does NOT include specific questions (a new random selection happens each time)
- Templates are listed in a separate tab within Test History
- "Use Template" button → opens test creation wizard pre-filled, user can modify before creating
- Limits: Pro = 5 templates, Elite = 20 templates

3.9 F7: SUBSCRIPTION & PAYMENT

Description

The subscription management system that handles plan selection, payment processing, upgrades, downgrades,

and cancellation.

Plans (Confirmed from Module 1)

Feature	Free	Manthan Pro (₹499/mo)	Manthan Elite (₹899/mo)
Tests per month	2	Unlimited	Unlimited
Questions per test	10 max	20 max	30 max
Exam access	Any (for testing)	1 exam (JAM/CUET/GAT-B)	All 6 exams
Subject + Topic selection	✓	✓	✓
Subtopic selection	✗	✓	✓
Question source	PYQ only	PYQ + Practice	PYQ + Practice
Cognitive levels	All	All	All
Analytics — Overview	✓	✓	✓
Analytics — Topic breakdown	Basic	Full + Subtopic	Full + Subtopic
Analytics — Question review	Basic	Full + Filters + Error tags	Full + Filters + Error tags
Analytics — Time Management	✗	✓	✓
Analytics — Recommendations	✗	✓	✓
Progress tracking	✗	✓	✓
Saved templates	✗	5	20
Full Mock Bonus	✗	✓ (exam-specific)	✓ (all exams)
Group Mentorship (Monthly)	✗	✗	✓
Priority Support	✗	✗	✓

Payment Flow

Payment Gateway: Razorpay (supports UPI, cards, net banking, wallets — dominant in Indian student market)

Upgrade Flow:

1. User clicks "Upgrade" from any upgrade prompt or from pricing page
2. Plan selection: Pro or Elite (with feature comparison)
3. If Pro: Select which exam to enroll (JAM BT / CUET-PG / GAT-B)

4. Payment page: Razorpay checkout (UPI preferred, cards, net banking)
5. On successful payment:
 - Plan activates immediately
 - Dashboard reflects new plan
 - Confirmation email sent
 - If upgrading mid-cycle (Free → Paid): Immediate access, billing cycle starts today
 - If upgrading tier (Pro → Elite): Prorated billing or immediate upgrade with next cycle adjusted

Downgrade Flow:

- User requests downgrade from Settings → Subscription
- Downgrade takes effect at end of current billing cycle
- Access to current plan continues until cycle ends
- Clear message: "Your Elite plan remains active until [date]. After that, you'll be on [Pro/Free]."

Cancellation Flow:

- One-click cancel from Settings → Subscription
- Access continues until end of billing period
- Confirmation: "Your plan will remain active until [date]. After that, your account reverts to Free."
- Optional: "Tell us why you're leaving" (dropdown: Too expensive / Not enough questions / Not useful / Switching to another platform / Exam complete / Other)
- No hard sell. No guilt trip. Clean exit.

7-Day Money-Back Guarantee:

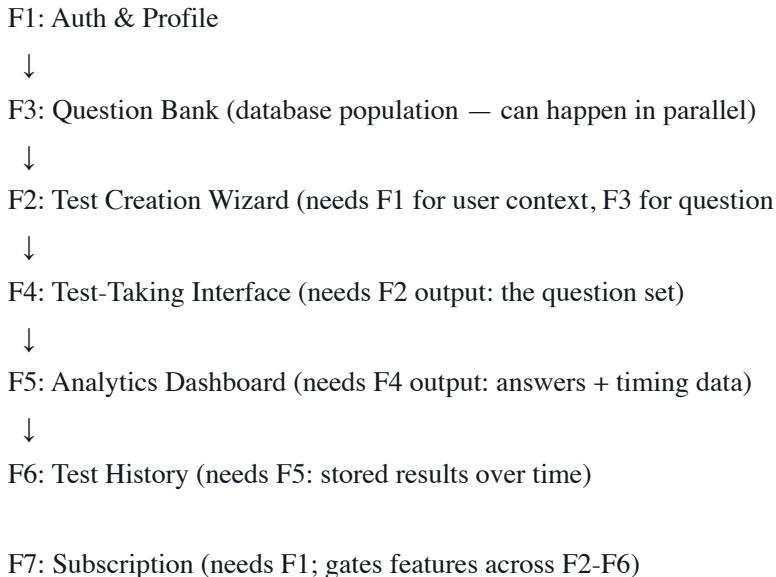
- If user requests refund within 7 days of first paid subscription, process full refund
- Handled via support email (MVP) — automated refund flow in Phase 2
- After refund, user reverts to Free plan

Billing Edge Cases

- **Payment fails on renewal:** Retry 3 times over 7 days. Send email notification after each failure. After 3 failures, downgrade to Free. Grace period: 3 days after final failure before downgrade.
- **Pro user wants to change exam:** Not allowed. Pro locks to the exam selected at subscription time. If they want a different exam, they must cancel and resubscribe (losing subscription continuity) or upgrade to Elite. The subscription flow makes this crystal clear: "You're subscribing to Manthan Pro for [Exam Name]. This cannot be changed. Need multiple exams? Choose Elite."
- **User subscribes to Pro, then wants CSIR-NET:** Cannot access CSIR-NET on Pro. Show: "CSIR-NET requires Elite. Upgrade for ₹400 more/month to access all exams."

3.10 MVP FEATURE DEPENDENCY MAP

This shows the build order — what depends on what.



Critical path: F1 → F3 → F2 → F4 → F5 → F6 (with F7 integrated in parallel)

Longest lead item: F3 (Question Bank population) — this is a content operation, not just engineering. It should start immediately and run in parallel with all engineering work.

3.11 ADDITIONAL MVP FEATURE: TEST MODES

Based on founder input, the test creation wizard includes a **Test Mode** selector. This is a core differentiator — no competitor offers this level of practice intelligence.

Three Test Modes

Mode	Purpose	Question Selection Logic
Standard	Fresh practice — encounter new questions	Selects ONLY questions the user has NOT previously seen (based on User Question History table). If unseen pool is exhausted for the selected filters, warns user before test creation.
Revision	Re-practice — revisit previously attempted questions	Selects ONLY questions the user HAS previously seen. Useful before exams for consolidation.
Weakness	Targeted repair — focus on low-accuracy areas	Selects questions from topics/subtopics where the user's historical accuracy is below a threshold (e.g., <60%). Can include both seen and unseen questions from weak areas.

Where It Appears in the Wizard

Test Mode selection appears in **Step 1 (The Foundation)**, immediately after exam selection:

- Three mode cards: Standard (default), Revision, Weakness
- Each with a one-line description
- Standard is pre-selected
- Revision and Weakness require the user to have taken at least 1 previous test (otherwise greyed out with tooltip: "Take your first test to unlock this mode")

Business Rules

- **Standard mode with no unseen questions:** If all questions matching the user's filters have been seen, show warning: "You've seen all matching questions. Switch to Revision mode or broaden your filters."
- **Weakness mode with no weak areas:** If the user's accuracy across all topics is above the threshold, show: "Great news — no critical weaknesses detected. Try Standard mode for continued practice."
- **Weakness mode threshold:** Accuracy < 60% on a topic qualifies it as "weak." This threshold may be adjusted based on user data post-launch.
- **All three modes** respect the same filters (subject, topics, subtopics, question types, cognitive levels, difficulty) — the mode only changes WHICH questions from the filtered pool are selected.

Dependency

This feature requires the **User Question History table** — a record of every question every user has seen, their answer, correctness, and timing. This table is specified in Module 9 (Technical Architecture).

3.12 FOUNDER DECISIONS (Confirmed February 15, 2026)

Decision 1 — Error Self-Tagging: NOT IN MVP

Decision: Deferred. Students will not tag their incorrect answers by error type (concept gap / careless error / time pressure) in MVP. Simplifies the review flow. Can be added in Phase 2 when we have data on whether students would actually use it.

Decision 2 — Question Repeat Prevention: HANDLED BY TEST MODES

Decision: The original "30-day no-repeat rule" is replaced by the Test Mode system. Standard mode inherently serves unseen questions. Revision mode inherently serves seen questions. The student explicitly chooses their experience. No ambiguous fallback logic needed for repeat handling — the mode IS the logic.

Decision 3 — Pro Exam Switch: NO SWITCHING

Decision: Pro plan locks to the exam selected at subscription. No switches allowed. If a student wants a different exam, they either cancel and resubscribe or upgrade to Elite. This eliminates all edge cases around

switch limits, mid-cycle changes, and exam-specific data continuity.

Implication: The exam selection at Pro subscription time is a one-time, binding choice. The UI must make this very clear: "You're subscribing to Manthan Pro for [Exam Name]. This cannot be changed. Need multiple exams? Choose Elite."

Decision 4 — Auto-Save During Tests: YES, ON EVERY CHANGE

Decision: Every answer selection, change, or clear triggers an auto-save to the server. Reliability is the absolute priority. A student losing answers mid-test is a trust-destroying event that no feature or marketing can recover from.

Implementation note: Use a debounced save (e.g., 500ms after last interaction) to avoid excessive API calls during rapid clicking, but ensure no answer is ever lost.

Decision 5 — Free User Test History: FULL HISTORY, FOREVER

Decision: Free users see their complete test history — every test they've ever taken. No limit, no truncation. This costs nothing to serve and keeps the user connected to their data, building both familiarity and desire for the deeper analytics available on paid plans.

Decision 6 — Exam Config Architecture: CONFIRMED

Decision: Exam configs are built using the Tier System + Syllabus Map + JSON Config architecture discussed in the architectural context session. Each exam's config defines: marking scheme, permissible scope tiers, question type distribution rules, time-per-question defaults, and syllabus mapping (which subjects/topics/subtopics from the master taxonomy are included, renamed, or merged for this exam). Exact configs per exam are part of the content pipeline and will be validated before each exam goes live on the platform.

3.13 UPDATED MVP FEATURE MAP

With test modes confirmed, the updated feature map:

#	Functional Area	Priority	Key Components
F1	User Authentication & Profile	Must Have	Google OAuth, email auth, exam selection onboarding, profile
F2	Test Creation Wizard	Must Have	3-step wizard, live preview, test mode selection (Standard/Revision/Weakness)
F3	Question Bank & Selection Engine	Must Have	Master taxonomy, syllabus maps, tier system, harvester pipeline, selection algorithm
F4	Test-Taking Interface	Must Have	Exam-like UI, timer, navigation, marking scheme, auto-save, LaTeX/Markdown rendering
F5	Post-Test Analytics Dashboard	Must Have	5-tab analytics (Overview, Topic, Question, Time, Recommendations), plan-gated
F6	Test History & Progress Tracking	Must Have	Full history (all plans), progress dashboard (Pro/Elite), saved templates (Pro/Elite)
F7	Subscription & Payment	Must Have	Razorpay, 3 tiers, upgrade/downgrade/cancel, 7-day guarantee

Module 3 complete. All decisions confirmed. Proceeding to Module 4: Test Creation Engine (Detailed Technical Spec).