🧠 MONGODB EXAM MASTER CHEAT-SHEET

(Patterns • Triggers • Operators • Traps)

1️⃣ FIRST DECISION: find() or aggregate() ❓

Use find() ONLY when:

- No calculation
- No grouping
- No sorting by calculated values

Keywords:

display, list, show, fetch

db.railways.find({ Classes: "SL" })

Use aggregate() when question has:

- total / sum / average / max / min
- per / each
- most / least / top
- generate / create / combine

2️⃣ AGGREGATION PIPELINE ORDER (MEMORIZE)

$match → $group → $sort → $limit → $project

⚠️ Wrong order = wrong answer

3️⃣ $match — FILTERING STAGE

Triggers:

- where
- travelling from
- travelling to
- opted insurance
- month / time (string date)

Normal field

{ Classes: "SL" }

Nested field

{ "TravelLocation.Destination": "CHN" }

Date as STRING → regex

{ DateOfJourney: { $regex: /May/i } }

4️⃣ $group — GROUPING & CALCULATION

Question triggers:

Phrase	Use
total	$sum
average	$avg
maximum	$max
minimum	$min
per / each	_id: field

🔥 MOST IMPORTANT RULE

If question does NOT say "per X" → _id: null

{ $group: { _id: null, total: { $sum: "$TotalFare" } } }

5️⃣ $sum — THE BIGGEST EXAM TRAP

Decide WHAT you are counting

Question says	$sum value
passengers	$TotalNumberOfPassengers
frequent / count / tickets	1
total fare	$TotalFare

6️⃣ MOST / LEAST / TOP / HIGHEST QUESTIONS

Pattern (ALWAYS SAME)

$group → $sort (DESC) → $limit

Example:

{ $sort: { totalPassengers: -1 } }

{ $limit: 1 }

7️⃣ DATE QUESTIONS (STRING DATES)

Your format:

"09:00 12/May/2019"

When REGEX is enough ✅

Question	Method
in May	/May/
at 9 AM	/^09:00/
May at 9 AM	/^09:00.*May/

When REGEX is NOT enough ❌

Question	Need
before / after date	$dateFromString
between dates	real Date
sort by date	Date object

8️⃣ $project — OUTPUT & TRANSFORMATION

Use when:

- Display specific fields
- Rename fields
- Generate new values

{ $project: { _id: 0, PNRNO: 1 } }

9️⃣ STRING OPERATIONS (ID GENERATION QUESTIONS)

$substr

Cut part of string

{ $substr: ["$DateOfJourney", 6, 2] }

$concat

Join strings

{ $concat: ["A", "B"] }

$toString

Convert number → string

{ $toString: "$_id" }

$toUpper

{ $toUpper: "may" } → "MAY"

🔟 GENERATE / CREATE / COMBINE QUESTIONS

Trigger words:

- generate
- create
- construct
- build id

Pattern:

aggregate → $project → $concat + $substr

❌ No $group unless explicitly asked

1️⃣1️⃣ COMMON EXAM TRAPS (AVOID THESE)

❌ $sum: 1 for passenger questions
❌ Grouping without $ before field
❌ Sorting before grouping
❌ Using find() with calculations
❌ Assuming fields that don't exist
❌ Using regex for date comparison

1️⃣2️⃣ FINAL 5-SECOND DECISION FLOW (EXAM GOLD)

Ask in this order:

1️⃣ Any calculation? → aggregate
2️⃣ Per / each mentioned? → $group
3️⃣ Most / top? → $sort + $limit
4️⃣ Passengers or trips? → choose $sum
5️⃣ Date string? → regex

🧠 **ONE-LINE MEMORY MANTRA**

Filter → Group → Sort → Limit → Shape

$match → $project (concat/compute) → $group (distinct) → $project (clean)