



QUANTITATIVE APTITUDE

Student Notes

Topic by Topic • October 2026 Edition



19 Chapters • 101 Topics • 2349 Classified Questions

Part A Business Mathematics • Part B Logical Reasoning • Part C Statistics

2026 October Scanner (71st edition)

How this book works

For each topic, first read the Study Material paragraphs named in the “Read first” line. Then work down the **attack bands**. Each band names what the examiner has actually made you do on that topic — **RECALL**, **RECOGNISE**, **COMPUTE** or **SET UP** — carries the formulas and method steps for that mode, says how many seconds one such question is worth, and lists the exact Scanner questions to practise at it.

The section that follows the Contents — **How to Use These Notes** — shows why this paper cannot be answered in the order it is printed, and sets out the three-pass sweep that follows from the classification. Read it once before you begin.

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BEFORE YOU START

How to Use These Notes

Every question in the Scanner has been read and classified — **2349 of them in this paper** — not by topic alone but by **what you have to do to answer it**. That single extra fact is what these notes are built on, and on a two-hour paper it is worth more than any amount of extra reading. Ten minutes here will change how you use the rest of the book.

1. How a topic is laid out

Read it like this	
Read first	The exact Study Material paragraphs the topic rests on. Open the Study Material and read them before the notes — the notes assume you have.
Attack bands	One band for each mode the examiner has actually used on that topic — with the formulas and method steps for that mode, and the exact Scanner questions to practise. Work down the bands in the order printed: they run from the fastest mode to the slowest.
Concept base	A topic the examiner has not yet reached. It is not optional — it has simply not been asked, and it is examinable. This paper carries 1 of them .

2. Reading a question line

PYQ 2024-Sep [49] · Pg 301

COMPUTE
75 sec

Medium

Part of the line	What it tells you
PYQ 2024-Sep	Where it was asked — PYQ a past examination, MTP a mock test paper, RTP a revision test paper — and the sitting. Mock papers name their series as well: MTP 2025-Apr S1 .
[49]	Its number in that paper. Paper 3 runs Business Mathematics first, then Logical Reasoning, then Statistics, so a high number is usually a Statistics question.
Pg 301	The page of the Scanner where the question and its worked answer are printed.
COMPUTE 75 sec	The attack mode, and what one question of that mode is worth in time. Section 3.
asked 4×	The same question has been set that many times across past papers, mock tests and revision tests. Treat these as the highest priority in the topic.
Medium	How demanding the question is, judged from how many separate steps it needs

Part of the line

What it tells you

before an option can be eliminated.

Every question on this paper is a one-mark MCQ, so the notes do not print marks or a question type on each line — they would say the same thing 2349 times. What varies, and what is worth knowing before you start a question, is the **mode** and the **difficulty**.

3. The four attack modes

ICAI publishes a **Skill Assessment Specification Grid** describing the skills it assesses, and every question in this book is keyed to it. But a heading that reads **Remembering** tells you nothing you can act on with the paper in front of you. So each band is headed by what you actually **do** — and the ICAI skill and level are printed beside it, so the classification stays checkable against the Prospectus.

MODE	ICAI skill	What the question wants	Worth	Share	Marks
RECALL	Remembering · Level I	You know it or you do not. Answer it or leave it — never compute.	30 sec	11.8 %	≈ 12 marks
RECOGNISE	Understanding · Level I	Decide which idea is in play, and which option is the trap.	45 sec	6.7%	≈ 7 marks
COMPUTE	Application · Level II	One known formula, substituted and solved straight through.	75 sec	67.9 %	≈ 68 marks
SET UP	Analysis · Level II	The work is turning the words into equations. The arithmetic is the easy half.	150 sec	13.7 %	≈ 14 marks

Share is measured on **past examination questions only** — 1859 of them — because mock and revision papers are practice material, not the assessed paper. Every question carries one mark, so a share of the questions and a share of the marks are the same number, and the Marks column is what that mode is worth in a 100-mark paper.

4. The arithmetic that decides your strategy

Give every question the time its mode actually needs and the paper asks for **130 minutes**. You have **120**. The paper is deliberately over-subscribed by about **10 minutes** — which is the whole difficulty of Paper 3, and it is a scheduling problem before it is a mathematics problem.

MODE	In a 100-mark paper	× time per question	= minutes
RECALL	≈ 12 questions	30 sec	5.9 min

MODE	In a 100-mark paper	× time per question	= minutes
RECOGNISE	≈ 7 questions	45 sec	5.0 min
COMPUTE	≈ 68 questions	75 sec	84.9 min
SET UP	≈ 14 questions	150 sec	34.2 min
TOTAL	100 questions		129.9 min • against 120

Two consequences follow, and neither is obvious:

- **The overdraft is all in one place.** RECALL and RECOGNISE together are only 11 minutes of work for about 18 marks. SET UP is about 14 marks for 34 minutes. A mark taken from the first group costs a fifth of what a mark from the last group costs.
- **So the order you answer in is worth marks, and the order printed on the paper is the wrong one.** Question 1 is a Business Mathematics COMPUTE question; the cheapest marks on the paper are in the nineties. Answering in printed order spends your freshest thirty minutes at the worst exchange rate on the paper.

5. The three-pass sweep

This is the method the classification is for. Three passes through the paper, in mode order rather than in printed order.

PASS	What you answer	Budget	How to work it
1	RECALL and RECOGNISE	15 min	Go through all 100 questions once. Answer only what you know on sight, and mark every other question with its mode as you pass it. You end this pass with about 18 marks banked and a map of the paper.
2	COMPUTE	70 min	The bulk of the paper and the bulk of your marks. One formula each. If a question has not resolved in 90 seconds it is not a COMPUTE question — leave it for pass 3 rather than arguing with it.
3	SET UP	30 min	The ones that need translating before they can be solved. Take them in Logical Reasoning order first: those set up fastest and Part B is more than half SET UP.
—	Sweep	5 min	Fill every blank. See section 7 — on this paper a blank is strictly worse than a guess.

6. The three Parts are three different examinations

This is the finding that surprises most candidates, and it falls straight out of the classification. The three Parts of Paper 3 do not merely cover different subjects — they ask for different skills, in almost opposite proportions.

PART	Marks	RECALL	RECOGNISE	COMPUTE	SET UP	What that means
Part A • Business Mathematics	40	0.8%	3.9%	89.2%	6.1%	Formula drill. Almost nothing to recall — you either have the formula or you do not.
Part B • Logical Reasoning	20	0.6%	1.4%	43.3%	54.7%	Barely any recall at all, and more SET UP than the rest of the paper combined. Time sink.
Part C • Statistics	40	28.2%	12.0%	58.2%	1.5%	The only Part with free marks. Two fifths of it is RECALL and RECOGNISE.

Start your first pass in Part C. Statistics carries 40.3% of its questions at RECALL or RECOGNISE — definitions, properties, which measure is which. That is roughly **16 marks of Part C alone** available in a few minutes, and it is at the far end of the question paper where a candidate working in printed order arrives tired, or does not arrive at all.

Cap Part B. Logical Reasoning is 54.7% SET UP for only 20 marks. It rewards a clean diagram and punishes a re-read. Give it a hard stop and come back only if pass 3 leaves time.

7. Negative marking — when a guess is worth making

Paper 3 deducts a **quarter mark** for a wrong answer. Most candidates read that as a reason to leave hard questions blank. The arithmetic says the opposite.

What you can do	Expected marks per guess	So
Nothing — pure guess, 1 in 4	+0.06	Still better than a blank. A blank scores exactly zero; a guess does not.
Eliminate one option — 1 in 3	+0.17	Worth making every time.
Eliminate two — 1 in 2	+0.38	Worth more than a third of a correct answer.
Leave it blank	0.00	The only choice on this paper with no upside at all.

Which is why the modes matter at the end as well as the beginning. On a **SET UP** question, even an abandoned attempt usually rules out two options — the sign is wrong, or the magnitude is impossible — and that half-finished work is worth **+0.38** a question. Never rub out a partial attempt. On a **RECALL** question there is nothing to eliminate, so guess immediately and spend the time elsewhere.

8. Two guides at the front of the book

	What it is for
Topic Ranking	Every examined topic ranked by its share of the classified Scanner questions, and graded A , B or C on cumulative coverage. Category A carries the first 60% of all questions — secure those to full command first. On a paper of 101 topics this is the single most useful page in the book.
Importance grade	The A–D grade printed against each chapter in the Contents. This is ICAI's syllabus weightage signal as the Scanner publishes it, and it is separate from the question-frequency ranking. Where the two disagree, prepare to the higher of the two.

One caution about the classification. ICAI's own grid prints **no Level I column at all** for this paper — on the Institute's specification Paper 3 is 100% Level II. The questions it has actually set do not read that way: 18.5% of past examination questions on this paper are answered by recall or recognition, nearly all of them in Statistics. The bands in these notes follow **what has been asked**, not what the grid predicts. Prepare for both: treat the 18.5% as marks that are there to be taken quickly, not as marks you are entitled to.

STUDY PRIORITY GUIDE

Topic Ranking — Exam Weightage

Read first: Every topic in this booklet that the examiner has actually asked is ranked below by its share of the 2349 classified Scanner questions, aggregated across all 19 chapters of the paper — and graded A, B or C on cumulative coverage. **Category A (ranks 1–25)** covers the first 60% of all classified questions. **Category B (ranks 26–37)** adds the next 15%, taking coverage to about 75%. **Category C** is the remaining 25%: a long tail that is slower to mine for marks, much of which gets covered automatically while preparing A and B. The **Pg.** column cross-references the page on which that topic's study notes begin.

#	CAT	PART	CHAPTER	TOPIC	SHARE	CUM.	PG.
1	A	B	Blood Relations	Introduction	5.0%	5.0%	114
2	A	B	Direction Tests	Introduction	4.7%	9.7%	102
3	A	B	Seating Arrangements	Introduction	4.3%	14.0%	108
4	A	A	Mathematics of Finance	Compound Interest	3.7%	17.8%	41
5	A	C	Measures of Central Tendency and Dispersion	Standard Deviation	2.7%	20.5%	148
6	A	C	Index Numbers	Construction of Index Number	2.6%	23.1%	189
7	A	B	Number Series, Coding and Decoding and Odd Man Out	Coding and Decoding	2.4%	25.5%	96
8	A	C	Probability	Classical Definition of Probability	2.2%	27.7%	156
9	A	C	Correlation and Regression	Measures of Correlation	2.2%	29.9%	178
10	A	A	Sequence and Series - Arithmetic and Geometric Progressions	Arithmetic Progression	2.1%	32.0%	66
11	A	C	Measures of Central Tendency and	Arithmetic Mean	2.1%	34.1%	135

#	CAT	PART	CHAPTER	TOPIC	SHARE	CUM.	PG.
Dispersion							
12	A	A	Mathematics of Finance	Simple Interest	2.0%	36.1%	38
13	A	A	Equations	Quadratic Equations	1.9%	38.0%	30
14	A	A	Mathematics of Finance	Future Value of Annuity	1.9%	39.9%	49
15	A	B	Number Series, Coding and Decoding and Odd Man Out	Number Series	1.9%	41.8%	94
16	A	C	Theoretical Distributions	Poisson Distribution	1.8%	43.6%	171
17	A	A	Linear Inequalities	Linear Inequalities in one variable and the Solution space	1.8%	45.4%	34
18	A	A	Ratio and Proportion, Indices, Logarithms	Ratio	1.7%	47.2%	18
19	A	C	Theoretical Distributions	Binomial Distribution	1.7%	48.9%	168
20	A	C	Statistical Description of Data	Graphical Representation of Frequency Distribution	1.7%	50.6%	127
21	A	C	Statistical Description of Data	Presentation of Data	1.7%	52.3%	122
22	A	A	Ratio and Proportion, Indices, Logarithms	Logarithm	1.6%	53.9%	24
23	A	A	Mathematics of Finance	Perpetuity; Nominal Rate of Interest; Compounded Annual Growth Rate	1.6%	55.5%	54
24	A	A	Ratio and Proportion, Indices, Logarithms	Indices	1.5%	57.0%	22
25	A	A	Basic Concepts of Permutations and Combinations	Combinations	1.5%	58.6%	61
26	B	A	Sequence and Series - Arithmetic and	Geometric Progression	1.5%	60.1%	69

#	CAT	PART	CHAPTER	TOPIC	SHARE	CUM.	PG.
Geometric Progressions							
27	B	C	Measures of Central Tendency and Dispersion	Median, Quartile, Decile, Percentile	1.5%	61.6%	140
28	B	C	Theoretical Distributions	Normal Distribution or Gaussian Distribution	1.5%	63.2%	174
29	B	A	Mathematics of Finance	Present Value of Annuity	1.4%	64.6%	52
30	B	C	Measures of Central Tendency and Dispersion	Quartile Deviation	1.4%	66.0%	151
31	B	C	Correlation and Regression	Regression Analysis	1.4%	67.4%	181
32	B	A	Basic Concepts of Permutations and Combinations	Permutation	1.3%	68.7%	57
33	B	C	Index Numbers	Test of Adequacy	1.3%	69.9%	194
34	B	A	Sets, Relations and Functions, Basics of Limits and Continuity Functions	Relations and Functions	1.2%	71.2%	75
35	B	C	Measures of Central Tendency and Dispersion	Mode	1.2%	72.4%	143
36	B	A	Sets, Relations and Functions, Basics of Limits and Continuity Functions	Sets	1.1%	73.5%	72
37	B	B	Number Series, Coding and Decoding and Odd Man Out	Odd man out	1.1%	74.6%	100
38	C	C	Statistical Description of Data	Frequency Distribution	1.1%	75.7%	125
39	C	C	Probability	Random Experiment	1.1%	76.8%	154
40	C	C	Probability	Conditional Probability and	1.0%	77.9%	163

#	CAT	PART	CHAPTER	TOPIC	SHARE	CUM.	PG.
				Compound Theorem of Probability			
41	C	A	Equations	Simultaneous Linear Equations in two unknowns	1.0%	78.8%	28
42	C	A	Basic Concepts of Permutations and Combinations	Permutation with Restrictions	1.0%	79.8%	60
43	C	A	Mathematics of Finance	Effective Rate of Interest	0.9%	80.8%	48
44	C	C	Correlation and Regression	Properties of Regression Lines	0.9%	81.7%	183
45	C	C	Measures of Central Tendency and Dispersion	Harmonic Mean	0.8%	82.5%	139
46	C	C	Statistical Description of Data	Collection of Data	0.7%	83.2%	121
47	C	C	Sampling	Types of Sampling	0.7%	84.0%	133
48	C	C	Measures of Central Tendency and Dispersion	Range	0.7%	84.7%	145
49	C	C	Measures of Central Tendency and Dispersion	Mean Deviation	0.7%	85.4%	146
50	C	C	Probability	Operations on Events: Set Theoretic Approach to Probability	0.7%	86.1%	160
51	C	A	Basic Concepts of Permutations and Combinations	Standard Results	0.7%	86.8%	64
52	C	C	Probability	Addition Theorems	0.7%	87.5%	162
53	C	A	Mathematics of Finance	Depreciation	0.6%	88.1%	45
54	C	A	Mathematics of Finance	Difference Between Compound Interest and Simple Interest	0.6%	88.7%	46

#	CAT	PART	CHAPTER	TOPIC	SHARE	CUM.	PG.
55	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Applications of Differential calculus in Economics	0.6%	89.3%	87
56	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Definite Integration	0.6%	89.9%	91
57	C	C	Correlation and Regression	Correlation Analysis	0.6%	90.4%	177
58	C	A	Equations	Simple Equation	0.5%	90.9%	27
59	C	A	Ratio and Proportion, Indices, Logarithms	Proportion	0.5%	91.4%	21
60	C	A	Sets, Relations and Functions, Basics of Limits and Continuity Functions	Various Types of Functions	0.5%	91.9%	78
61	C	A	Equations	Cubic Equations	0.4%	92.3%	32
62	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Important Properties	0.4%	92.7%	92
63	C	C	Probability	Expected Value of a Random Variable	0.4%	93.1%	166
64	C	C	Index Numbers	Issues Involved	0.4%	93.6%	188
65	C	A	Sets, Relations and Functions, Basics of Limits and Continuity Functions	Venn Diagrams	0.4%	94.0%	74
66	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Parametric Equation	0.4%	94.3%	85
67	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Derivative of a Function of Function	0.3%	94.7%	83

#	CAT	PART	CHAPTER	TOPIC	SHARE	CUM.	PG.
68	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Implicit Functions	0.3%	95.0%	84
69	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Integration Calculus	0.3%	95.3%	88
70	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Method of Substitution (change of variable)	0.3%	95.6%	90
71	C	C	Sampling	Some important terms associated with sampling	0.3%	95.9%	132
72	C	A	Sets, Relations and Functions, Basics of Limits and Continuity Functions	Concept of Limit	0.3%	96.1%	79
73	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Logarithmic Differentiation	0.3%	96.4%	85
74	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Basic Formulas	0.3%	96.6%	89
75	C	C	Probability	Random Variable-Probability Distribution	0.3%	96.9%	165
76	C	C	Index Numbers	Shifting and Splicing of Index Numbers	0.3%	97.1%	193
77	C	A	Basic Concepts of Permutations and Combinations	The Factorial	0.2%	97.4%	57
78	C	C	Statistical Description of Data	Introduction of Statistics	0.2%	97.6%	120
79	C	C	Measures of Central Tendency and Dispersion	Geometric Mean	0.2%	97.8%	138

#	CAT	PART	CHAPTER	TOPIC	SHARE	CUM.	PG.
80	C	C	Index Numbers	Usefulness of Index Numbers	0.2%	98.0%	192
81	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Derivative or Differential Coefficient	0.2%	98.2%	82
82	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Some Standard Results (Formulas)	0.2%	98.3%	82
83	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Geometric Interpretation of the Differentiation	0.2%	98.5%	87
84	C	C	Correlation and Regression	Review of Correlation and Regression analysis	0.2%	98.7%	185
85	C	A	Sequence and Series - Arithmetic and Geometric Progressions	Special Series	0.1%	98.8%	71
86	C	A	Sets, Relations and Functions, Basics of Limits and Continuity Functions	Product Sets	0.1%	98.9%	75
87	C	A	Sets, Relations and Functions, Basics of Limits and Continuity Functions	Domain & Range of a Function	0.1%	99.1%	77
88	C	C	Sampling	Basic Principles of Survey	0.1%	99.2%	130
89	C	C	Index Numbers	Introduction	0.1%	99.3%	187
90	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Some More Examples	0.1%	99.4%	86
91	C	C	Sampling	Errors in Sampling	0.1%	99.5%	131
92	C	C	Probability	Introduction	0.1%	99.6%	154
93	C	C	Probability	Statistical Definition of	0.1%	99.7%	159

#	CAT	PART	CHAPTER	TOPIC	SHARE	CUM.	PG.
Probability							
94	C	C	Probability	Axiomatic or Modern Definition of Probability	0.1%	99.7%	161
95	C	A	Basic Concepts of Permutations and Combinations	Circular Permutations	0.0%	99.8%	59
96	C	A	Sets, Relations and Functions, Basics of Limits and Continuity Functions	Useful Rules of Limits	0.0%	99.8%	80
97	C	A	Sets, Relations and Functions, Basics of Limits and Continuity Functions	Continuity	0.0%	99.9%	80
98	C	A	Basic Applications of Differential and Integral Calculus in Business and Economics	Method of Partial Fraction	0.0%	99.9%	91
99	C	C	Theoretical Distributions	Introduction	0.0%	100.0%	168
100	C	C	Index Numbers	Deflating Times Series using Index Numbers	0.0%	100.0%	193

Share % is a question-frequency signal drawn from the Scanner — what has actually been asked. The **Importance grade (A-D)** printed against each Chapter and Unit is ICAI's own weightage signal as published in the Scanner's front matter. The two measure different things, and where they diverge, prepare to the higher of the two standards. A further **1 topics** are declared in the Scanner's frequency tables but carry no question yet; they are badged **CONCEPT BASE** in the notes and are not ranked here.

CHAPTER 1

Ratio and Proportion, Indices, Logarithms

4 Topics · 126 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 79 sec a question on average — **about the pace of the paper**

RECOGNISE Understanding	1.1%	45 sec	1 of 94 past-exam questions
COMPUTE Application	93.6%	75 sec	88 of 94 past-exam questions
SET UP Analysis	5.3%	150 sec	5 of 94 past-exam questions

Topic 1: Ratio

P3-C1-U1-T01

Read first Study Section 1.1 (Ratio): antecedent and consequent, inverse ratio (1.1.3), compound, duplicate/sub-duplicate/triplicate and continued ratios, plus the worked examples on incomes, coins, ages and partnership.

RECOGNISE 45 sec decide which idea applies · 1 question Understanding · Level I

- In $a : b$, a is the antecedent and b the consequent; the inverse ratio is $b : a$ — MCQs deliberately swap these terms.
- A ratio needs like quantities in the same units, has no unit, and is unchanged when both terms are multiplied by the same non-zero number.
- Distinguish duplicate $a^2 : b^2$, sub-duplicate $\sqrt{a} : \sqrt{b}$ and triplicate $a^3 : b^3$ ratios — options mix these up.

PYQ 2021-Jan [4] · Pg 7

RECOGNISE
45 sec

Easy

COMPUTE 75 sec one formula, straight through · 32 questions Application · Level II

- Chain ratios: $a:d = (a/b)(b/c)(c/d)$; equalise the common term to merge two ratios into $a:b:c$.
- Numbers in ratio $m:n$ — write mk, nk , impose the given condition (sum, difference of squares, adding 7 to each) and solve for k .
- For $(3a+2b):(4a+5b)$ with $a:b$ known, substitute $a = 3k, b = 7k$ and simplify.
- Coin-value type: counts mk, nk at denominations d_1, d_2 ; equate one value to the given amount to find k .

PYQ 2018-Nov [1] · Pg 3

COMPUTE
75 sec

Easy

PYQ 2018-Nov [3] · Pg 3

COMPUTE

Easy

	75 sec	
PYQ 2019-Nov [2] · Pg 5	COMPUTE 75 sec	Easy
PYQ 2020-Nov [1] · Pg 6	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [6] · Pg 17	COMPUTE 75 sec	Easy
PYQ 2018-May [1] · Pg 2	COMPUTE 75 sec	Medium
PYQ 2019-Jun [1] · Pg 4	COMPUTE 75 sec	Medium
PYQ 2019-Nov [1] · Pg 4	COMPUTE 75 sec	Medium
PYQ 2020-Nov [4] · Pg 6	COMPUTE 75 sec	Medium
PYQ 2020-Nov [5] · Pg 6	COMPUTE 75 sec	Medium
PYQ 2021-Jan [3] · Pg 7	COMPUTE 75 sec	Medium
PYQ 2021-Jul [1] · Pg 7 asked 2×	COMPUTE 75 sec	Medium
PYQ 2021-Jul [2] · Pg 8	COMPUTE 75 sec	Medium
PYQ 2021-Dec [3] · Pg 10	COMPUTE 75 sec	Medium
PYQ 2021-Dec [7] · Pg 11	COMPUTE 75 sec	Medium
PYQ 2022-Jun [3] · Pg 11	COMPUTE 75 sec	Medium
PYQ 2022-Jun [4] · Pg 12	COMPUTE 75 sec	Medium
PYQ 2022-Dec [5] · Pg 12	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [1] · Pg 13	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [8] · Pg 13	COMPUTE 75 sec	Medium
PYQ 2025-Jan [25] · Pg 14	COMPUTE 75 sec	Medium
PYQ 2025-Jan [26] · Pg 15	COMPUTE 75 sec	Medium
PYQ 2025-Jan [34] · Pg 16	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [7] · Pg 17	COMPUTE 75 sec	Medium
RTP 2025-Jan [1] · Pg 17	COMPUTE	Medium

	75 sec	
PYQ 2025-May [1] · Pg 17	COMPUTE 75 sec	Medium
PYQ 2025-Sep [3] · Pg 19	COMPUTE 75 sec	Medium
PYQ 2026-Jan [53] · Pg 22	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [12] · Pg 24	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [1] · Pg 24	COMPUTE 75 sec	Medium
PYQ 2026-May [56] · Pg 24	COMPUTE 75 sec	Medium
PYQ 2026-Sep [75] · Pg 25	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 8 questions · Analysis · Level II

- Income--expenditure--savings: incomes 5k, 4k, expenditures 3m, 2m; write $\text{Saving} = \text{Income} - \text{Expenditure}$ per person, solve the two equations.
- Three-coin problems: combine the count equation and the value equation, using the given ratio to reduce to one unknown.
- Mixture/replacement and age problems: write before/after amounts as ratio multiples, apply the change, equate to the new ratio.
- Partnership: profit divides in ratio of (capital $\times$ time); compute capital-months first.

PYQ 2021-Jul [3] · Pg 9	SET UP 150 sec	Medium
MTP 2024-Aug S2 [1] · Pg 13	SET UP 150 sec	Medium
PYQ 2024-Sep [32] · Pg 14	SET UP 150 sec	Medium
MTP 2025-Jan S2 [1] · Pg 17	SET UP 150 sec	Medium
PYQ 2025-Sep [2] · Pg 18	SET UP 150 sec	Medium
PYQ 2026-Jan [52] · Pg 23	SET UP 150 sec	Medium
PYQ 2021-Dec [2] · Pg 9	SET UP 150 sec	Hard
MTP 2024-Aug S2 [10] · Pg 13	SET UP 150 sec	Hard

Topic 2: Proportion

P3-C1-U1-T02

Read first Study Section 1.2 (Proportion) and 1.2.1 (Properties of Proportion): cross-product rule, continued proportion, mean/third/fourth proportional, and properties like invertendo, alternendo, componendo, dividendo and addendo.

COMPUTE 75 sec one formula, straight through · 11 questions Application · Level II

- Four quantities a, b, c, d are in proportion iff $ad = bc$ (product of extremes = product of means); use this to find the missing term, e.g. $1/4 : 1/6 = 1/10 : 1/x$.
- Mean proportional between a and $b = \sqrt{ab}$ (e.g. $\sqrt{24 \times 54} = 36$); third proportional to $a, b = b^2/a$; fourth proportional to $a, b, c = bc/a$.
- Sharing in proportion $5:2:4:3$ — each share is $5k, 2k, 4k, 3k$; translate the given gap (C gets ₹1,000 more than D means $4k - 3k = 1,000$) to find k , then the asked share.
- Linking two ratios (first:second, second:third) — equalise the middle term to get $a:b:c$, then use the total sum to find each number.

PYQ 2018-May [3] · Pg 26	COMPUTE 75 sec	Easy
PYQ 2022-Dec [3] · Pg 26	COMPUTE 75 sec	Easy
PYQ 2024-Jun [3] · Pg 26	COMPUTE 75 sec	Easy
PYQ 2024-Sep [33] · Pg 27	COMPUTE 75 sec	Easy
RTP 2024-Sep [1] · Pg 27 asked 2×	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [2] · Pg 28 asked 2×	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [3] · Pg 29	COMPUTE 75 sec	Easy
PYQ 2026-May [55] · Pg 29	COMPUTE 75 sec	Easy
PYQ 2026-Sep [77] · Pg 29	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [2] · Pg 27	COMPUTE 75 sec	Medium
PYQ 2025-May [2] · Pg 28 asked 2×	COMPUTE 75 sec	Medium

Topic 3: Indices

P3-C1-U1-T03

Read first Study Section 1.3 (Indices) — the laws of indices: $a^m \times a^n = a^{(m+n)}$, $a^m \div a^n = a^{(m-n)}$, $(a^m)^n = a^{mn}$, $a^0 = 1$, $a^{-n} = 1/a^n$, fractional indices as roots — and the worked examples on equal-power equations and cyclic-symmetry expressions.

COMPUTE 75 sec one formula, straight through · 36 questions Application · Level II

- Drill the laws: $a^m \times a^n = a^{(m+n)}$, $(a^m)^n = a^{mn}$, $a^0 = 1$, $a^{-n} = 1/a^n$; with unlike bases, rewrite in prime bases ($75 = 3 \times 5^2$) before comparing powers.
- Equal-exponentials ($3^x = 5^y = 75^z$): set all equal to k , write each base as a power of k , match $75 = 3 \times 5^2$ to get $1/z = 1/x + 2/y$.
- Cyclic sums $1/(1+x^{a-b}+x^{a-c}) + \dots$ always collapse to 1; $abc = 2$ type sums use the same trick.
- If $P = x^{(1/3)} + x^{(-1/3)}$, then $P^3 - 3P = x + 1/x$ — memorise; for surd pairs a, b use $a^2 + b^2 = (a+b)^2 - 2ab$.

MTP 2025-Jan S2 [5] · Pg 45	COMPUTE 75 sec	Easy
PYQ 2018-May [5] · Pg 29	COMPUTE 75 sec	Medium
PYQ 2018-Nov [2] · Pg 30	COMPUTE 75 sec	Medium
PYQ 2019-Jun [2] · Pg 31	COMPUTE 75 sec	Medium
PYQ 2019-Jun [5] · Pg 31	COMPUTE 75 sec	Medium
PYQ 2019-Nov [4] · Pg 32	COMPUTE 75 sec	Medium
PYQ 2019-Nov [5] · Pg 32	COMPUTE 75 sec	Medium
PYQ 2020-Nov [6] · Pg 33	COMPUTE 75 sec	Medium
PYQ 2021-Jan [1] · Pg 34	COMPUTE 75 sec	Medium
PYQ 2021-Dec [1] · Pg 35	COMPUTE 75 sec	Medium
PYQ 2021-Dec [6] · Pg 36	COMPUTE 75 sec	Medium
PYQ 2021-Dec [8] · Pg 36	COMPUTE 75 sec	Medium
PYQ 2021-Dec [9] · Pg 37	COMPUTE 75 sec	Medium
PYQ 2022-Jun [5] · Pg 38	COMPUTE 75 sec	Medium

PYQ 2022-Dec [4] · Pg 38	COMPUTE 75 sec	Medium
PYQ 2023-Jun [1] · Pg 39	COMPUTE 75 sec	Medium
PYQ 2023-Jun [4] · Pg 39	COMPUTE 75 sec	Medium
PYQ 2023-Dec [1] · Pg 40	COMPUTE 75 sec	Medium
PYQ 2023-Dec [2] · Pg 40	COMPUTE 75 sec	Medium
PYQ 2024-Jun [2] · Pg 41 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [2] · Pg 42	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [3] · Pg 42	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [4] · Pg 42	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [5] · Pg 43	COMPUTE 75 sec	Medium
PYQ 2024-Sep [29] · Pg 43	COMPUTE 75 sec	Medium
PYQ 2025-Jan [24] · Pg 43	COMPUTE 75 sec	Medium
PYQ 2025-Jan [27] · Pg 44	COMPUTE 75 sec	Medium
PYQ 2025-Jan [33] · Pg 45	COMPUTE 75 sec	Medium
PYQ 2025-May [4] · Pg 45	COMPUTE 75 sec	Medium
PYQ 2026-Jan [49] · Pg 46	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [1] · Pg 47	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [8] · Pg 47	COMPUTE 75 sec	Medium
PYQ 2026-May [58] · Pg 47	COMPUTE 75 sec	Medium
PYQ 2026-May [54] · Pg 48	COMPUTE 75 sec	Medium
PYQ 2026-Sep [78] · Pg 50	COMPUTE 75 sec	Medium
PYQ 2021-Jul [4] · Pg 34	COMPUTE 75 sec	Hard

SET UP 150 sec set it up before you compute — no question in this edition Analysis · Level II

- Conditional problems ($u^5x = v^5y = w^5z$, $u^2 = vw$): set the common value k , express u, v, w as powers of k , substitute into the condition and equate exponents (answer 0).
- Shortcut: symmetric index expressions usually reduce to 0, 1 or a small constant — sanity-check by putting $x = y = z$.

Topic 4: Logarithm

P3-C1-U1-T04

Read first Study Section 1.4 (Logarithm), 1.4.1 (Fundamental Laws of Logarithm) and 1.4.2 (Change of Base): definition $\log_a x = n$ iff $a^n = x$, product/quotient/power rules, base change, and the illustrations using $\log 2 = 0.3010$, $\log 3 = 0.4771$.

COMPUTE 75 sec one formula, straight through · 38 questions Application · Level II

- Memorise and drill: $\log(mn) = \log m + \log n$; $\log(m/n) = \log m - \log n$; $\log m^n = n \log m$; $\log_a a = 1$; $\log_a 1 = 0$; $a^{(\log_a x)} = x$.
- Change of base: $\log_a m = \log m / \log a$; product chains like $\log_4 9 \times \log_3 2 = (2 \log 3 / 2 \log 2)(\log 2 / \log 3) = 1$ — cancel numerators against denominators.
- Numeric values type: split the number into powers of 2 and 3 ($24 = 2^3 \times 3$) and substitute $\log 2 = 0.3010$, $\log 3 = 0.4771$.
- Nested logs ($\log_3[\log_4(\log_2 x)] = 0$): peel from outside in — outer = 0 means inner = 1, then inner = base, giving $x = 2^4 = 16$; for $\log_{0.01} 10000$, write both as powers of 10 and use $\log_{(10^{-2})} 10^4 = 4/(-2) = -2$.

PYQ 2018-Nov [4] · Pg 51	COMPUTE 75 sec	Easy
PYQ 2020-Nov [2] · Pg 53	COMPUTE 75 sec	Easy
PYQ 2020-Nov [3] · Pg 53	COMPUTE 75 sec	Easy
PYQ 2023-Jun [3] · Pg 58	COMPUTE 75 sec	Easy
PYQ 2024-Jun [1] · Pg 58	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [23] · Pg 59	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [24] · Pg 59	COMPUTE 75 sec	Easy
PYQ 2018-May [2] · Pg 50	COMPUTE 75 sec	Medium
PYQ 2018-May [4] · Pg 50	COMPUTE 75 sec	Medium

PYQ 2019-Jun [3] · Pg 51	COMPUTE 75 sec	Medium
PYQ 2019-Jun [4] · Pg 52	COMPUTE 75 sec	Medium
PYQ 2019-Nov [3] · Pg 52	COMPUTE 75 sec	Medium
PYQ 2021-Jan [2] · Pg 54	COMPUTE 75 sec	Medium
PYQ 2021-Jul [5] · Pg 54	COMPUTE 75 sec	Medium
PYQ 2021-Dec [4] · Pg 55	COMPUTE 75 sec	Medium
PYQ 2021-Dec [5] · Pg 55	COMPUTE 75 sec	Medium
PYQ 2022-Jun [1] · Pg 56	COMPUTE 75 sec	Medium
PYQ 2022-Jun [2] · Pg 56	COMPUTE 75 sec	Medium
PYQ 2022-Jun [6] · Pg 57	COMPUTE 75 sec	Medium
PYQ 2022-Dec [1] · Pg 57	COMPUTE 75 sec	Medium
PYQ 2022-Dec [2] · Pg 57	COMPUTE 75 sec	Medium
PYQ 2023-Jun [2] · Pg 58	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [6] · Pg 59	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [7] · Pg 59	COMPUTE 75 sec	Medium
PYQ 2024-Sep [34] · Pg 60	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [1] · Pg 60	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [2] · Pg 60	COMPUTE 75 sec	Medium
PYQ 2025-May [3] · Pg 60	COMPUTE 75 sec	Medium
PYQ 2025-Sep [4] · Pg 61	COMPUTE 75 sec	Medium
PYQ 2025-Sep [1] · Pg 62	COMPUTE 75 sec	Medium
PYQ 2026-Jan [50] · Pg 63	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [4] · Pg 64	COMPUTE 75 sec	Medium

RTP 2025-Jan [2] · Pg 64 asked 2×	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [3] · Pg 64	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [4] · Pg 64	COMPUTE 75 sec	Medium
PYQ 2026-May [57] · Pg 64	COMPUTE 75 sec	Medium
PYQ 2026-Sep [76] · Pg 66	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [9] · Pg 59	COMPUTE 75 sec	Hard

CHAPTER 2

Equations

4 Topics · 90 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 87 sec a question on average — **about the pace of the paper**

COMPUTE Application	84.1%	75 sec	58 of 69 past-exam questions
SET UP Analysis	15.9%	150 sec	11 of 69 past-exam questions

Topic 1: Simple Equation

P3-C2-U2-T01

Read first Study Sections 2.1--2.2: meaning and degree of an equation, the rule that a simple (linear) equation in one unknown has exactly one root, and the illustrations translating word statements into a linear equation.

RECOGNISE 45 sec decide which idea applies — no question in this edition Understanding · Level I

- A simple equation $ax + b = 0$ ($a \neq 0$) has exactly one root, $x = -b/a$; the degree fixes the number of roots.
- Standard fact: for positive real x , the sum of a quantity's square and its reciprocal-square pattern is never less than 2 ($AM \geq GM$).
- Distinguish an identity (true for all x) from an equation (true for specific x).

COMPUTE 75 sec one formula, straight through · 7 questions Application · Level II

- Word problems: let the quantity be x , convert each phrase ('twice', '3 cm more') into an expression, form one linear equation, solve.
- Equal-cost type ($\text{₹}600 + \text{₹}50/\text{hr}$ vs $\text{₹}170/\text{hr}$): equate the two totals and solve for n .
- Dividing a total: parts x and $(\text{total} - x)$; for three parts express all in terms of one variable.
- Nested simplifications like $[1 - \{1 - (1 - x^2)^{-1}\}^{-1}]^{-1/2}$: resolve innermost bracket outward.

PYQ 2022-Jun [9] · Pg 72	COMPUTE 75 sec	Easy
PYQ 2019-Nov [7] · Pg 71	COMPUTE 75 sec	Medium
PYQ 2022-Jun [10] · Pg 73	COMPUTE 75 sec	Medium
PYQ 2023-Jun [6] · Pg 73	COMPUTE 75 sec	Medium
PYQ 2023-Dec [4] · Pg 74	COMPUTE	Medium

	75 sec	
MTP 2024-Dec S1 [4] · Pg 75	COMPUTE 75 sec	Medium
PYQ 2026-Sep [55] · Pg 76	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 5 questions · Analysis · Level II

- Marking-scheme problems (100 questions, 60% with negative marking): correct = x , wrong = $100 - x$, form the marks equation.
- Motion problems (elevators, walking speed $\pm$): write a distance/floors equation per mover and use the meeting or time-difference condition.
- Cost-per-article type: (number)(cost each) = total cost; the stated link between them yields an equation that factorises.

PYQ 2018-May [9] · Pg 70 asked 2×	SET UP 150 sec	Medium
PYQ 2021-Dec [11] · Pg 72	SET UP 150 sec	Medium
MTP 2024-Dec S1 [3] · Pg 75	SET UP 150 sec	Medium
MTP 2024-Dec S1 [5] · Pg 75	SET UP 150 sec	Medium
PYQ 2025-May [6] · Pg 75	SET UP 150 sec	Medium

Topic 2: Simultaneous Linear Equations in two unknowns

P3-C2-U2-T02

Read first Study Sections 2.3--2.4: forming a pair of linear equations in x and y and solving by the Elimination Method and Cross Multiplication Method, plus the worked problems leading to simultaneous equations (digits, ages, costs).

COMPUTE 75 sec one formula, straight through · 15 questions · Application · Level II

- Elimination method: scale the equations so one variable's coefficients match, subtract, solve, back-substitute — fastest for exam MCQs.
- Cross multiplication: for $a_1x + b_1y + c_1 = 0$, $a_2x + b_2y + c_2 = 0$, $x/(b_1c_2 - b_2c_1) = y/(c_1a_2 - c_2a_1) = 1/(a_1b_2 - a_2b_1)$.
- Equations with fractions in x and y : substitute $u = 1/x$, $v = 1/y$ to make them linear, solve for u , v , then invert.
- Shortcut: verify options by direct substitution into both equations — often faster than solving.

PYQ 2023-Dec [5] · Pg 81	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [27] · Pg 82	COMPUTE 75 sec	Easy
MTP 2024-Dec S1 [9] · Pg 84	COMPUTE 75 sec	Easy
PYQ 2026-May [4] · Pg 87	COMPUTE 75 sec	Easy
PYQ 2018-May [7] · Pg 76	COMPUTE 75 sec	Medium
PYQ 2018-May [8] · Pg 77 asked 2×	COMPUTE 75 sec	Medium
PYQ 2022-Jun [7] · Pg 79	COMPUTE 75 sec	Medium
PYQ 2022-Dec [8] · Pg 80	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [8] · Pg 84	COMPUTE 75 sec	Medium
PYQ 2025-Jan [31] · Pg 84	COMPUTE 75 sec	Medium
PYQ 2026-Jan [1] · Pg 85	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [4] · Pg 86	COMPUTE 75 sec	Medium
PYQ 2026-Sep [30] · Pg 87	COMPUTE 75 sec	Medium
PYQ 2026-Sep [53] · Pg 87	COMPUTE 75 sec	Medium
PYQ 2026-Sep [54] · Pg 87	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 8 questions Analysis · Level II

- Two-digit number problems: number = $10t + u$; 'digits reversed' gives $10u + t$; translate the relation between digits ($u = 3t$ etc.) and the add/subtract condition into two equations.
- Age problems: write present ages as x and y , then shift both by the stated years ('after 10 years') before equating — the shift applies to every person.
- Cost problems where a price changes (apple's cost doubled): keep original unit costs as x, y ; write one equation per scenario with the changed coefficient.
- Fraction problems: let the fraction be x/y and apply each modification to numerator and denominator separately to get two equations.

PYQ 2019-Jun [6] · Pg 77	SET UP 150 sec	Medium
PYQ 2021-Jul [8] · Pg 78	SET UP 150 sec	Medium

PYQ 2023-Jun [8] · Pg 80 asked 2×	SET UP 150 sec	Medium
PYQ 2024-Jun [8] · Pg 81	SET UP 150 sec	Medium
PYQ 2024-Sep [30] · Pg 82 asked 2×	SET UP 150 sec	Medium
PYQ 2024-Sep [31] · Pg 83	SET UP 150 sec	Medium
PYQ 2025-May [5] · Pg 85	SET UP 150 sec	Medium
MTP 2024-Dec S1 [10] · Pg 84	SET UP 150 sec	Hard

Topic 3: Quadratic Equations

P3-C2-U2-T03

Read first Study Sections 2.7--2.10: standard form $ax^2 + bx + c = 0$, roots by formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$, sum of roots = $-b/a$ and product = c/a , constructing an equation from its roots, nature of roots via the discriminant $b^2 - 4ac$, and problems on quadratics.

COMPUTE 75 sec one formula, straight through · 44 questions Application · Level II

- Memorise: $\alpha + \beta = -b/a$, $\alpha\beta = c/a$; equation from roots: $x^2 - (\alpha+\beta)x + \alpha\beta = 0$.
- Symmetric functions: $\alpha^2 + \beta^2 = (\alpha+\beta)^2 - 2\alpha\beta$; $(\alpha-\beta)^2 = (\alpha+\beta)^2 - 4\alpha\beta$; $1/\alpha + 1/\beta = (\alpha+\beta)/\alpha\beta$ — reduce every asked expression to sum and product.
- Discriminant $b^2 - 4ac$: > 0 real unequal, $= 0$ real equal, < 0 imaginary conjugates; irrational roots come in surd pairs.
- Root conditions: one root double the other gives $2b^2 = 9ac$; roots differing by d — set $(\alpha+\beta)^2 - 4\alpha\beta = d^2$.

PYQ 2018-May [6] · Pg 88	COMPUTE 75 sec	Easy
PYQ 2019-Nov [9] · Pg 92	COMPUTE 75 sec	Easy
PYQ 2021-Dec [12] · Pg 97	COMPUTE 75 sec	Easy
PYQ 2022-Jun [8] · Pg 97	COMPUTE 75 sec	Easy
PYQ 2024-Jun [5] · Pg 101	COMPUTE 75 sec	Easy
PYQ 2024-Jun [6] · Pg 102	COMPUTE 75 sec	Easy
PYQ 2024-Jun [7] · Pg 102	COMPUTE 75 sec	Easy
PYQ 2024-Sep [36] · Pg 103	COMPUTE	Easy

	75 sec	
MTP 2024-Dec S1 [6] · Pg 104	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [8] · Pg 105	COMPUTE 75 sec	Easy
PYQ 2025-May [7] · Pg 106	COMPUTE 75 sec	Easy
PYQ 2018-May [10] · Pg 88 asked 2×	COMPUTE 75 sec	Medium
PYQ 2018-Nov [5] · Pg 89	COMPUTE 75 sec	Medium
PYQ 2018-Nov [6] · Pg 90	COMPUTE 75 sec	Medium
PYQ 2019-Jun [7] · Pg 90	COMPUTE 75 sec	Medium
PYQ 2019-Nov [8] · Pg 91	COMPUTE 75 sec	Medium
PYQ 2020-Nov [8] · Pg 92	COMPUTE 75 sec	Medium
PYQ 2020-Nov [9] · Pg 93	COMPUTE 75 sec	Medium
PYQ 2021-Jan [5] · Pg 93	COMPUTE 75 sec	Medium
PYQ 2021-Jan [7] · Pg 94	COMPUTE 75 sec	Medium
PYQ 2021-Jul [6] · Pg 95	COMPUTE 75 sec	Medium
PYQ 2021-Dec [10] · Pg 96	COMPUTE 75 sec	Medium
PYQ 2022-Dec [6] · Pg 98	COMPUTE 75 sec	Medium
PYQ 2022-Dec [7] · Pg 99	COMPUTE 75 sec	Medium
PYQ 2023-Jun [5] · Pg 99	COMPUTE 75 sec	Medium
PYQ 2023-Jun [7] · Pg 100	COMPUTE 75 sec	Medium
PYQ 2023-Dec [7] · Pg 100	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [26] · Pg 103	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [11] · Pg 103	COMPUTE 75 sec	Medium
RTP 2024-Sep [3] · Pg 104 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [7] · Pg 104	COMPUTE	Medium

	75 sec	
PYQ 2025-Jan [29] · Pg 104	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [12] · Pg 106	COMPUTE 75 sec	Medium
PYQ 2025-Sep [5] · Pg 106	COMPUTE 75 sec	Medium
PYQ 2025-Sep [7] · Pg 107	COMPUTE 75 sec	Medium
PYQ 2025-Sep [6] · Pg 108	COMPUTE 75 sec	Medium
PYQ 2026-Jan [51] · Pg 108	COMPUTE 75 sec	Medium
PYQ 2026-Jan [3] · Pg 109	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [2] · Pg 110	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [3] · Pg 110	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [5] · Pg 110	COMPUTE 75 sec	Medium
PYQ 2026-May [1] · Pg 110	COMPUTE 75 sec	Medium
RTP 2026-May [2] · Pg 112	COMPUTE 75 sec	Medium
RTP 2026-May [15] · Pg 112 asked 2×	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 1 question Analysis · Level II

- Number problems (sum 13, sum of squares 85): build the quadratic from sum/product, factorise, check roots against the wording.
- Surd substitutions ($x = 5 + 2\sqrt{6}$): find the quadratic x satisfies, then reduce $x^2 - 10x + 1$ using it instead of direct squaring.
- Parameter questions: substitute the known root to find k , or impose the root relation on $-b/a$ and c/a ; verify by re-substitution.

PYQ 2021-Jan [6] · Pg 94

SET UP
150 sec

Medium

Topic 4: Cubic Equations

P3-C2-U2-T04

Read first Study Section 2.11 (Solution of Cubic Equation): finding one rational root by trial (factors of the constant term), then reducing to a quadratic by synthetic division or factorisation; note sum of roots = $-b/a$, sum of pairwise products = c/a , product = $-d/a$ for $ax^3 + bx^2 + cx + d = 0$.

COMPUTE 75 sec one formula, straight through · 10 questions Application · Level II

- Trial-root method: test $x = \pm 1, \pm 2, \pm 3$ (divisors of the constant term); once $f(k) = 0$, divide by $(x - k)$ and solve the remaining quadratic.
- MCQ shortcut: check each option triplet against sum of roots $= -b/a$ and product of roots $= -d/a$ — the pair of checks eliminates wrong options without solving.
- Grouping pattern: equations like $x^3 + 9x^2 - x - 9 = 0$ factor by grouping into $(x + 9)(x^2 - 1)$, giving roots $-9, 1, -1$ instantly.
- Finding a parameter: if a given value is a root (2 is a root of $x^3 - (k+1)x + k = 0$), substitute it and solve the resulting linear equation in k .

PYQ 2021-Jul [7] · Pg 113	COMPUTE 75 sec	Easy
PYQ 2019-Nov [6] · Pg 112	COMPUTE 75 sec	Medium
PYQ 2020-Nov [7] · Pg 113	COMPUTE 75 sec	Medium
PYQ 2021-Dec [13] · Pg 113	COMPUTE 75 sec	Medium
PYQ 2023-Dec [3] · Pg 114	COMPUTE 75 sec	Medium
PYQ 2023-Dec [6] · Pg 114	COMPUTE 75 sec	Medium
PYQ 2024-Jun [4] · Pg 115	COMPUTE 75 sec	Medium
PYQ 2024-Sep [37] · Pg 115	COMPUTE 75 sec	Medium
RTP 2024-Sep [2] · Pg 116 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-May [8] · Pg 116	COMPUTE 75 sec	Medium

CHAPTER 3

Linear Inequalities

1 Topics · 42 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 75 sec a question on average — **about the pace of the paper**

RECALL Remembering	3.1%	30 sec	1 of 32 past-exam questions
RECOGNISE Understanding	25.0%	45 sec	8 of 32 past-exam questions
COMPUTE Application	59.4%	75 sec	19 of 32 past-exam questions
SET UP Analysis	12.5%	150 sec	4 of 32 past-exam questions

Topic 1: Linear Inequalities in one variable and the Solution space

P3-C3-U3-T01

Read first Study the Linear Inequalities chapter: forms of linear inequalities, solution space, graphing an inequation and its half-plane, the common (feasible) region, and forming inequalities from business constraints.

RECALL 30 sec know it or move on · 1 question Remembering · Level I

- A linear inequality in two variables has the form $ax + by \leq c$ (or $\geq, <, >$) — no product or squared terms like xy or x^2 .
- Points satisfying an inequality form its solution space; the common region is the feasible region — always convex, corners = feasible points.

PYQ 2018-May [11] · Pg 122

RECALL
30 sec

Easy

RECOGNISE 45 sec decide which idea applies · 11 questions Understanding · Level I

- 'Not more than / at most' $\rightarrow \leq$; 'at least' $\rightarrow \geq$; e.g. at most 11 people $\rightarrow x + y \leq 11$.
- Ratio policies ('not more than 8 men to 3 women') cross-multiply to $3x \leq 8y$; work-rate floors give $5x + 3y \geq 30$; objective function = per-unit profits $\times$ quantities.
- Match graphs: boundary from intercepts, shade the side where (0,0) tests true; know bounded vs unbounded vs no-solution systems.

PYQ 2019-Jun [8] · Pg 123

RECOGNISE
45 sec

Easy

PYQ 2023-Jun [9] · Pg 128

RECOGNISE
45 sec

Easy

PYQ 2023-Dec [8] · Pg 129	RECOGNISE 45 sec	Easy
PYQ 2024-Jun [9] · Pg 129	RECOGNISE 45 sec	Easy
MTP 2024-Dec S1 [12] · Pg 133	RECOGNISE 45 sec	Easy
PYQ 2025-Jan [30] · Pg 134 asked 2×	RECOGNISE 45 sec	Easy
MTP 2025-Jan S2 [14] · Pg 135	RECOGNISE 45 sec	Easy
PYQ 2026-May [5] · Pg 142	RECOGNISE 45 sec	Easy
PYQ 2021-Dec [14] · Pg 126	RECOGNISE 45 sec	Medium
RTP 2024-Sep [4] · Pg 132 asked 2×	RECOGNISE 45 sec	Medium
PYQ 2026-May [2] · Pg 143	RECOGNISE 45 sec	Medium

COMPUTE 75 sec one formula, straight through · 25 questions Application · Level II

- One-variable systems: solve each inequality separately, intersect the intervals; list integers if $x \in \mathbb{N}$.
- Common region: plot boundaries via intercepts, shade feasible sides, take the overlap; verify with an interior test point.
- Corner points: solve boundary lines pairwise, keep points meeting all constraints — vertices give the region's shape.

PYQ 2019-Jun [9] · Pg 123	COMPUTE 75 sec	Easy
PYQ 2024-Jun [10] · Pg 130	COMPUTE 75 sec	Easy
PYQ 2026-Jan [2] · Pg 141 asked 3×	COMPUTE 75 sec	Easy
PYQ 2018-Nov [7] · Pg 122 asked 2×	COMPUTE 75 sec	Medium
PYQ 2019-Jun [10] · Pg 124	COMPUTE 75 sec	Medium
PYQ 2019-Nov [10] · Pg 124	COMPUTE 75 sec	Medium
PYQ 2020-Nov [10] · Pg 125	COMPUTE 75 sec	Medium
PYQ 2021-Jan [8] · Pg 125	COMPUTE 75 sec	Medium
PYQ 2021-Dec [15] · Pg 127	COMPUTE 75 sec	Medium

PYQ 2022-Dec [10] · Pg 128 asked 2×	COMPUTE 75 sec	Medium
PYQ 2024-Sep [38] · Pg 131	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [11] · Pg 132 asked 2×	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [13] · Pg 134	COMPUTE 75 sec	Medium
PYQ 2025-May [9] · Pg 135 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-Sep [8] · Pg 136	COMPUTE 75 sec	Medium
PYQ 2025-Sep [9] · Pg 137	COMPUTE 75 sec	Medium
PYQ 2025-Sep [10] · Pg 138	COMPUTE 75 sec	Medium
PYQ 2026-Jan [56] · Pg 138	COMPUTE 75 sec	Medium
PYQ 2026-Jan [4] · Pg 140	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [9] · Pg 141	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [10] · Pg 141	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [11] · Pg 142	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [10] · Pg 142	COMPUTE 75 sec	Medium
PYQ 2026-May [3] · Pg 144	COMPUTE 75 sec	Medium
PYQ 2026-Sep [31] · Pg 144	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 5 questions Analysis · Level II

- Formulation problems (diet, fertilizer, machines): let x, y be quantities, one inequality per resource with per-unit coefficients, plus $x \geq 0, y \geq 0$; cancel common factors ($400x + 100y \leq 10,000 \rightarrow 4x + y \leq 100$) before matching options.
- Triangle-perimeter type: write all sides in the shortest side x , form the perimeter inequality, solve for minimum x .

PYQ 2023-Jun [10] · Pg 128	SET UP 150 sec	Medium
MTP 2024-Jun S3 [28] · Pg 130 asked 2×	SET UP 150 sec	Medium
PYQ 2024-Sep [35] · Pg 130 asked 2×	SET UP 150 sec	Medium

PYQ 2025-Jan [28] · Pg 133 asked 2×

SET UP
150 sec**Medium**

PYQ 2025-May [10] · Pg 136 asked 2×

SET UP
150 sec**Medium**

CHAPTER 4

Mathematics of Finance

8 Topics · 301 Classified Questions · Importance: A

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 79 sec a question on average — **about the pace of the paper**

RECALL Remembering	1.2%	30 sec	3 of 242 past-exam questions
RECOGNISE Understanding	1.7%	45 sec	4 of 242 past-exam questions
COMPUTE Application	90.5%	75 sec	219 of 242 past-exam questions
SET UP Analysis	6.6%	150 sec	16 of 242 past-exam questions

Topic 1: Simple Interest

P3-C4-U4-T01

Read first Study Section 4.4.1 (Simple Interest) along with the basic definitions in 4.3 — interest, principal, rate of interest and accumulated amount — and work through the solved examples on finding any one of P , i , t from the others.

COMPUTE 75 sec one formula, straight through · 37 questions Application · Level II

- Core formulas: $I = P \cdot i \cdot t$ (i = rate in decimal), $A = P(1 + it)$; rearrange for any missing variable, e.g. $i = I/(P \cdot t)$.
- Two loans, one total interest: $P1 \cdot i \cdot t1 + P2 \cdot i \cdot t2 = \text{total}$; solve for the common rate i .
- Borrow-and-relend gain per year = $P(r2 - r1)/100$; doubling shortcut: money doubles when $rt = 100$, triples when $rt = 200$ (double in 10 yrs means triple in 20 yrs).
- Convert months to year-fractions (3 years 3 months = 3.25) before using $A = P(1 + it)$.

PYQ 2018-May [15] · Pg 147	COMPUTE 75 sec	Easy
PYQ 2018-Nov [10] · Pg 149	COMPUTE 75 sec	Easy
PYQ 2019-Jun [14] · Pg 153	COMPUTE 75 sec	Easy
PYQ 2019-Nov [12] · Pg 155	COMPUTE 75 sec	Easy
PYQ 2019-Nov [17] · Pg 155	COMPUTE 75 sec	Easy
PYQ 2021-Dec [17] · Pg 159	COMPUTE 75 sec	Easy
PYQ 2021-Dec [20] · Pg 159	COMPUTE	Easy

	75 sec	
PYQ 2022-Jun [13] · Pg 160	COMPUTE 75 sec	Easy
PYQ 2023-Dec [13] · Pg 162 asked 2×	COMPUTE 75 sec	Easy
PYQ 2023-Dec [21] · Pg 162	COMPUTE 75 sec	Easy
PYQ 2024-Jun [20] · Pg 162	COMPUTE 75 sec	Easy
PYQ 2024-Sep [42] · Pg 164	COMPUTE 75 sec	Easy
PYQ 2025-Jan [44] · Pg 165 asked 2×	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [16] · Pg 166	COMPUTE 75 sec	Easy
PYQ 2025-Sep [16] · Pg 167	COMPUTE 75 sec	Easy
PYQ 2026-Jan [60] · Pg 168	COMPUTE 75 sec	Easy
PYQ 2018-May [16] · Pg 148	COMPUTE 75 sec	Medium
PYQ 2018-Nov [13] · Pg 150	COMPUTE 75 sec	Medium
PYQ 2019-Jun [11] · Pg 152	COMPUTE 75 sec	Medium
PYQ 2019-Jun [12] · Pg 153	COMPUTE 75 sec	Medium
PYQ 2019-Nov [11] · Pg 154	COMPUTE 75 sec	Medium
PYQ 2021-Jan [13] · Pg 157	COMPUTE 75 sec	Medium
PYQ 2021-Jan [14] · Pg 157	COMPUTE 75 sec	Medium
PYQ 2022-Dec [13] · Pg 160	COMPUTE 75 sec	Medium
PYQ 2023-Jun [19] · Pg 161	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [14] · Pg 163	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [16] · Pg 163	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [13] · Pg 164	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [14] · Pg 164	COMPUTE 75 sec	Medium
PYQ 2025-Jan [35] · Pg 165 asked 2×	COMPUTE	Medium

	75 sec	
MTP 2025-Jan S2 [15] · Pg 166	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [24] · Pg 168	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [20] · Pg 169	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [21] · Pg 169	COMPUTE 75 sec	Medium
PYQ 2026-May [63] · Pg 169	COMPUTE 75 sec	Medium
PYQ 2026-May [61] · Pg 170	COMPUTE 75 sec	Medium
RTP 2026-May [4] · Pg 170	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 10 questions · Analysis · Level II

- Equal-interest division: shares are inversely proportional to time — divide the corpus in ratio $1/t_1 : 1/t_2 : 1/t_3$.
- Mixed-condition problems: extract r and t from a side condition first (roots of $x^2 - 11x + 30 = 0$ give $t = 5$, $r = 6$), then use $I = P.r.t/100$.
- 'Interest added to principal every k years': step the principal up block by block at SI until the target amount is reached.

PYQ 2018-May [14] · Pg 146	SET UP 150 sec	Medium
PYQ 2018-Nov [15] · Pg 151	SET UP 150 sec	Medium
PYQ 2019-Jun [20] · Pg 153 asked 2×	SET UP 150 sec	Medium
PYQ 2021-Jan [9] · Pg 156	SET UP 150 sec	Medium
PYQ 2021-Jul [20] · Pg 158	SET UP 150 sec	Medium
MTP 2024-Aug S2 [15] · Pg 163	SET UP 150 sec	Medium
PYQ 2026-Jan [61] · Pg 167	SET UP 150 sec	Medium
PYQ 2020-Nov [22] · Pg 156	SET UP 150 sec	Hard
MTP 2024-Aug S2 [17] · Pg 164	SET UP 150 sec	Hard
PYQ 2025-May [11] · Pg 166	SET UP 150 sec	Hard

Topic 2: Compound Interest

P3-C4-U4-T02

Read first Study Sections 4.4.2 to 4.4.4 — compound interest, conversion period and the CI formula — noting how rate and periods change with compounding frequency, plus the annuity definitions in 4.6 which some MCQs draw on.

RECALL 30 sec know it or move on · 1 question Remembering · Level I

- $A = P(1 + i)^n$ where i = annual rate / conversions per year, n = total conversion periods; $CI = A - P$; effective rate $E = (1 + i)^n - 1$.
- Conversions per year: annually 1, semi-annually 2, quarterly 4, monthly 12.
- Annuity regular = payment at end of each period; annuity due/immediate = payment at the beginning.

PYQ 2021-Jan [19] · Pg 180

RECALL
30 sec

Easy

RECOGNISE 45 sec decide which idea applies · 2 questions Understanding · Level I

- PV and FV of an annuity due exceed those of an ordinary annuity; $FV(\text{due}) = FV(\text{ordinary}) \times (1 + i)$ — options test these relations.
- More frequent compounding at the same nominal rate gives a larger amount; per-period rate shrinks ($i/2$, $i/4$, $i/12$) while periods multiply.

PYQ 2020-Nov [15] · Pg 178

RECOGNISE
45 sec

Easy

PYQ 2020-Nov [18] · Pg 179

RECOGNISE
45 sec

Easy

COMPUTE 75 sec one formula, straight through · 77 questions Application · Level II

- Find P from A : $P = A/(1 + i)^n$ with i , n adjusted for frequency (4% semi-annual for 1 year: $i = 0.02$, $n = 2$); use supplied powers like $(1.02)^8 = 1.171659$ directly.
- CI - SI for 2 years = $P(r/100)^2$ — back out P or r (difference ₹30 at 5% gives $P = ₹12,000$).
- Given CI, use $CI = P[(1 + i)^n - 1]$; doubling/time questions: solve $(1 + i)^n = A/P$ by matching given powers.

PYQ 2018-Nov [8] · Pg 171

COMPUTE
75 sec

Easy

PYQ 2018-Nov [9] · Pg 171

COMPUTE
75 sec

Easy

PYQ 2018-Nov [11] · Pg 172

COMPUTE
75 sec

Easy

PYQ 2018-Nov [12] · Pg 172

COMPUTE

Easy

	75 sec	
PYQ 2018-Nov [17] · Pg 173	COMPUTE 75 sec	Easy
PYQ 2018-Nov [19] · Pg 174	COMPUTE 75 sec	Easy
PYQ 2019-Jun [18] · Pg 176 asked 2×	COMPUTE 75 sec	Easy
PYQ 2019-Nov [15] · Pg 176 asked 2×	COMPUTE 75 sec	Easy
PYQ 2021-Jan [10] · Pg 179 asked 2×	COMPUTE 75 sec	Easy
PYQ 2021-Jan [11] · Pg 180 asked 2×	COMPUTE 75 sec	Easy
PYQ 2021-Jul [10] · Pg 180	COMPUTE 75 sec	Easy
PYQ 2021-Dec [19] · Pg 183	COMPUTE 75 sec	Easy
PYQ 2022-Dec [20] · Pg 186	COMPUTE 75 sec	Easy
PYQ 2022-Dec [23] · Pg 188	COMPUTE 75 sec	Easy
PYQ 2023-Jun [16] · Pg 189	COMPUTE 75 sec	Easy
PYQ 2023-Dec [14] · Pg 190	COMPUTE 75 sec	Easy
PYQ 2023-Dec [20] · Pg 191	COMPUTE 75 sec	Easy
PYQ 2023-Dec [22] · Pg 192	COMPUTE 75 sec	Easy
PYQ 2024-Jun [15] · Pg 193	COMPUTE 75 sec	Easy
PYQ 2024-Jun [16] · Pg 193	COMPUTE 75 sec	Easy
PYQ 2024-Jun [17] · Pg 194	COMPUTE 75 sec	Easy
PYQ 2024-Sep [43] · Pg 199	COMPUTE 75 sec	Easy
PYQ 2024-Sep [45] · Pg 200	COMPUTE 75 sec	Easy
PYQ 2025-Jan [37] · Pg 203 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-Jan [41] · Pg 203 asked 2×	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [21] · Pg 205	COMPUTE 75 sec	Easy
PYQ 2025-May [15] · Pg 206	COMPUTE	Easy

	75 sec	
PYQ 2025-May [18] · Pg 207	COMPUTE 75 sec	Easy
PYQ 2025-Sep [11] · Pg 208	COMPUTE 75 sec	Easy
PYQ 2025-Sep [20] · Pg 209	COMPUTE 75 sec	Easy
PYQ 2025-Sep [21] · Pg 211	COMPUTE 75 sec	Easy
PYQ 2026-Jan [8] · Pg 213	COMPUTE 75 sec	Easy
PYQ 2026-Jan [7] · Pg 214	COMPUTE 75 sec	Easy
PYQ 2026-May [9] · Pg 217	COMPUTE 75 sec	Easy
PYQ 2018-Nov [14] · Pg 174	COMPUTE 75 sec	Medium
PYQ 2019-Jun [13] · Pg 175	COMPUTE 75 sec	Medium
PYQ 2020-Nov [11] · Pg 177	COMPUTE 75 sec	Medium
PYQ 2020-Nov [13] · Pg 178	COMPUTE 75 sec	Medium
PYQ 2021-Jul [12] · Pg 181	COMPUTE 75 sec	Medium
PYQ 2021-Jul [15] · Pg 181	COMPUTE 75 sec	Medium
PYQ 2021-Jul [23] · Pg 182	COMPUTE 75 sec	Medium
PYQ 2021-Dec [21] · Pg 184	COMPUTE 75 sec	Medium
PYQ 2022-Dec [12] · Pg 184	COMPUTE 75 sec	Medium
PYQ 2022-Dec [16] · Pg 185	COMPUTE 75 sec	Medium
PYQ 2023-Jun [14] · Pg 189	COMPUTE 75 sec	Medium
PYQ 2023-Jun [22] · Pg 190 asked 2×	COMPUTE 75 sec	Medium
PYQ 2023-Dec [19] · Pg 191	COMPUTE 75 sec	Medium
PYQ 2024-Jun [22] · Pg 194	COMPUTE 75 sec	Medium
PYQ 2024-Jun [21] · Pg 195	COMPUTE 75 sec	Medium
PYQ 2024-Jun [23] · Pg 196	COMPUTE	Medium

	75 sec	
PYQ 2024-Jun [24] · Pg 196	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [30] · Pg 197	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [39] · Pg 198	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [40] · Pg 198	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [18] · Pg 198	COMPUTE 75 sec	Medium
PYQ 2024-Sep [41] · Pg 198	COMPUTE 75 sec	Medium
PYQ 2024-Sep [46] · Pg 200	COMPUTE 75 sec	Medium
RTP 2024-Sep [7] · Pg 201 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [15] · Pg 202 asked 3×	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [16] · Pg 202 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [22] · Pg 202	COMPUTE 75 sec	Medium
PYQ 2025-Jan [32] · Pg 202 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-Jan [42] · Pg 204 asked 2×	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [17] · Pg 205	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [25] · Pg 206 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-May [14] · Pg 206	COMPUTE 75 sec	Medium
PYQ 2025-Sep [17] · Pg 208	COMPUTE 75 sec	Medium
PYQ 2025-Sep [22] · Pg 209	COMPUTE 75 sec	Medium
PYQ 2026-Jan [58] · Pg 211	COMPUTE 75 sec	Medium
PYQ 2026-Jan [5] · Pg 214	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [23] · Pg 215	COMPUTE 75 sec	Medium
PYQ 2026-May [59] · Pg 215	COMPUTE 75 sec	Medium
PYQ 2026-May [10] · Pg 216	COMPUTE	Medium

	75 sec	
PYQ 2026-May [64] · Pg 218	COMPUTE 75 sec	Medium
PYQ 2026-Sep [1] · Pg 220	COMPUTE 75 sec	Medium
PYQ 2026-Sep [2] · Pg 220	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [24] · Pg 205	COMPUTE 75 sec	Hard

SET UP 150 sec set it up before you compute · 7 questions · Analysis · Level II

- Amounts at two dates: $A_4/A_2 = (1+i)^2$ — divide to isolate the rate, then work back to P.
- Two-scheme investments: x at r1, (S - x) at r2; equate total interest and solve the linear equation.
- Equal-amount splits (A's sum after 7 yrs = B's after 9 yrs): shares in ratio $(1+i)^9 : (1+i)^7$; SI-to-CI bridges: extract r from the SI clause (60% in 6 years gives $r = 10\%$), then compute CI.

PYQ 2020-Nov [12] · Pg 177	SET UP 150 sec	Medium
PYQ 2022-Dec [19] · Pg 187	SET UP 150 sec	Medium
PYQ 2025-May [12] · Pg 207	SET UP 150 sec	Medium
PYQ 2026-Jan [59] · Pg 212	SET UP 150 sec	Medium
MTP 2024-Aug S2 [21] · Pg 198	SET UP 150 sec	Hard
MTP 2025-Jan S2 [20] · Pg 205	SET UP 150 sec	Hard
MTP 2025-Jan S2 [22] · Pg 205	SET UP 150 sec	Hard

Topic 3: Depreciation

P3-C4-U4-T03

Read first Study the depreciation applications of the compound interest formula in Section 4.4 (reducing-balance method) — the solved examples on scrap value and on finding the original cost or the time to reach a given value.

COMPUTE 75 sec one formula, straight through · 15 questions · Application · Level II

- Depreciated/scrap value after n years: $A = P(1-i)^n$ where i = depreciation rate in decimal; work powers of $(1-i)$ step by step on the calculator.
- Original value before n years: $P = A/(1-i)^n$ (e.g. present value ₹7,290 at 10% for 3 years gives $P = 7,290/0.9^3 = ₹10,000$).

- Time to reach a target value: solve $(1 - i)^n = A/P$ by repeated multiplication or logs; interpolate for fractional years (answers like '5 years 6 months').
- Keep depreciation distinct from CI: use $(1 - i)$, never $(1 + i)$, and remember the value keeps decreasing geometrically.

PYQ 2023-Dec [18] · Pg 223	COMPUTE 75 sec	Easy
PYQ 2019-Nov [16] · Pg 220 asked 2×	COMPUTE 75 sec	Medium
PYQ 2019-Nov [18] · Pg 221	COMPUTE 75 sec	Medium
PYQ 2019-Nov [20] · Pg 222 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [35] · Pg 224	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [36] · Pg 224	COMPUTE 75 sec	Medium
PYQ 2024-Sep [39] · Pg 224	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [19] · Pg 225 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-Sep [13] · Pg 225	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [23] · Pg 226	COMPUTE 75 sec	Medium
RTP 2025-Jan [15] · Pg 226	COMPUTE 75 sec	Medium
PYQ 2026-May [8] · Pg 227	COMPUTE 75 sec	Medium
PYQ 2026-Sep [58] · Pg 227	COMPUTE 75 sec	Medium
PYQ 2022-Dec [11] · Pg 222	COMPUTE 75 sec	Hard
PYQ 2023-Jun [18] · Pg 223	COMPUTE 75 sec	Hard

Topic 4: Difference Between Compound Interest and Simple Interest

P3-C4-U4-T04

Read first Study the CI vs SI comparison built from Sections 4.4.1 and 4.4.2; memorise the ready 2-year and 3-year difference formulas used in nearly every MCQ of this type.

RECALL 30 sec know it or move on · 1 question Remembering · Level I

- For 2 years: $CI - SI = P(r/100)^2$, i.e. $P \times r^2$ with r in decimal.

- For 3 years: $CI - SI = P(r/100)^2 \times (3 + r/100)$.
- SI grows linearly ($I = P \cdot r \cdot t / 100$) while CI compounds; they are equal for the first year (annual compounding).

PYQ 2024-Jun [19] · Pg 231

RECALL
30 sec

Easy

COMPUTE 75 sec one formula, straight through · 13 questions Application · Level II

- Given P, r, t compute both interests and subtract; for 4 years compute $CI = P[(1+i)^4 - 1]$ and $SI = 4Pi$ directly.
- Given the difference for 2 years, back out $P = \text{difference} / (r/100)^2$ (e.g. ₹372 at 10% gives $P = 372 / 0.01 = ₹37,200$) or $r = 100 \times \sqrt{\text{difference}/P}$.
- For fractional periods or non-annual compounding, adjust i and n first, then subtract SI computed on the same total time.

PYQ 2018-Nov [16] · Pg 228

COMPUTE
75 sec

Easy

PYQ 2019-Nov [19] · Pg 228

COMPUTE
75 sec

Easy

PYQ 2022-Dec [21] · Pg 230

COMPUTE
75 sec

Easy

PYQ 2024-Sep [44] · Pg 232

COMPUTE
75 sec

Easy

PYQ 2025-Sep [12] · Pg 232

COMPUTE
75 sec

Easy

PYQ 2021-Jul [21] · Pg 229

COMPUTE
75 sec

Medium

PYQ 2023-Jun [21] · Pg 230

COMPUTE
75 sec

Medium

MTP 2024-Jun S3 [29] · Pg 231 asked 2x

COMPUTE
75 sec

Medium

MTP 2024-Aug S2 [19] · Pg 231

COMPUTE
75 sec

Medium

MTP 2024-Dec S1 [17] · Pg 232

COMPUTE
75 sec

Medium

PYQ 2025-Sep [15] · Pg 233

COMPUTE
75 sec

Medium

PYQ 2026-May [6] · Pg 233

COMPUTE
75 sec

Medium

PYQ 2026-Sep [4] · Pg 234

COMPUTE
75 sec

Medium

Topic 5: Effective Rate of Interest

P3-C4-U4-T05

Read first Study the Effective Rate of Interest section (with formula $E = (1 + i)^n - 1$ and $I = PEt$) including Examples 22-23 and the comparison of a compound rate with an equivalent simple rate.

RECOGNISE 45 sec decide which idea applies · 2 questions Understanding · Level I

- Effective rate depends only on the nominal rate and the number of conversion periods — NOT on the amount of principal (a repeated MCQ).
- If compounding frequency > 1 , effective rate $>$ nominal rate; they are equal only for annual compounding.
- Effective rate is the equivalent annual simple-interest rate that produces the same interest in one year ($I = PEt$).

MTP 2024-Dec S1 [20] · Pg 242 asked 4×

RECOGNISE

45 sec

Easy

PYQ 2025-May [19] · Pg 243

RECOGNISE

45 sec

Easy

COMPUTE 75 sec one formula, straight through · 19 questions Application · Level II

- $E = (1 + i)^n - 1$ with i = nominal/conversions, n = conversions per year: 5% half-yearly gives $(1.025)^2 - 1 = 5.06\%$; 10% quarterly gives $(1.025)^4 - 1 = 10.38\%$; 7% monthly gives about 7.22%.
- Successive different rates: $A = P(1 + i_1)(1 + i_2)\dots$ (e.g. ₹25,000 $\times 1.04 \times 1.05 = ₹27,300$).
- Calculator drill: build $(1 + i)^n$ by repeated 'x =' presses, then subtract 1 and convert to %.

PYQ 2018-Nov [18] · Pg 234 asked 2×

COMPUTE

75 sec

Easy

PYQ 2019-Nov [13] · Pg 235

COMPUTE

75 sec

Easy

PYQ 2023-Dec [12] · Pg 240

COMPUTE

75 sec

Easy

PYQ 2024-Jun [18] · Pg 241

COMPUTE

75 sec

Easy

PYQ 2024-Sep [40] · Pg 241

COMPUTE

75 sec

Easy

PYQ 2025-Jan [38] · Pg 242 asked 2×

COMPUTE

75 sec

Easy

RTP 2025-Jan [6] · Pg 243

COMPUTE

75 sec

Easy

PYQ 2025-May [13] · Pg 243 asked 2×

COMPUTE

75 sec

Easy

PYQ 2025-Sep [18] · Pg 244

COMPUTE

Easy

	75 sec	
PYQ 2026-May [11] · Pg 245	COMPUTE 75 sec	Easy
PYQ 2026-Sep [3] · Pg 245	COMPUTE 75 sec	Easy
PYQ 2019-Nov [14] · Pg 235 asked 2×	COMPUTE 75 sec	Medium
PYQ 2021-Jan [15] · Pg 238	COMPUTE 75 sec	Medium
PYQ 2021-Jul [11] · Pg 238	COMPUTE 75 sec	Medium
PYQ 2022-Jun [16] · Pg 238 asked 2×	COMPUTE 75 sec	Medium
PYQ 2023-Jun [11] · Pg 239	COMPUTE 75 sec	Medium
PYQ 2024-Jun [14] · Pg 240	COMPUTE 75 sec	Medium
PYQ 2026-Jan [6] · Pg 244	COMPUTE 75 sec	Medium
PYQ 2020-Nov [21] · Pg 236	COMPUTE 75 sec	Hard

SET UP 150 sec set it up before you compute · 1 question · Analysis · Level II

- Blended-portfolio problems: capital C split in fractions at different rates — form $C(f_1r_1 + f_2r_2 + f_3r_3)/100$ = income and solve for C (find the remainder fraction first).
- Comparison problems: convert every option to its effective annual rate before choosing the better investment.

PYQ 2021-Jan [16] · Pg 237

SET UP
150 sec

Medium

Topic 6: Future Value of Annuity

P3-C4-U4-T06

Read first Study Sections 4.6 (annuity, annuity regular vs annuity due) and 4.7 (future value of annuity regular and of annuity due), plus the sinking fund application $A = P.A(n, i)$.

RECALL 30 sec know it or move on · 2 questions · Remembering · Level I

- FV of ordinary annuity: $A(n, i) = A \times [(1 + i)^n - 1]/i$; for annuity due multiply this by $(1 + i)$.
- Sinking fund factor is the reciprocal of the future value interest factor of an annuity (FVIFA).
- FV of a single sum: $F = P(1 + i)^n$ (needed together with the annuity factor in mixed questions).

PYQ 2022-Dec [24] · Pg 257	RECALL 30 sec	Easy
MTP 2024-Jun S3 [33] · Pg 260	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 1 question Understanding · Level I

- Annuity due = payments at the beginning of each period; its FV = ordinary FV $\times (1 + i)$ — pick the option showing the extra $(1 + i)$ factor.
- PV of annuity immediate = annuity regular for $(n - 1)$ years plus the initial receipt at the start.
- An annuity needs equal amounts at equal intervals; irregular amounts or gaps do not qualify.

PYQ 2021-Jan [20] · Pg 249	RECOGNISE 45 sec	Easy
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COMPUTE 75 sec one formula, straight through · 42 questions Application · Level II

- Direct FV: instalment $\times$ factor ($\text{₹}1,500 \times [(1.1)^5 - 1]/0.1 = \text{₹}9,157.65$ using $(1.1)^5 = 1.61051$).
- Sinking fund / target corpus: instalment = target / $A(n, i)$ ($\text{₹}7,96,870/15.9374 = \text{₹}50,000$).
- Annuity due FV: ordinary FV $\times (1 + i)$; monthly deposits use $i = \text{annual}/12$, $n = \text{months}$.

PYQ 2020-Nov [14] · Pg 248	COMPUTE 75 sec	Easy
PYQ 2020-Nov [16] · Pg 248	COMPUTE 75 sec	Easy
PYQ 2021-Dec [16] · Pg 250	COMPUTE 75 sec	Easy
PYQ 2022-Dec [14] · Pg 254	COMPUTE 75 sec	Easy
PYQ 2022-Dec [18] · Pg 255	COMPUTE 75 sec	Easy
PYQ 2022-Dec [22] · Pg 256	COMPUTE 75 sec	Easy
PYQ 2023-Jun [20] · Pg 257	COMPUTE 75 sec	Easy
PYQ 2023-Dec [9] · Pg 258	COMPUTE 75 sec	Easy
PYQ 2023-Dec [15] · Pg 259 asked 2×	COMPUTE 75 sec	Easy
PYQ 2026-Jan [54] · Pg 269	COMPUTE 75 sec	Easy
PYQ 2018-May [12] · Pg 246 asked 2×	COMPUTE 75 sec	Medium
PYQ 2018-May [13] · Pg 246	COMPUTE 75 sec	Medium
PYQ 2019-Jun [17] · Pg 247	COMPUTE	Medium

	75 sec	
PYQ 2021-Jan [12] · Pg 249	COMPUTE 75 sec	Medium
PYQ 2021-Jul [22] · Pg 250	COMPUTE 75 sec	Medium
PYQ 2021-Dec [18] · Pg 251	COMPUTE 75 sec	Medium
PYQ 2022-Jun [12] · Pg 252 asked 2×	COMPUTE 75 sec	Medium
PYQ 2022-Jun [15] · Pg 252	COMPUTE 75 sec	Medium
PYQ 2022-Jun [18] · Pg 253	COMPUTE 75 sec	Medium
PYQ 2022-Dec [17] · Pg 254	COMPUTE 75 sec	Medium
PYQ 2023-Jun [17] · Pg 257	COMPUTE 75 sec	Medium
PYQ 2023-Dec [10] · Pg 259	COMPUTE 75 sec	Medium
PYQ 2024-Jun [13] · Pg 260	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [28] · Pg 261	COMPUTE 75 sec	Medium
PYQ 2024-Sep [48] · Pg 261	COMPUTE 75 sec	Medium
PYQ 2024-Sep [50] · Pg 262	COMPUTE 75 sec	Medium
RTP 2024-Sep [9] · Pg 263 asked 3×	COMPUTE 75 sec	Medium
PYQ 2025-Jan [39] · Pg 263	COMPUTE 75 sec	Medium
PYQ 2025-Jan [40] · Pg 263 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-Jan [48] · Pg 264 asked 2×	COMPUTE 75 sec	Medium
RTP 2025-Jan [5] · Pg 265 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-May [17] · Pg 265	COMPUTE 75 sec	Medium
PYQ 2025-May [23] · Pg 265	COMPUTE 75 sec	Medium
PYQ 2025-May [21] · Pg 266	COMPUTE 75 sec	Medium
PYQ 2025-Sep [14] · Pg 267	COMPUTE 75 sec	Medium
PYQ 2026-Jan [57] · Pg 268	COMPUTE	Medium

	75 sec	
MTP 2026-Apr S1 [15] · Pg 269	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [22] · Pg 269	COMPUTE 75 sec	Medium
PYQ 2026-May [62] · Pg 269	COMPUTE 75 sec	Medium
PYQ 2026-May [7] · Pg 270	COMPUTE 75 sec	Medium
PYQ 2026-Sep [5] · Pg 271	COMPUTE 75 sec	Medium
PYQ 2026-Sep [57] · Pg 271	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute — no question in this edition Analysis · Level II

- 'Amount one year after the 12th deposit': take the 12-payment annuity FV, then grow it one more year by $(1 + i)$.
- Machine-replacement problems: FV needed = future cost minus scrap proceeds; fix the target first, then divide by $A(n, i)$.
- Deferred/split streams: value each block at its own date, then shift to the common date with $(1 + i)^k$.

Topic 7: Present Value of Annuity

P3-C4-U4-T07

Read first Study Section 4.8 (present value of annuity regular and annuity due) and the applications in 4.10 — leasing, capital expenditure/NPV and valuation of bonds — including instalment-of-a-loan examples.

RECOGNISE 45 sec decide which idea applies — no question in this edition Understanding · Level I

- $P(n, i) = [(1 + i)^n - 1] / [i(1 + i)^n]$ is the PV factor; PV of annuity due = PV of ordinary annuity $\times (1 + i)$.
- NPV decision rule: NPV ≥ 0 means accept the proposal; NPV < 0 means reject.
- PV moves inversely with the discount rate; a higher i means a smaller present value.

COMPUTE 75 sec one formula, straight through · 30 questions Application · Level II

- PV of an annuity: $V = A \times P(n, i)$; PV of a single future sum: $V = A / (1 + i)^n$ using supplied powers (e.g. $(1.06)^{10} = 1.79085$ type data).
- Equal instalments of a loan: instalment = loan / $P(n, i)$; total interest = (instalment $\times n$) - loan.
- Half-yearly instalment plans: use i = annual rate/2 and n = number of half-years before applying the factor.

PYQ 2023-Dec [17] · Pg 279	COMPUTE 75 sec	Easy
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PYQ 2024-Jun [11] · Pg 280	COMPUTE 75 sec	Easy
MTP 2024-Aug S2 [27] · Pg 280	COMPUTE 75 sec	Easy
PYQ 2026-May [67] · Pg 289	COMPUTE 75 sec	Easy
PYQ 2020-Nov [20] · Pg 273	COMPUTE 75 sec	Medium
PYQ 2021-Jul [19] · Pg 274	COMPUTE 75 sec	Medium
PYQ 2021-Jul [16] · Pg 274	COMPUTE 75 sec	Medium
PYQ 2021-Dec [22] · Pg 275	COMPUTE 75 sec	Medium
PYQ 2022-Jun [11] · Pg 275 asked 2×	COMPUTE 75 sec	Medium
PYQ 2022-Jun [14] · Pg 276	COMPUTE 75 sec	Medium
PYQ 2023-Jun [12] · Pg 277	COMPUTE 75 sec	Medium
PYQ 2023-Jun [23] · Pg 278	COMPUTE 75 sec	Medium
PYQ 2024-Sep [52] · Pg 280	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [23] · Pg 281 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-Jan [36] · Pg 281 asked 2×	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [18] · Pg 282	COMPUTE 75 sec	Medium
PYQ 2025-Jan [45] · Pg 283 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-May [16] · Pg 283	COMPUTE 75 sec	Medium
PYQ 2025-May [22] · Pg 284	COMPUTE 75 sec	Medium
PYQ 2026-Jan [55] · Pg 285	COMPUTE 75 sec	Medium
PYQ 2026-Jan [11] · Pg 286	COMPUTE 75 sec	Medium
PYQ 2026-Jan [10] · Pg 286	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [21] · Pg 287	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [22] · Pg 287	COMPUTE 75 sec	Medium

PYQ 2026-May [60] · Pg 288	COMPUTE 75 sec	Medium
RTP 2026-May [7] · Pg 290	COMPUTE 75 sec	Medium
PYQ 2026-Sep [32] · Pg 290	COMPUTE 75 sec	Medium
PYQ 2026-Sep [34] · Pg 290	COMPUTE 75 sec	Medium
PYQ 2026-Sep [56] · Pg 290	COMPUTE 75 sec	Medium
PYQ 2020-Nov [19] · Pg 272	COMPUTE 75 sec	Hard

SET UP 150 sec set it up before you compute · 3 questions · Analysis · Level II

- Leasing: compare the asset cost with the PV of rentals at the given rate — if PV of rentals > cost, the lease is favourable to the lessor (Section 4.10.1 pattern).
- Lease vs buy / two options: compute the PV of each cash-flow stream at the borrowing rate and choose the cheaper.
- House/loan balance problems: instalment stream must have PV equal to the balance financed; set balance = instalment $\times P(n, i)$ and solve for the instalment.

PYQ 2019-Jun [16] · Pg 272	SET UP 150 sec	Medium
PYQ 2022-Jun [20] · Pg 277	SET UP 150 sec	Medium
PYQ 2023-Dec [11] · Pg 279	SET UP 150 sec	Medium

Topic 8: Perpetuity; Nominal Rate of Interest; Compounded Annual Growth Rate

P3-C4-U4-T08

Read first Study Section 4.11 (perpetuity: multi-period and growing perpetuity), the Nominal vs Real rate discussion (Fisher relation) and the CAGR section with its formula and applications.

RECALL 30 sec know it or move on · 1 question · Remembering · Level I

- PV of perpetuity = R/i (payment per period / rate per period); PV of growing perpetuity = $R/(i - g)$.
- Nominal rate of return = Real rate of return + Inflation (so Real = Nominal - Inflation).
- $CAGR(t_0, t_n) = (V(t_n)/V(t_0))^{1/(t_n - t_0)} - 1$, the smoothed annualised growth rate.

MTP 2024-Jun S3 [37] · Pg 299	RECALL 30 sec	Easy
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RECOGNISE 45 sec explain with reasons · 1 question Understanding · Level I

MTP 2024-Jun S3 [38] · Pg 299

RECOGNISE
45 sec

Easy

COMPUTE 75 sec one formula, straight through · 36 questions Application · Level II

- Monthly perpetuity: match periods — ₹50,000 per month at 12% p.a. uses $i = 0.01$, $PV = 50,000/0.01 = ₹50,00,000$.
- Growing perpetuity: $PV = R/(i - g)$ (e.g. $280/(0.14 - 0.09) = ₹5,600$).
- Real-growth projections: real rate = nominal - inflation, then multiply P by $(1 + \text{real})^n$ for the projected value.
- CAGR: divide end value by start value, take the $(1/\text{years})^{\text{th}}$ root (via given data or options), subtract 1.

PYQ 2019-Jun [19] · Pg 291

COMPUTE
75 sec

Easy

PYQ 2021-Jul [13] · Pg 293

COMPUTE
75 sec

Easy

PYQ 2022-Jun [17] · Pg 294 asked 3×

COMPUTE
75 sec

Easy

PYQ 2023-Jun [13] · Pg 296

COMPUTE
75 sec

Easy

PYQ 2024-Jun [12] · Pg 298

COMPUTE
75 sec

Easy

MTP 2024-Jun S3 [34] · Pg 298

COMPUTE
75 sec

Easy

PYQ 2024-Sep [47] · Pg 299 asked 2×

COMPUTE
75 sec

Easy

PYQ 2024-Sep [49] · Pg 300

COMPUTE
75 sec

Easy

PYQ 2025-Jan [43] · Pg 302 asked 2×

COMPUTE
75 sec

Easy

PYQ 2025-Jan [49] · Pg 303 asked 2×

COMPUTE
75 sec

Easy

PYQ 2025-Jan [50] · Pg 303 asked 2×

COMPUTE
75 sec

Easy

MTP 2025-Jan S2 [26] · Pg 304

COMPUTE
75 sec

Easy

PYQ 2025-Sep [23] · Pg 305

COMPUTE
75 sec

Easy

PYQ 2025-Sep [24] · Pg 305

COMPUTE
75 sec

Easy

PYQ 2026-Sep [33] · Pg 307

COMPUTE
75 sec

Easy

PYQ 2026-Sep [79] · Pg 308

COMPUTE
75 sec

Easy

PYQ 2026-Sep [80] · Pg 308	COMPUTE 75 sec	Easy
PYQ 2026-Sep [81] · Pg 308	COMPUTE 75 sec	Easy
PYQ 2021-Jul [14] · Pg 293 asked 2×	COMPUTE 75 sec	Medium
PYQ 2021-Jul [17] · Pg 293	COMPUTE 75 sec	Medium
PYQ 2021-Jul [18] · Pg 294	COMPUTE 75 sec	Medium
PYQ 2022-Jun [19] · Pg 295	COMPUTE 75 sec	Medium
PYQ 2023-Jun [15] · Pg 296	COMPUTE 75 sec	Medium
PYQ 2023-Jun [24] · Pg 297	COMPUTE 75 sec	Medium
PYQ 2023-Dec [16] · Pg 297 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [25] · Pg 299	COMPUTE 75 sec	Medium
RTP 2024-Sep [6] · Pg 301	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [24] · Pg 301 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [25] · Pg 302 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [26] · Pg 302	COMPUTE 75 sec	Medium
PYQ 2025-May [20] · Pg 304	COMPUTE 75 sec	Medium
PYQ 2025-Sep [19] · Pg 304	COMPUTE 75 sec	Medium
PYQ 2026-May [65] · Pg 307	COMPUTE 75 sec	Medium
PYQ 2021-Jan [17] · Pg 291	COMPUTE 75 sec	Hard
PYQ 2024-Sep [51] · Pg 300	COMPUTE 75 sec	Hard
PYQ 2026-Jan [9] · Pg 306	COMPUTE 75 sec	Hard

CHAPTER 5

Basic Concepts of Permutations and Combinations

6 Topics · 111 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 79 sec a question on average — **about the pace of the paper**

RECOGNISE Understanding	1.2%	45 sec	1 of 84 past-exam questions
COMPUTE Application	92.9%	75 sec	78 of 84 past-exam questions
SET UP Analysis	6.0%	150 sec	5 of 84 past-exam questions

Topic 1: The Factorial

P3-C5-U5-T01

Read first Study the Factorial definition at the start of the chapter ($n! = n(n-1)(n-2)\dots 2 \cdot 1$ with $0! = 1$) and the fundamental principles of counting (multiplication and addition rules) that everything else builds on.

COMPUTE 75 sec one formula, straight through · 5 questions Application · Level II

- Simplify factorial equations by pulling out common factors: $1/9! + 1/10! = x/11!$ becomes $x = 11 \cdot 10 + 11 = 121$ after multiplying through by $11!$.
- Use $n! = n \cdot (n-1)!$ repeatedly to cancel factorials in ratios before solving for n or N .
- Remember $0! = 1$ and that factorials of small numbers (up to $10! = 36,28,800$) are worth memorising for speed.

PYQ 2018-Nov [23] · Pg 310	COMPUTE 75 sec	Medium
PYQ 2018-Nov [24] · Pg 311	COMPUTE 75 sec	Medium
PYQ 2022-Jun [23] · Pg 311	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [28] · Pg 312	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [29] · Pg 312	COMPUTE 75 sec	Medium

Topic 2: Permutation

P3-C5-U5-T02

Read first Study the Permutations section: nPr as ordered arrangements, the theorem $nPr = n!/(n-r)!$

$r)! = n(n-1)\dots(n-r+1)$, $nPn = n!$, and the worked examples on solving equations in nPr .

RECOGNISE 45 sec decide which idea applies · 1 question Understanding · Level I

- Permutation = arrangement where ORDER matters (photos in a row, prizes, seat allotments); this distinguishes it from combination.
- Key properties MCQs test: $nPn = nPn-1$, $nPr = n \cdot (n-1)P(r-1)$, and $nPr = (n-r+1) \cdot nP(r-1)$.
- nPr is defined only for $0 \leq r \leq n$ with n a positive integer — reject fractional/negative roots when solving.

PYQ 2019-Jun [21] · Pg 312

RECOGNISE
45 sec

Easy

COMPUTE 75 sec one formula, straight through · 27 questions Application · Level II

- Direct counting: r objects into n positions is nPr (e.g. 4 persons in 9 seats = $9P4 = 3,024$).
- Equations in nPr : expand as products, cancel, and solve — $nP4 = 20 \cdot nP2$ gives $(n-2)(n-3) = 20$, so $n = 7$.
- Ratio problems like $nP3 : nP2 = 2 : 1$ or $nP13 : (n+1)P12$: write both in product form, cancel common factors, solve the resulting linear/quadratic and discard invalid roots.

PYQ 2019-Nov [25] · Pg 313

COMPUTE
75 sec

Easy

PYQ 2021-Dec [25] · Pg 314

COMPUTE
75 sec

Easy

PYQ 2023-Dec [25] · Pg 314

COMPUTE
75 sec

Easy

MTP 2024-Jun S3 [16] · Pg 315

COMPUTE
75 sec

Easy

MTP 2024-Jun S3 [17] · Pg 315

COMPUTE
75 sec

Easy

MTP 2024-Jun S3 [21] · Pg 316

COMPUTE
75 sec

Easy

MTP 2024-Aug S2 [31] · Pg 316

COMPUTE
75 sec

Easy

MTP 2025-Jan S2 [30] · Pg 321

COMPUTE
75 sec

Easy

PYQ 2020-Nov [25] · Pg 313

COMPUTE
75 sec

Medium

PYQ 2021-Jul [24] · Pg 313

COMPUTE
75 sec

Medium

MTP 2024-Jun S3 [19] · Pg 315

COMPUTE
75 sec

Medium

MTP 2024-Aug S2 [30] · Pg 316

COMPUTE
75 sec

Medium

MTP 2024-Aug S2 [32] · Pg 316	COMPUTE 75 sec	Medium
RTP 2024-Sep [5] · Pg 317 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [29] · Pg 317 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [30] · Pg 317	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [31] · Pg 317 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-May [27] · Pg 318	COMPUTE 75 sec	Medium
PYQ 2025-May [25] · Pg 318	COMPUTE 75 sec	Medium
PYQ 2025-Sep [27] · Pg 319	COMPUTE 75 sec	Medium
PYQ 2025-Sep [28] · Pg 319	COMPUTE 75 sec	Medium
PYQ 2025-Sep [26] · Pg 320	COMPUTE 75 sec	Medium
PYQ 2025-Sep [25] · Pg 321	COMPUTE 75 sec	Medium
RTP 2025-Jan [8] · Pg 321	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [27] · Pg 321	COMPUTE 75 sec	Medium
PYQ 2026-Sep [6] · Pg 322	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [20] · Pg 315	COMPUTE 75 sec	Hard

SET UP 150 sec break down and compare · 2 questions Analysis · Level II

MTP 2024-Jun S3 [58] · Pg 316	SET UP 150 sec	Medium
MTP 2024-Dec S1 [28] · Pg 317	SET UP 150 sec	Medium

Topic 3: Circular Permutations

P3-C5-U5-T03

Read first Study the Circular Permutations section: why n linear arrangements collapse to one circular arrangement, giving $(n-1)!$, and the necklace/garland case $(1/2)(n-1)!$ where clockwise and anticlockwise are alike.

COMPUTE 75 sec one formula, straight through · 1 question Application · Level II

- n distinct people around a round table: $(n-1)!$ ways; for necklaces/garlands halve it: $(1/2)(n-1)!$.
- Alternating-seats pattern: seat one group around the circle in $(n-1)!$ ways, then place the other group in the n gaps in $n!$ ways (4 men and 4 women, no two women adjacent: $3! \times 4! = 144$; 5 Indians and 5 Americans: $4! \times 5!$).
- Fixed-neighbour conditions (tallest always right of shortest): tie the pair into one unit, arrange $(n-1)$ units in a circle as $(n-2)!$ (5 persons gives $3! = 6$).

PYQ 2026-May [66] · Pg 322

COMPUTE
75 sec**Medium**

Topic 4: Permutation with Restrictions

P3-C5-U5-T04

Read first Study the Permutations with Restrictions section: theorems for a particular object excluded ($(n-1)P_r$) or always included ($r \cdot n \cdot 1P_{(r-1)}$), and the worked examples on letters together/never together, books by subject, and digit-formation problems.

COMPUTE 75 sec one formula, straight through · 23 questions Application · Level II

- Objects that must stay together: bundle them as one unit — arrange units, then arrange within the bundle (3+3+5 books by subject: $3! \times 3! \times 3! \times 5!$; DRAUGHT vowels together: $2! \times 6!$).
- 'Never together': total arrangements minus 'together' arrangements (n books, two particular never together: $n! - 2 \cdot (n-1)! = (n-2) \cdot (n-1)!$).
- No two girls together: arrange the boys first, then place girls in the gaps (5 boys, 3 girls: $5! \times 6P_3 = 14,400$); vowels only in odd positions (DETAIL): choose odd slots for the 3 vowels ($3P_3$) $\times$ arrange consonants ($3!$) = 36.
- Digit problems: count choices position by position with the fundamental principle — 4-digit numbers from 6 digits without repetition = $6P_4 = 360$; watch bans on 0 in the leading place.

PYQ 2024-Jun [28] · Pg 327

COMPUTE
75 sec**Easy**

PYQ 2026-Jan [65] · Pg 328

COMPUTE
75 sec**Easy**

PYQ 2019-Nov [21] · Pg 323

COMPUTE
75 sec**Medium**

PYQ 2021-Jul [27] · Pg 323

COMPUTE
75 sec**Medium**

PYQ 2021-Dec [26] · Pg 324 asked 2x

COMPUTE
75 sec**Medium**

PYQ 2021-Dec [27] · Pg 325

COMPUTE
75 sec**Medium**

PYQ 2022-Jun [25] · Pg 325	COMPUTE 75 sec	Medium
PYQ 2023-Jun [28] · Pg 325	COMPUTE 75 sec	Medium
PYQ 2023-Dec [23] · Pg 326	COMPUTE 75 sec	Medium
PYQ 2024-Jun [25] · Pg 326	COMPUTE 75 sec	Medium
PYQ 2024-Jun [26] · Pg 327	COMPUTE 75 sec	Medium
PYQ 2024-Jun [27] · Pg 327	COMPUTE 75 sec	Medium
PYQ 2024-Sep [55] · Pg 328	COMPUTE 75 sec	Medium
PYQ 2025-Jan [46] · Pg 328 asked 2×	COMPUTE 75 sec	Medium
PYQ 2026-Jan [64] · Pg 329	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [30] · Pg 330	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [25] · Pg 330	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [27] · Pg 330	COMPUTE 75 sec	Medium
PYQ 2026-May [12] · Pg 330	COMPUTE 75 sec	Medium
RTP 2026-May [11] · Pg 331	COMPUTE 75 sec	Medium
PYQ 2026-Sep [7] · Pg 331	COMPUTE 75 sec	Medium
PYQ 2026-Sep [9] · Pg 331	COMPUTE 75 sec	Medium
PYQ 2026-Sep [10] · Pg 331	COMPUTE 75 sec	Medium

Topic 5: Combinations

P3-C5-U5-T05

Read first Study the Combinations section: $nCr = n!/(r!(n-r)!)$ as selections where order does not matter, the link $nPr = r! \times nCr$, and properties $nCr = nC(n-r)$ and $(n+1)Cr = nCr + nCr-1$ with their solved examples.

COMPUTE 75 sec one formula, straight through · 33 questions Application · Level II

- Direct selections: handshakes among 40 guests = $40C2 = 780$; triangles from 12 points with 7 collinear = $12C3 - 7C3 = 185$.

- Pascal-type telescoping: $10C3 + 2 \cdot 10C4 + 10C5 = 12C5$ (apply $nCr + nCr-1 = (n+1)Cr$ twice); $1000C98 = 999C97 + 999C98$ identifies $x = 999$.
- Given $nPr = 720$ and $nCr = 120$, use $r! = nPr/nCr = 6$, so $r = 3$.
- Use $nCr = nC(n-r)$ to shrink computation and to equate indices ($nCx = nCy$ means $x = y$ or $x + y = n$).

PYQ 2019-Jun [22] · Pg 333	COMPUTE 75 sec	Easy
PYQ 2019-Nov [23] · Pg 334	COMPUTE 75 sec	Easy
PYQ 2020-Nov [23] · Pg 335	COMPUTE 75 sec	Easy
PYQ 2021-Jan [27] · Pg 337	COMPUTE 75 sec	Easy
PYQ 2021-Jul [26] · Pg 338	COMPUTE 75 sec	Easy
PYQ 2022-Jun [21] · Pg 339	COMPUTE 75 sec	Easy
PYQ 2022-Jun [26] · Pg 339	COMPUTE 75 sec	Easy
PYQ 2022-Dec [28] · Pg 342	COMPUTE 75 sec	Easy
PYQ 2023-Dec [24] · Pg 343 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-May [28] · Pg 344	COMPUTE 75 sec	Easy
PYQ 2026-May [68] · Pg 347	COMPUTE 75 sec	Easy
PYQ 2018-May [18] · Pg 332 asked 2×	COMPUTE 75 sec	Medium
PYQ 2018-May [19] · Pg 332	COMPUTE 75 sec	Medium
PYQ 2019-Nov [22] · Pg 334	COMPUTE 75 sec	Medium
PYQ 2019-Nov [24] · Pg 335	COMPUTE 75 sec	Medium
PYQ 2021-Jan [21] · Pg 335	COMPUTE 75 sec	Medium
PYQ 2021-Jan [26] · Pg 336	COMPUTE 75 sec	Medium
PYQ 2021-Jul [25] · Pg 337	COMPUTE 75 sec	Medium
PYQ 2021-Dec [23] · Pg 338	COMPUTE 75 sec	Medium
PYQ 2021-Dec [24] · Pg 338	COMPUTE 75 sec	Medium

PYQ 2022-Jun [22] · Pg 339	COMPUTE 75 sec	Medium
PYQ 2022-Jun [28] · Pg 340 asked 2×	COMPUTE 75 sec	Medium
PYQ 2022-Dec [25] · Pg 340	COMPUTE 75 sec	Medium
PYQ 2022-Dec [26] · Pg 341	COMPUTE 75 sec	Medium
PYQ 2022-Dec [27] · Pg 341	COMPUTE 75 sec	Medium
PYQ 2024-Sep [57] · Pg 343 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [22] · Pg 343	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [33] · Pg 343	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [34] · Pg 344	COMPUTE 75 sec	Medium
PYQ 2026-Jan [62] · Pg 344	COMPUTE 75 sec	Medium
PYQ 2026-Jan [63] · Pg 345	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [28] · Pg 346	COMPUTE 75 sec	Medium
PYQ 2026-May [69] · Pg 346	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 3 questions Analysis · Level II

- Ratio conditions like $(n+1)C(r+1) : nCr : (n-1)C(r-1) = 8 : 3 : 1$ — convert each ratio to a linear equation via $nCr/(n-1)C(r-1) = n/r$, then solve the pair simultaneously.
- Split-role selections (boat crew: 3 fixed stroke side, 2 fixed other side): choose the free people for each side, then multiply by arrangements within each side ($4! \times 4!$ within sides).
- Conditional selections (Maths-II only with Maths-I): partition into cases — with the pair and without it — count each case and add.
- Digit-formation with parity/zero restrictions: multiply choices for the constrained positions first (units digit odd, leading digit nonzero), then the rest.

PYQ 2021-Jan [24] · Pg 336	SET UP 150 sec	Medium
PYQ 2019-Jun [23] · Pg 333	SET UP 150 sec	Hard
PYQ 2023-Jun [25] · Pg 342	SET UP 150 sec	Hard

Topic 6: Standard Results

P3-C5-U5-T06

Read first Study the Standard Results section at the end of the chapter: permutations of things not all different $n!/(n_1!n_2!...)$, total selections $2^n - 1$ from n distinct things, $(n_1+1)(n_2+1)... - 1$ for alike things, and the 'at least one' committee examples.

RECALL 30 sec know it or move on — no question in this edition Remembering · Level I

- $nC_0 + nC_1 + ... + nC_n = 2^n$, so $nC_1 + nC_2 + ... + nC_n = 2^n - 1$ (selections taking at least one thing).
- Arrangements of n things where $n_1, n_2, ...$ are alike: $n!/(n_1! n_2! n_3!...)$.
- Selections from groups of alike things: $(n_1 + 1)(n_2 + 1)(n_3 + 1)... - 1$.

COMPUTE 75 sec one formula, straight through · 14 questions Application · Level II

- Words with repeated letters: ALLAHABAD = $9!/(4! 2!) = 7,560$; add a restriction (B, H never together) by total minus together (BHARAT: $6!/2! - 2 \times 5!/2! = 240$).
- 'At least one' selections: complement — total minus none (team of 5 from 7 boys and 4 girls with at least one girl: $11C_5 - 7C_5 = 441$; 3 balls with at least one black: $9C_3 - 6C_3 = 64$).
- Geometry counts: parallelograms from 6 and 4 parallel lines = $6C_2 \times 4C_2 = 90$; drill diagonals-of-polygon $nC_2 - n$.

PYQ 2021-Jan [23] · Pg 350	COMPUTE 75 sec	Easy
PYQ 2025-Jan [56] · Pg 353	COMPUTE 75 sec	Easy
PYQ 2018-Nov [21] · Pg 347	COMPUTE 75 sec	Medium
PYQ 2018-Nov [22] · Pg 348	COMPUTE 75 sec	Medium
PYQ 2020-Nov [24] · Pg 348	COMPUTE 75 sec	Medium
PYQ 2020-Nov [26] · Pg 349	COMPUTE 75 sec	Medium
PYQ 2022-Jun [24] · Pg 350	COMPUTE 75 sec	Medium
PYQ 2022-Jun [27] · Pg 351	COMPUTE 75 sec	Medium
PYQ 2024-Sep [53] · Pg 352	COMPUTE 75 sec	Medium
PYQ 2024-Sep [56] · Pg 352	COMPUTE 75 sec	Medium
PYQ 2025-Jan [53] · Pg 353	COMPUTE 75 sec	Medium

PYQ 2025-Jan [59] · Pg 353	COMPUTE 75 sec	Medium
PYQ 2025-Jan [65] · Pg 354	COMPUTE 75 sec	Medium
PYQ 2025-May [26] · Pg 354	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 2 questions · Analysis · Level II

- Incompatible-member committees: split into cases (Kajal in/Yash out, Yash in/Kajal out, both out), count each with combinations and add.
- Round-robin totals: matches per group = $6C2$ each, then add later-round matches stage by stage.
- Lock-and-key trials and family-counting puzzles: model the worst case or list members systematically (draw the tree) before counting.

PYQ 2023-Jun [26] · Pg 351	SET UP 150 sec	Medium
PYQ 2021-Jan [22] · Pg 349	SET UP 150 sec	Hard

CHAPTER 6

Sequence and Series - Arithmetic and Geometric Progressions

3 Topics · 88 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 76 sec a question on average — **about the pace of the paper**

RECOGNISE Understanding	2.9%	45 sec	2 of 70 past-exam questions
COMPUTE Application	94.3%	75 sec	66 of 70 past-exam questions
SET UP Analysis	2.9%	150 sec	2 of 70 past-exam questions

Topic 1: Arithmetic Progression

P3-C6-U6-T01

Read first Study the sections on Sequence, Series and Arithmetic Progression in Chapter 6 (Sequence and Series) of the ICAI Study Material: definition of an A.P., nth term, sum of n terms, arithmetic mean, and inserting arithmetic means between two numbers.

COMPUTE 75 sec one formula, straight through · 47 questions Application · Level II

- Drill $tn = a + (n-1)d$ and $Sn = n/2[2a + (n-1)d] = n/2(\text{first} + \text{last})$; most questions are direct substitution once a, d, n are identified.
- Given two terms (6th = 38, 10th = 66), subtract the term equations for d , back-solve a ; for 'pth term = q , qth term = p ' the r th term = $p + q - r$ and the $(p+q)$ th term = 0.
- x, y, z are in A.P. iff $2y = x + z$ — use for 'find x so $x+1, 3x, 4x+2$ are in A.P.'; take three unknown numbers as $a-d, a, a+d$ so the sum fixes a .
- If Sn is a polynomial ($3n^2 + 5n$), then $tn = Sn - S(n-1)$, $a = S1$; for divisibility sums find first term, last term, $n = (l-a)/d + 1$, then $Sn = n/2(a+l)$.

PYQ 2018-May [21] · Pg 358	COMPUTE 75 sec	Easy
PYQ 2018-Nov [28] · Pg 360	COMPUTE 75 sec	Easy
PYQ 2021-Jul [30] · Pg 365 asked 2×	COMPUTE 75 sec	Easy
PYQ 2021-Dec [29] · Pg 366	COMPUTE 75 sec	Easy
PYQ 2021-Dec [30] · Pg 366	COMPUTE	Easy

	75 sec	
MTP 2024-Jun S3 [5] · Pg 374	COMPUTE 75 sec	Easy
MTP 2024-Aug S2 [35] · Pg 374	COMPUTE 75 sec	Easy
MTP 2024-Dec S1 [33] · Pg 376	COMPUTE 75 sec	Easy
MTP 2024-Dec S1 [35] · Pg 376	COMPUTE 75 sec	Easy
PYQ 2025-Jan [51] · Pg 378	COMPUTE 75 sec	Easy
PYQ 2025-Jan [52] · Pg 378	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [33] · Pg 378	COMPUTE 75 sec	Easy
PYQ 2025-May [31] · Pg 379	COMPUTE 75 sec	Easy
PYQ 2025-Sep [29] · Pg 380	COMPUTE 75 sec	Easy
PYQ 2026-May [15] · Pg 381	COMPUTE 75 sec	Easy
PYQ 2026-May [14] · Pg 382	COMPUTE 75 sec	Easy
PYQ 2018-Nov [25] · Pg 359	COMPUTE 75 sec	Medium
PYQ 2018-Nov [27] · Pg 359	COMPUTE 75 sec	Medium
PYQ 2019-Jun [26] · Pg 362	COMPUTE 75 sec	Medium
PYQ 2019-Nov [29] · Pg 363	COMPUTE 75 sec	Medium
PYQ 2020-Nov [28] · Pg 363	COMPUTE 75 sec	Medium
PYQ 2020-Nov [29] · Pg 364	COMPUTE 75 sec	Medium
PYQ 2021-Jul [29] · Pg 365	COMPUTE 75 sec	Medium
PYQ 2022-Jun [29] · Pg 366	COMPUTE 75 sec	Medium
PYQ 2022-Dec [29] · Pg 368	COMPUTE 75 sec	Medium
PYQ 2023-Jun [29] · Pg 368	COMPUTE 75 sec	Medium
PYQ 2023-Jun [30] · Pg 369	COMPUTE 75 sec	Medium
PYQ 2023-Dec [26] · Pg 370	COMPUTE	Medium

	75 sec	
PYQ 2023-Dec [27] · Pg 370	COMPUTE 75 sec	Medium
PYQ 2023-Dec [29] · Pg 371	COMPUTE 75 sec	Medium
PYQ 2024-Jun [30] · Pg 372	COMPUTE 75 sec	Medium
PYQ 2024-Jun [31] · Pg 373	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [3] · Pg 374	COMPUTE 75 sec	Medium
PYQ 2024-Sep [60] · Pg 374	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [34] · Pg 376	COMPUTE 75 sec	Medium
PYQ 2024-Sep [62] · Pg 377	COMPUTE 75 sec	Medium
PYQ 2025-Jan [47] · Pg 377	COMPUTE 75 sec	Medium
PYQ 2025-May [29] · Pg 379	COMPUTE 75 sec	Medium
PYQ 2025-Sep [31] · Pg 380	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [34] · Pg 381	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [29] · Pg 381	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [30] · Pg 381	COMPUTE 75 sec	Medium
PYQ 2026-Sep [8] · Pg 382	COMPUTE 75 sec	Medium
PYQ 2019-Jun [24] · Pg 361	COMPUTE 75 sec	Hard
PYQ 2022-Jun [31] · Pg 367 asked 2×	COMPUTE 75 sec	Hard
PYQ 2024-Jun [29] · Pg 372	COMPUTE 75 sec	Hard
MTP 2024-Dec S1 [32] · Pg 375	COMPUTE 75 sec	Hard

SET UP 150 sec set it up before you compute · 2 questions Analysis · Level II

- Mixed A.P.-G.P. problems: write the A.P. numbers as $a-d, a, a+d$, fix a from the sum, then impose $\text{middle}^2 = \text{product of extremes}$ on the modified numbers to get d .
- Installment problems: first installment = a , 'each less by ₹5' means $d = -5$; set $S_n = \text{total}$ and solve the quadratic in n , rejecting inadmissible roots.

PYQ 2024-Sep [61] · Pg 376

SET UP
150 sec**Medium**

MTP 2025-Jan S2 [32] · Pg 378

SET UP
150 sec**Medium**

Topic 2: Geometric Progression

P3-C6-U6-T02

Read first Read the Geometric Progression sections of Chapter 6: nth term, sum of n terms, sum to infinity, geometric mean, and the A.M.-G.M. relationship.

RECOGNISE 45 sec decide which idea applies · 2 questions Understanding · Level I

- Equal spacing keeps G.P. status: if the 4th, 7th, 10th terms are p, q, r then $q^2 = pr$.
- Know A.P./G.P./H.P. links options exploit: $1/a, 1/b, 1/c$ in A.P. means a, b, c in H.P.; logs of a G.P. form an A.P. (so $a^{(1/x)} = b^{(1/y)} = c^{(1/z)}$ with a, b, c in G.P. puts x, y, z in A.P.).

PYQ 2019-Nov [26] · Pg 384

RECOGNISE
45 sec**Easy**

PYQ 2023-Jun [31] · Pg 397

RECOGNISE
45 sec**Easy**

COMPUTE 75 sec one formula, straight through · 32 questions Application · Level II

- Core formulas: $tn = ar^{(n-1)}$, $Sn = a(r^n - 1)/(r - 1)$, $S(\infty) = a/(1-r)$ for $|r| < 1$; given two terms, divide their equations to get r.
- Three numbers in G.P.: take $a/r, a, ar$ — the product gives a directly, the sum then gives r.
- A.M. = 6.5, G.M. = 6 means $a + b = 13$, $ab = 36$: solve $x^2 - 13x + 36 = 0$; consecutive G.P. terms satisfy $b^2 = ac$.
- Infinite-sum pairs: solve $a/(1-r) = S$ with $ar = t^2$; ratios like $S_{20} = 1025 S_{10}$ factor via $r^{10} + 1$.

PYQ 2019-Jun [27] · Pg 384

COMPUTE
75 sec**Easy**

PYQ 2019-Nov [30] · Pg 387

COMPUTE
75 sec**Easy**

MTP 2024-Jun S3 [5] · Pg 398

COMPUTE
75 sec**Easy**

PYQ 2025-Jan [54] · Pg 399

COMPUTE
75 sec**Easy**

PYQ 2026-May [16] · Pg 406

COMPUTE
75 sec**Easy**

PYQ 2018-Nov [26] · Pg 383

COMPUTE
75 sec**Medium**

PYQ 2019-Jun [25] · Pg 383

COMPUTE
75 sec**Medium**

PYQ 2019-Nov [27] · Pg 385	COMPUTE 75 sec	Medium
PYQ 2019-Nov [28] · Pg 386	COMPUTE 75 sec	Medium
PYQ 2019-Nov [31] · Pg 387	COMPUTE 75 sec	Medium
PYQ 2020-Nov [27] · Pg 388	COMPUTE 75 sec	Medium
PYQ 2021-Jan [29] · Pg 389	COMPUTE 75 sec	Medium
PYQ 2021-Dec [28] · Pg 393	COMPUTE 75 sec	Medium
PYQ 2021-Dec [31] · Pg 394	COMPUTE 75 sec	Medium
PYQ 2022-Jun [30] · Pg 395	COMPUTE 75 sec	Medium
PYQ 2022-Dec [30] · Pg 396	COMPUTE 75 sec	Medium
PYQ 2023-Dec [28] · Pg 397	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [6] · Pg 399	COMPUTE 75 sec	Medium
PYQ 2025-Jan [9] · Pg 399	COMPUTE 75 sec	Medium
PYQ 2025-May [30] · Pg 400	COMPUTE 75 sec	Medium
PYQ 2025-Sep [30] · Pg 401	COMPUTE 75 sec	Medium
PYQ 2025-Sep [32] · Pg 402	COMPUTE 75 sec	Medium
PYQ 2026-Jan [68] · Pg 403	COMPUTE 75 sec	Medium
PYQ 2026-Jan [12] · Pg 404	COMPUTE 75 sec	Medium
PYQ 2026-Jan [13] · Pg 405	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [33] · Pg 406	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [35] · Pg 406	COMPUTE 75 sec	Medium
PYQ 2026-May [13] · Pg 407	COMPUTE 75 sec	Medium
RTP 2026-May [13] · Pg 408	COMPUTE 75 sec	Medium
PYQ 2026-Sep [82] · Pg 408	COMPUTE 75 sec	Medium

PYQ 2026-Sep [84] · Pg 408	COMPUTE 75 sec	Medium
PYQ 2026-Sep [85] · Pg 408	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 2 questions · Analysis · Level II

- G.P.-A.P. puzzles: assume a/r , a , ar , use the sum, then turn 'subtract 7, 2, 1 to get an A.P.' into $2(\text{middle}) = \text{sum of extremes}$; solve simultaneously.
- 'x, 8, y in G.P.; x, y, -8 in A.P.': set $xy = 64$ and $2y = x - 8$, reduce to a quadratic, and verify roots against both conditions.

MTP 2025-Jan S2 [31] · Pg 400	SET UP 150 sec	Medium
PYQ 2021-Jul [28] · Pg 390	SET UP 150 sec	Hard

Topic 3: Special Series

P3-C6-U6-T03

Read first Study the Special Series section of Chapter 6: sum of the first n natural numbers, of their squares and cubes, and the use of infinite G.P. to express recurring decimals as fractions.

COMPUTE 75 sec one formula, straight through · 3 questions · Application · Level II

- Memorise: $1+2+\dots+n = n(n+1)/2$; sum of squares $= n(n+1)(2n+1)/6$; sum of cubes $= [n(n+1)/2]^2$ — e.g. $1+2+3+\dots = 55$ gives $n(n+1)/2 = 55$, so $n = 10$.
- Recurring decimals: split $2.353535\dots = 2 + 35/100 + 35/100^2 + \dots$ and sum the infinite G.P. with $r = 1/100$ to get the fraction.
- Grouped series like $1 + (1+3) + (1+3+5) + \dots$: the k th bracket sums to k^2 , so $S_n = \text{sum of squares} = n(n+1)(2n+1)/6$; for series such as $3+7+13+21+\dots$ take differences to spot $tn = n^2 + n + 1$.
- Series like $0.5 + 0.55 + 0.555 + \dots$: write each term as $(5/9)(1 - 10^{-k})$, split into an easy sum minus a G.P.; also recall $tn = S_n - S_{(n-1)}$ when S_n is given ($S_n = 3n^2 - n$ gives first term $S_1 = 2$).

PYQ 2018-May [20] · Pg 409 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-May [32] · Pg 410	COMPUTE 75 sec	Easy
PYQ 2021-Jan [28] · Pg 409	COMPUTE 75 sec	Medium

CHAPTER 7

Sets, Relations and Functions, Basics of Limits and Continuity Functions

9 Topics · 89 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 71 sec a question on average — **about the pace of the paper**

RECALL Remembering	2.8%	30 sec	2 of 72 past-exam questions
RECOGNISE Understanding	18.1%	45 sec	13 of 72 past-exam questions
COMPUTE Application	75.0%	75 sec	54 of 72 past-exam questions
SET UP Analysis	4.2%	150 sec	3 of 72 past-exam questions

Topic 1: Sets

P3-C7-U7-T01

Read first Read Unit 7.1 (Sets) of Chapter 7 in the ICAI Study Material: definition and representation of sets, subsets and proper subsets, power set, types of sets (null, singleton, finite, infinite, equal, equivalent), union, intersection, difference, complement and De Morgan's laws.

RECALL 30 sec know it or move on · 3 questions Remembering · Level I

- n-element set: 2^n subsets, $2^n - 1$ proper subsets (ICAI/Scanner convention), $2^n - 2$ non-empty proper subsets; power set $P(X)$ = set of all subsets including the null set and X .
- De Morgan's laws: $(A \cup B)' = A' \cap B'$; $(A \cap B)' = A' \cup B'$.
- Relation properties: reflexive (aRa), symmetric (aRb implies bRa), transitive (aRb, bRc imply aRc); all three = equivalence relation.

PYQ 2024-Sep [65] · Pg 420

RECALL
30 sec

Easy

MTP 2025-Jan S2 [34] · Pg 421

RECALL
30 sec

Easy

PYQ 2025-Sep [33] · Pg 422

RECALL
30 sec

Easy

RECOGNISE 45 sec decide which idea applies · 2 questions Understanding · Level I

- Classify set types: cubes of natural numbers form an infinite set; equal sets have the same elements, equivalent sets only the same cardinality.
- For a set 'formed by' a word (Allahabad), strip repeated letters first, then apply 2^n .

PYQ 2021-Jan [30] · Pg 416 asked 2×	RECOGNISE 45 sec	Easy
MTP 2024-Aug S2 [22] · Pg 420	RECOGNISE 45 sec	Easy

COMPUTE 75 sec one formula, straight through · 21 questions Application · Level II

- Evaluate $A - B$, $A \cup B$, $A \cap B$ and chained expressions like $(A - B) \cup C$ by careful listing; cardinality questions need only $n(\text{result})$.
- 'Subsets differ by 56' becomes $2^x - 2^y = 56 = 2^3(2^3 - 1)$, so $x = 6$, $y = 3$.
- Counting: $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ and the three-set inclusion-exclusion formula — drill 'only', 'at least one' and 'exactly one' variants.

PYQ 2018-Nov [31] · Pg 414	COMPUTE 75 sec	Easy
PYQ 2019-Jun [28] · Pg 415	COMPUTE 75 sec	Easy
PYQ 2019-Jun [30] · Pg 415	COMPUTE 75 sec	Easy
PYQ 2022-Jun [35] · Pg 417	COMPUTE 75 sec	Easy
PYQ 2022-Dec [31] · Pg 417	COMPUTE 75 sec	Easy
PYQ 2023-Jun [35] · Pg 418	COMPUTE 75 sec	Easy
PYQ 2023-Dec [32] · Pg 419	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [14] · Pg 419 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-Jan [55] · Pg 420	COMPUTE 75 sec	Easy
RTP 2025-Jan [10] · Pg 421 asked 2×	COMPUTE 75 sec	Easy
RTP 2025-Jan [11] · Pg 421	COMPUTE 75 sec	Easy
PYQ 2025-May [34] · Pg 421	COMPUTE 75 sec	Easy
PYQ 2020-Nov [30] · Pg 415	COMPUTE 75 sec	Medium
PYQ 2022-Jun [34] · Pg 416 asked 2×	COMPUTE 75 sec	Medium
PYQ 2022-Jun [36] · Pg 417	COMPUTE 75 sec	Medium
PYQ 2023-Dec [30] · Pg 418	COMPUTE 75 sec	Medium

PYQ 2023-Dec [33] · Pg 419	COMPUTE 75 sec	Medium
PYQ 2025-Jan [60] · Pg 420	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [36] · Pg 421 asked 2x	COMPUTE 75 sec	Medium
RTP 2025-Jan [9] · Pg 421	COMPUTE 75 sec	Medium
PYQ 2026-May [70] · Pg 422	COMPUTE 75 sec	Medium

Topic 2: Venn Diagrams

P3-C7-U7-T02

Read first Study the Euler-Venn diagram portion of Unit 7.1: representing unions, intersections and complements as regions, and using $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ and its three-set version for survey problems.

COMPUTE 75 sec one formula, straight through · 8 questions Application · Level II

- Two-set surveys (Hindi/English speakers, newspapers X and Y): total = $n(A) + n(B) - n(\text{both})$; 'exactly one' = $n(A) + n(B) - 2n(\text{both})$; 'neither' = universal - $n(A \cup B)$.
- Complement counts: $n(A' \cap B') = n(U) - n(A \cup B)$ and $n(A' \cup B') = n(U) - n(A \cap B)$ — pick the right De Morgan form before substituting.
- Divisibility counting (1 to 100 not divisible by 3, 5 or 7): count multiples with $\text{floor}(100/k)$, add back pairwise multiples of LCMs, subtract the triple, then take the complement.
- Percentage overlap questions ('74% like grapes, 68% like bananas, everyone likes at least one'): minimum both = $74 + 68 - 100 = 42\%$.

PYQ 2020-Nov [31] · Pg 424	COMPUTE 75 sec	Easy
PYQ 2023-Jun [33] · Pg 427	COMPUTE 75 sec	Easy
PYQ 2018-May [23] · Pg 423	COMPUTE 75 sec	Medium
PYQ 2021-Jan [33] · Pg 424	COMPUTE 75 sec	Medium
PYQ 2021-Jul [34] · Pg 425	COMPUTE 75 sec	Medium
PYQ 2023-Dec [31] · Pg 427	COMPUTE 75 sec	Medium
PYQ 2024-Sep [66] · Pg 428	COMPUTE 75 sec	Medium
PYQ 2026-Sep [83] · Pg 428	COMPUTE	Medium

75 sec

SET UP 150 sec set it up before you compute · 1 question Analysis · Level II

- Three-set puzzles with 'only' conditions (teachers of Maths/Physics/Chemistry): draw the three-circle diagram, fill from the innermost region (all three) outwards using the 'but not' clauses, then read off the asked region rather than plugging blindly into the formula.

PYQ 2021-Dec [32] · Pg 426

SET UP
150 sec**Medium**

Topic 3: Product Sets

P3-C7-U7-T03

Read first Read the Ordered Pair and Cartesian Product of Sets portion of Unit 7.2: $A \times B$ as the set of ordered pairs (a, b) , $n(A \times B) = n(A) \times n(B)$, and combining products with union/intersection/difference.

COMPUTE 75 sec one formula, straight through · 3 questions Application · Level II

- Form $A \times B$ by pairing every element of A with every element of B in order — (a, b) is not (b, a) ; $n(A \times B) = n(A) \times n(B)$.
- For composite expressions like $A \times (B \cap C)$ or $(A - C) \times B$, evaluate the bracketed set operation first, then take the product; distributive fact: $A \times (B \cap C) = (A \times B) \cap (A \times C)$.
- Relations defined on a product set ($R = \{(x, y) : x + y = 10\}$ on A): list the qualifying pairs, then read off domain and range; domain of R -inverse = range of R .

PYQ 2026-Jan [17] · Pg 429

COMPUTE
75 sec**Easy**

PYQ 2019-Jun [29] · Pg 429

COMPUTE
75 sec**Medium**

MTP 2024-Dec S1 [36] · Pg 429

COMPUTE
75 sec**Medium**

Topic 4: Relations and Functions

P3-C7-U7-T04

Read first Study Unit 7.2 on Relations and Functions: relation as a subset of $A \times B$, when a relation is a function, reflexive/symmetric/transitive/equivalence relations, and composition $f \circ g$ with functional-equation manipulation.

RECOGNISE 45 sec decide which idea applies · 12 questions · Understanding · Level I

- A relation is a function iff every domain element appears exactly once as a first component — repeated first elements (like $(y,2)$ and $(y,3)$) or missing domain elements disqualify.
- Check reflexive/symmetric/transitive pair-by-pair on small listed relations: reflexive needs every (a,a) ; symmetric the reverse of each pair; transitive (a,c) whenever $(a,b), (b,c)$ present.
- Standard verdicts: 'a - b divisible by 5 (or even)' and 'is parallel to' are equivalence relations; 'is perpendicular to' is symmetric only.

PYQ 2019-Jun [32] · Pg 431	RECOGNISE 45 sec	Easy
PYQ 2021-Jul [35] · Pg 433	RECOGNISE 45 sec	Easy
MTP 2024-Jun S3 [15] · Pg 437	RECOGNISE 45 sec	Easy
MTP 2024-Aug S2 [23] · Pg 437	RECOGNISE 45 sec	Easy
PYQ 2021-Jan [31] · Pg 432	RECOGNISE 45 sec	Medium
PYQ 2021-Dec [33] · Pg 434	RECOGNISE 45 sec	Medium
PYQ 2022-Jun [32] · Pg 435	RECOGNISE 45 sec	Medium
PYQ 2023-Jun [34] · Pg 436	RECOGNISE 45 sec	Medium
PYQ 2024-Sep [58] · Pg 438 asked 2x	RECOGNISE 45 sec	Medium
MTP 2024-Dec S1 [37] · Pg 438	RECOGNISE 45 sec	Medium
PYQ 2025-May [33] · Pg 439	RECOGNISE 45 sec	Medium
PYQ 2026-May [71] · Pg 441	RECOGNISE 45 sec	Medium

COMPUTE 75 sec one formula, straight through · 15 questions · Application · Level II

- Composition: $(f \circ g)(x) = f(g(x))$ — substitute the inner function fully, simplify, then evaluate (e.g. $\text{gof}(3)$ for $f(x) = x^2 - 1$, $g(x) = 2x + 3$).
- Number of relations from A to B = $2^{(n(A) \times n(B))}$ (two 2-element sets give 16).
- Functional equations: expand and solve ($4f(x) = f(2x)$ for $f(x) = x^2 + x - 1$); compute recursive definitions like Fibonacci term by term.

PYQ 2018-Nov [30] · Pg 430	COMPUTE 75 sec	Easy
PYQ 2019-Nov [32] · Pg 431	COMPUTE 75 sec	Easy

PYQ 2022-Dec [32] · Pg 435	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [13] · Pg 437 asked 2×	COMPUTE 75 sec	Easy
RTP 2024-Sep [10] · Pg 438 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-Sep [34] · Pg 439	COMPUTE 75 sec	Easy
PYQ 2019-Jun [31] · Pg 430	COMPUTE 75 sec	Medium
PYQ 2021-Jan [32] · Pg 432	COMPUTE 75 sec	Medium
PYQ 2024-Sep [59] · Pg 438	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [35] · Pg 439	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [40] · Pg 440	COMPUTE 75 sec	Medium
PYQ 2026-Jan [69] · Pg 440	COMPUTE 75 sec	Medium
PYQ 2026-Jan [66] · Pg 440	COMPUTE 75 sec	Medium
PYQ 2026-Sep [59] · Pg 443	COMPUTE 75 sec	Medium
PYQ 2026-Sep [86] · Pg 443	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 2 questions Analysis · Level II

- Minimum pairs to make R an equivalence relation: add missing reflexive pairs, then close under symmetry and transitivity, counting each forced addition.
- With several relations R, S, T given, test each property on each separately — one counterexample pair kills a property.

PYQ 2024-Jun [32] · Pg 437	SET UP 150 sec	Medium
PYQ 2023-Jun [32] · Pg 436	SET UP 150 sec	Hard

Topic 5: Domain & Range of a Function

P3-C7-U7-T05

Read first Read the Domain and Range discussion in Unit 7.2: domain as the set of admissible inputs, range as $f(A)$, and finding ranges of rational and quadratic-type expressions.

RECOGNISE 45 sec decide which idea applies · 1 question Understanding · Level I

- Range excludes values the formula can never reach: a rational function like $(3 + x)/(x)$ type expressions misses the value making the equation in x insolvable — e.g. range of such linear rational maps is $\mathbb{R}$ minus one point.
- Know the classic bound: for any positive real x , $x^2 + 1/x^2 \geq 2$ (AM $\geq$ GM), so 'sum of square of a positive quantity and its reciprocal is never less than 2'.

PYQ 2025-May [35] · Pg 444

RECOGNISE
45 sec

Easy

COMPUTE 75 sec one formula, straight through · 2 questions Application · Level II

- For a listed function $f : A \rightarrow B$, the range is just the set of actual images $\{f(a)\}$ — do not confuse it with the co-domain B ($f(x) = x^2$ on $\{1,2,3,4\}$ has range $\{1,4,9,16\}$).
- To find the range of $y = f(x)$, solve for x in terms of y and keep the y -values for which x exists (and is in the domain); for square-root/bounded forms like $\sqrt{16 - x^2}$, read off the interval $[0, 4]$.

PYQ 2018-Nov [29] · Pg 443

COMPUTE
75 sec

Easy

PYQ 2021-Jul [31] · Pg 443

COMPUTE
75 sec

Medium

Topic 6: Various Types of Functions

P3-C7-U7-T06

Read first Study the classification of functions in Unit 7.2: one-one (injective), onto (surjective), bijective, identity and constant functions, composite functions, and the inverse function which exists only for one-one onto maps.

RECOGNISE 45 sec decide which idea applies · 2 questions Understanding · Level I

- One-one: distinct inputs give distinct outputs (check $f(x_1) = f(x_2)$ implies $x_1 = x_2$); onto: range = co-domain; the same rule can change status with the sets — $f(x) = 2x$ is one-one onto from $\mathbb{N}$ to $\mathbb{E}$ (evens) but one-one into from $\mathbb{R}$ to $\mathbb{R}$ only if co-domain is all of $\mathbb{R}$ (it is onto $\mathbb{R}$).
- An identity function maps every element to itself; a constant function sends everything to one value (range is a singleton); a set of ordered pairs with a repeated first element is not a function at all.

PYQ 2018-May [22] · Pg 444

RECOGNISE
45 sec

Easy

PYQ 2018-Nov [32] · Pg 445

RECOGNISE
45 sec

Easy

COMPUTE 75 sec one formula, straight through · 9 questions Application · Level II

- Inverse-finding routine: set $y = f(x)$, solve for x in terms of y , then swap letters — e.g. $f(x) = 100x$ gives $f^{-1}(x) = x/100$; $f(x) = x^2 + 3$ gives $f^{-1}(12) = 3$ (take the admissible root).
- Composite evaluation both ways: $f \circ g(x)$ vs $g \circ f(x)$ are generally different — compute the inner image first ($f(x) = x + 2$, $g(x) = 7^x$ gives $g \circ f(x) = 7^{x+2} = 49(7^x)$).
- For rational functions like $f(x) = (x - a)/(x - b)$, practice the solve-and-swap inverse and verify by composing back to x ; use given point values (f^{-1} of a number) to shortcut via $f(x) = \text{value}$.

PYQ 2019-Nov [33] · Pg 445	COMPUTE 75 sec	Easy
PYQ 2022-Jun [33] · Pg 448	COMPUTE 75 sec	Easy
PYQ 2026-May [72] · Pg 451	COMPUTE 75 sec	Easy
PYQ 2021-Jul [32] · Pg 446	COMPUTE 75 sec	Medium
PYQ 2021-Jul [33] · Pg 447	COMPUTE 75 sec	Medium
PYQ 2021-Dec [34] · Pg 447	COMPUTE 75 sec	Medium
PYQ 2023-Jun [36] · Pg 449	COMPUTE 75 sec	Medium
PYQ 2025-Sep [35] · Pg 449	COMPUTE 75 sec	Medium
PYQ 2025-Sep [36] · Pg 450	COMPUTE 75 sec	Medium

Topic 7: Concept of Limit

P3-C7-U7-T07

Read first Read Section 7.7 (Concept of Limit): the idea of x tending to a , left- and right-hand limits, and evaluating limits by factorisation, rationalisation and standard algebraic simplification.

COMPUTE 75 sec one formula, straight through · 6 questions Application · Level II

- 0/0 forms: factorise numerator and denominator, cancel the common factor $(x - a)$, then substitute — the standard result $\lim (x^n - a^n)/(x - a) = n a^{n-1}$ covers many Scanner items.
- Limits at infinity of rational expressions: divide numerator and denominator by the highest power of x ; the limit is the ratio of leading coefficients (or 0 / infinity by degree comparison).
- Know the exponential limits: $\lim (1 + 1/n)^n = e$ and $\lim (1 + x)^{1/x} = e$ as x tends to 0, including variants that give powers of e .
- Series-based limits like $0.7 + 0.07 + \dots$ to n terms: sum the G.P. first, i.e. $(7/9)(1 - 10^{-n})$, then take the limit if asked.

MTP 2024-Aug S2 [36] · Pg 452	COMPUTE 75 sec	Medium
PYQ 2025-Jan [58] · Pg 452	COMPUTE 75 sec	Medium
PYQ 2025-May [36] · Pg 452	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [38] · Pg 453	COMPUTE 75 sec	Medium
PYQ 2026-May [73] · Pg 453	COMPUTE 75 sec	Medium
PYQ 2026-Sep [61] · Pg 454	COMPUTE 75 sec	Medium

Topic 8: Useful Rules of Limits

P3-C7-U7-T08

Read first Study Section 7.8 (Useful Rules/Theorems on Limits): limit of a sum, difference, product and quotient, and the list of Some Important Limits including $(e^x - 1)/x$, $(a^x - 1)/x$ and $\log(1 + x)/x$.

COMPUTE 75 sec one formula, straight through · 1 question Application · Level II

- Memorise and apply the standard forms: $\lim_{x \rightarrow 0} (e^x - 1)/x = 1$, $(a^x - 1)/x = \log a$ (natural log), $\log(1 + x)/x = 1$ — combine them with the algebra-of-limits rules (limit of product = product of limits) to evaluate composite expressions.

PYQ 2024-Jun [33] · Pg 454	COMPUTE 75 sec	Medium
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Topic 9: Continuity

P3-C7-U7-T09

Read first Read Section 7.9 (Continuity): f is continuous at $x = a$ when the left-hand limit, right-hand limit and $f(a)$ all exist and are equal, and how to assign a value at a point of non-definition to make a function continuous.

COMPUTE 75 sec one formula, straight through · 1 question Application · Level II

- To make f continuous where it is undefined (e.g. at $x = 5$ or $x = 1$), compute $\lim f(x)$ at that point — usually by cancelling the $(x - a)$ factor of a $0/0$ form — and set $f(a)$ equal to that limit.
- For piecewise definitions with a constant k at $x = a$, equate k to the limiting value of the formula as x tends to a and solve for k (answers like $3a^2$ come from $(x^3 + a^3)/(x + a)$ -type simplification).
- Checklist for continuity at a point: $f(a)$ defined, limit exists (LHL = RHL), and $\lim = f(a)$ — any failure means discontinuity.

PYQ 2026-Jan [67] · Pg 455

COMPUTE
75 sec**Medium**

CHAPTER 8

Basic Applications of Differential and Integral Calculus in Business and Economics

15 Topics · 102 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 75 sec a question on average — about the pace of the paper

COMPUTE Application**100.0%**

75 sec

84 of 84 past-exam questions

Topic 1: Derivative or Differential Coefficient

P3-C8-U8-T01

Read first Read the opening section of Chapter 8 on differentiation: the definition of the derivative from first principle, $f'(x) = \lim_{h \rightarrow 0} [f(x+h) - f(x)]/h$, and the worked first-principle derivations of x^n , e^x , a^x , $\sqrt{x}$ and $\log x$.

COMPUTE 75 sec one formula, straight through · 4 questions Application · Level II

- Drill direct differentiation of polynomials and e^kx : expand/simplify first (e.g. $f(x) = (x-1)(x^2+x+1) = x^3 - 1$, so $f'(x) = 3x^2$), then apply $d/dx(x^n) = nx^{n-1}$.
- $d/dx(e^{ax}) = a e^{ax}$ — for $f(x) = e^{(3x)}$, $f'(x) = 3e^{(3x)}$; this one-liner is asked repeatedly.
- For $xy = 1$ type relations, write $y = 1/x$ and differentiate: $dy/dx = -1/x^2 = -y^2$; alternatively differentiate implicitly.
- For dy/dx at a stated point (e.g. $x^y \cdot y^x = 16$ at $(2,2)$), take logs, differentiate implicitly, then substitute the coordinates at the end — do not solve generally.

PYQ 2024-Jun [39] · Pg 460

COMPUTE
75 sec**Easy**

PYQ 2018-Nov [36] · Pg 459

COMPUTE
75 sec**Medium**

PYQ 2024-Jun [37] · Pg 459

COMPUTE
75 sec**Medium**

PYQ 2024-Sep [67] · Pg 460

COMPUTE
75 sec**Medium**

Topic 2: Some Standard Results (Formulas)

P3-C8-U8-T02

Read first Study the two tables in the Study Material: 'Few functions and their derivatives' (x^n ,

e^{ax} , $\log x$, a^x , constant) and 'Basic Laws for differentiation' (scalar multiple, sum/difference, product rule, quotient rule, chain rule).

COMPUTE 75 sec one formula, straight through · 4 questions Application · Level II

- Product rule: $d(uv)/dx = u v' + v u'$. Drill on $e^x \log x$ giving $e^x(1/x + \log x)$ and on $x^n \cdot e^x$ combinations.
- Quotient rule: $d(u/v)/dx = (v u' - u v')/v^2$. Standard exam item: $y = x^4/e^x$ gives $dy/dx = x^3(4 - x)/e^x$.
- For $y = x^x$ use logarithmic differentiation: $\log y = x \log x$, so $dy/dx = x^x(1 + \log x)$ — memorise this result outright.
- Mixed integrals also appear here: $\int (2x+5)^7 dx = (2x+5)^8/16 + c$ by the $(ax+b)^n$ rule — divide by $(n+1)$ and by the coefficient of x .

PYQ 2019-Nov [38] · Pg 461

COMPUTE
75 sec

Medium

PYQ 2021-Dec [36] · Pg 462 asked 2x

COMPUTE
75 sec

Medium

PYQ 2022-Jun [40] · Pg 462

COMPUTE
75 sec

Medium

PYQ 2025-Jan [64] · Pg 463

COMPUTE
75 sec

Medium

Topic 3: Derivative of a Function of Function

P3-C8-U8-T03

Read first Learn the chain rule section: for $y = f\{g(x)\}$, $dy/dx = f'(u) \cdot g'(x)$ with $u = g(x)$, as in the worked example $d/dx \log(1 + x^2) = 2x/(1 + x^2)$.

COMPUTE 75 sec one formula, straight through · 8 questions Application · Level II

- Chain rule drill: differentiate the outer function, keep the inner intact, multiply by the inner's derivative — e.g. $d/dx e^{(x^2)} = 2x e^{(x^2)}$, $d/dx \log(1+x^2) = 2x/(1+x^2)$.
- For $(x+1)^{(x+1)}$ type powers, take logs first: $\log y = (x+1)\log(x+1)$, so $y' = (x+1)^{(x+1)}[1 + \log(x+1)]$; at $x = 0$ this gives $f'(0) = 1$.
- Expression questions like $f''(x) - 2x f'(x) + f(0) - f'(0)$ for $f(x) = e^{(x^2)}$: compute each derivative with the chain rule, substitute, and simplify to a constant.
- Recovering $f(x)$ from $f'(x)$ with a condition ($f'(x) = 10x^2 + 4x$, $f(-3) = 17$): integrate term-wise, then use the given point to fix the constant.

MTP 2025-Jan S2 [38] · Pg 467

COMPUTE
75 sec

Easy

PYQ 2018-May [26] · Pg 463	COMPUTE 75 sec	Medium
PYQ 2021-Jul [38] · Pg 464	COMPUTE 75 sec	Medium
PYQ 2022-Jun [38] · Pg 465	COMPUTE 75 sec	Medium
PYQ 2024-Jun [38] · Pg 465	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [38] · Pg 466	COMPUTE 75 sec	Medium
PYQ 2025-May [40] · Pg 466	COMPUTE 75 sec	Medium
PYQ 2026-Jan [15] · Pg 467	COMPUTE 75 sec	Medium

Topic 4: Implicit Functions

P3-C8-U8-T04

Read first Study the implicit-function section: for $f(x, y) = 0$ (e.g. $x^2y^2 + 3xy + y = 0$) differentiate both sides w.r.t. x treating y as a function of x , then solve the resulting equation for dy/dx .

COMPUTE 75 sec one formula, straight through · 7 questions Application · Level II

- Routine: differentiate every term w.r.t. x (using product rule where x and y multiply, and $d/dx(y^n) = n y^{(n-1)} \cdot dy/dx$), collect dy/dx terms, and solve.
- Memorise the classic result: $x^3 + y^3 - 3axy = 0$ gives $dy/dx = (ay - x^2)/(y^2 - ax)$; the $x^5 + y^5 - 5xy = 0$ version follows the same pattern $(y - x^4)/(y^4 - x)$.
- Infinite-series functions like $y = 1 + x + x^2/2! + x^3/3! + \dots$: recognise $y = e^x$ so $dy/dx = y$.
- Rate-of-change wording (speed = $3x^2 - 5x + 4$, find rate at $x = 1$): 'rate of change' just means evaluate the derivative at the stated value.

PYQ 2020-Nov [34] · Pg 468	COMPUTE 75 sec	Easy
PYQ 2021-Dec [37] · Pg 468	COMPUTE 75 sec	Easy
PYQ 2021-Jul [39] · Pg 468	COMPUTE 75 sec	Medium
PYQ 2022-Dec [37] · Pg 469	COMPUTE 75 sec	Medium
PYQ 2023-Dec [35] · Pg 470	COMPUTE 75 sec	Medium
PYQ 2025-Sep [37] · Pg 471 asked 2x	COMPUTE 75 sec	Medium
PYQ 2026-Sep [60] · Pg 471	COMPUTE 75 sec	Medium

Topic 5: Parametric Equation

P3-C8-U8-T05

Read first Learn the parametric differentiation rule in the Study Material: for $x = f(t)$, $y = h(t)$, $dy/dx = (dy/dt)/(dx/dt)$, with the worked example $x = at^3$, $y = a/t^3$.

COMPUTE 75 sec one formula, straight through · 9 questions Application · Level II

- One method fits all: compute dy/dt and dx/dt separately, then $dy/dx = (dy/dt)/(dx/dt)$; simplify in t , and only then substitute the given t -value.
- Standard results to recognise instantly: $x = at^2$, $y = 2at$ gives $dy/dx = 1/t$ (so $1/2$ at $t = 2$); $x = t^2$, $y = t^3$ gives $dy/dx = 3t/2$.
- If both x and y are polynomials in t^2 only ($x = 5t^2 + 3$, $y = 2t^2 + 1$), dy/dx is the constant ratio of coefficients ($2/5$).
- Evaluate at $t = 0$ carefully when dx/dt has a constant term ($x = at^3 + bt^2 - t$, $y = at^2 - 2bt$ gives $dy/dx = -2b/(-1)$ type simplification at $t = 0$).

PYQ 2023-Dec [36] · Pg 472	COMPUTE 75 sec	Easy
PYQ 2024-Sep [63] · Pg 472	COMPUTE 75 sec	Easy
RTP 2024-Sep [11] · Pg 473 asked 4x	COMPUTE 75 sec	Easy
PYQ 2018-Nov [33] · Pg 471	COMPUTE 75 sec	Medium
PYQ 2025-Jan [61] · Pg 473	COMPUTE 75 sec	Medium
PYQ 2025-May [39] · Pg 474	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [37] · Pg 475	COMPUTE 75 sec	Medium
PYQ 2026-May [17] · Pg 475	COMPUTE 75 sec	Medium
PYQ 2026-Sep [62] · Pg 476	COMPUTE 75 sec	Medium

Topic 6: Logarithmic Differentiation

P3-C8-U8-T06

Read first Study the logarithmic differentiation section: take log of both sides when the function has a variable power (x^x) or is a product/quotient of several factors, then differentiate; also review the solved illustrations like $x^y = e^{y \ln x}$ and $x^m y^n = (x+y)^{(m+n)}$.

COMPUTE 75 sec one formula, straight through · 6 questions Application · Level II

- $y = x^x$: $\log y = x \log x$ gives $dy/dx = x^x(1 + \log x)$; at $x = 1$ the value is 1 — a repeat exam favourite.
- For $x^y = y^x$, take logs ($y \log x = x \log y$), differentiate implicitly and solve for dy/dx ; symmetric answers in x, y appear among options.
- Quotient-under-root forms like $\log \sqrt{(1-x)/(1+x)}$: expand as $(1/2)[\log(1-x) - \log(1+x)]$ before differentiating — the answer collapses to $-1/(1-x^2)$ form.
- Exponential equations ($2^x - 2^y = 2^{(x-y)}$): differentiate both sides using $d/dx(a^x) = a^x \log a$, then substitute the given point ($x = y = 2$).

MTP 2024-Jun S3 [7] · Pg 479	COMPUTE 75 sec	Easy
PYQ 2019-Jun [34] · Pg 476	COMPUTE 75 sec	Medium
PYQ 2019-Nov [39] · Pg 477	COMPUTE 75 sec	Medium
PYQ 2022-Dec [35] · Pg 478	COMPUTE 75 sec	Medium
PYQ 2022-Dec [36] · Pg 479	COMPUTE 75 sec	Medium
PYQ 2026-May [19] · Pg 479	COMPUTE 75 sec	Medium

Topic 7: Some More Examples

P3-C8-U8-T07

Read first Work through the solved 'more examples' block: $x^y = e^{(x-y)}$ leading to $dy/dx = \log x / (1 + \log x)^2$, and the mixed exercises combining implicit differentiation with second derivatives and economics-style cost expressions.

COMPUTE 75 sec one formula, straight through · 2 questions Application · Level II

- Memorise the result: if $x^y = e^{(x-y)}$ then $dy/dx = \log x / (1 + \log x)^2$ (derived via $y \log x = x - y$).
- $xy = 1$ combinations: $y = 1/x$ gives $dy/dx = -1/x^2 = -y^2$, so $y^2 + dy/dx = 0$.
- Marginal cost minimum: for $C(x) = 500 - 20x^2 + x^3/3$, $MC = C'(x)$; minimise MC by setting $MC'(x) = 0$ (here $-40 + 2x = 0$, $x = 20$) and checking $MC'' > 0$.

PYQ 2021-Dec [35] · Pg 480	COMPUTE 75 sec	Medium
PYQ 2023-Jun [39] · Pg 481	COMPUTE 75 sec	Medium

Topic 8: Geometric Interpretation of the Differentiation

P3-C8-U8-T08

Read first Read the geometric interpretation section: dy/dx at a point is the slope (gradient) of the tangent to $y = f(x)$ there, with the worked gradient example for $y = 3x^2 - 5x + 4$ at $(1, 2)$; also connect to curve-recovery via integration and maxima/minima.

COMPUTE 75 sec one formula, straight through · 4 questions Application · Level II

- Gradient at a point: differentiate and substitute — $y = 3x^2 - 6x + 4$ at $(1, 2)$ gives $dy/dx = 6(1) - 6 = 0$.
- Equation of curve from slope: integrate dy/dx (e.g. slope $3x - 4$ gives $y = 3x^2/2 - 4x + c$) and use the given point to find c .
- Maxima/minima: set $dy/dx = 0$, solve, then use the sign of d^2y/dx^2 (negative = maximum, positive = minimum) — e.g. $y = 2x^3 - 15x^2 + 36x + 10$ has max at $x = 2$, min at $x = 3$.
- Rate-of-change of slope: slope of $y = 2 - x^2$ is $-2x$, so if x increases at 3 units/s the slope changes at $-2(3) = -6$, i.e. decreases at 6 units/s.

MTP 2024-Jun S3 [9] · Pg 484	COMPUTE 75 sec	Easy
PYQ 2022-Dec [33] · Pg 482	COMPUTE 75 sec	Medium
PYQ 2022-Dec [34] · Pg 482	COMPUTE 75 sec	Medium
PYQ 2023-Jun [38] · Pg 483	COMPUTE 75 sec	Medium

Topic 9: Applications of Differential calculus in Economics

P3-C8-U8-T09

Read first Study Section 'Applications of Differential Calculus' and 8.C: cost function $C(x) = V(x) + F(x)$, average cost $AC = C(x)/x$, marginal cost $MC = dC/dx$, revenue $R(x) = p \cdot x$, $MR = dR/dx$, profit $P(x) = R(x) - C(x)$, break-even point $R(x) = C(x)$, and MPC/MPS.

COMPUTE 75 sec one formula, straight through · 13 questions Application · Level II

- $MC = dC/dx$ and $AC = C/x$; when AC is given, multiply by Q to get total cost, then differentiate ($AC = 2Q + 6 + 13/Q$ gives $C = 2Q^2 + 6Q + 13$, $MC = 4Q + 6 = 66$ at $Q = 15$).
- Minimum cost/MC/AC: differentiate the target, set it to 0, confirm with the second derivative; for the $AC = MC$ condition, set $C(x)/x = C'(x)$ and solve for x .
- Total revenue from MR: $R(x) = \int MR \, dx$ with constant 0 ($MR = 5 - 4x + 3x^2$ gives $R = 5x - 2x^2 + x^3$); maximum revenue where $R'(x) = 0$ ($R = 100x - 2x^2$ peaks at $x = 25$).

PYQ 2026-May [20] · Pg 495	COMPUTE 75 sec	Easy
PYQ 2018-May [28] · Pg 484 asked 2×	COMPUTE 75 sec	Medium
PYQ 2019-Jun [33] · Pg 485	COMPUTE 75 sec	Medium
PYQ 2020-Nov [35] · Pg 487	COMPUTE 75 sec	Medium
PYQ 2021-Jan [34] · Pg 487	COMPUTE 75 sec	Medium
PYQ 2021-Jul [36] · Pg 489	COMPUTE 75 sec	Medium
PYQ 2021-Jul [37] · Pg 489	COMPUTE 75 sec	Medium
PYQ 2025-Jan [57] · Pg 491 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-Sep [38] · Pg 491	COMPUTE 75 sec	Medium
PYQ 2026-Jan [16] · Pg 492	COMPUTE 75 sec	Medium
PYQ 2026-Jan [72] · Pg 493	COMPUTE 75 sec	Medium
PYQ 2026-Sep [29] · Pg 495	COMPUTE 75 sec	Medium
PYQ 2026-Sep [38] · Pg 496	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 1 question Analysis · Level II

- Demand-to-revenue setups: if the demand line is $x = 25 - 2y$ (price x , quantity y), first build $R = x \cdot y = (25 - 2y)y$, then differentiate for MR and optimise — always convert the word problem into R , C , P functions of one variable before any calculus.
- Marginal-profit-at-a-level questions: form $P(x) = R(x) - C(x)$ with $R(x) = p(x) \cdot x$ from the demand function, then compute $P'(x)$ and substitute the stated output.

MTP 2024-Dec S1 [39] · Pg 491

SET UP
150 sec

Medium

Topic 10: Integration Calculus

P3-C8-U8-T10

Read first Read the opening of the integration section: integration as the reverse (inverse) process of differentiation, $\int x^n dx = x^{(n+1)}/(n+1) + c$, and why the constant of integration c is added.

COMPUTE 75 sec one formula, straight through · 7 questions Application · Level II

- $\int \log x \, dx$ is done by parts ($u = \log x$, $dv = dx$): result $x \log x - x + c$, which options often rewrite as $x \cdot \log(x/e) + c$ — recognise both forms.
- Treat every indefinite integral as 'which function differentiates back to the integrand': differentiate your chosen option mentally to confirm, and always add $+ c$.
- Keep the differentiation table in view — since integration reverses it, x^n comes from $x^{(n+1)}/(n+1)$, $1/x$ from $\log x$, e^{ax} from e^{ax}/a .

MTP 2024-Jun S3 [11] · Pg 496	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [39] · Pg 496	COMPUTE 75 sec	Medium
PYQ 2024-Sep [64] · Pg 496	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [40] · Pg 497	COMPUTE 75 sec	Medium
RTP 2025-Jan [12] · Pg 497	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [37] · Pg 497	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [39] · Pg 498	COMPUTE 75 sec	Medium

Topic 11: Basic Formulas

P3-C8-U8-T11

Read first Memorise the basic-formulas table: $\int x^n \, dx = x^{(n+1)}/(n+1) + c$, $\int dx = x + c$, $\int e^x \, dx = e^x + c$, $\int e^{ax} \, dx = e^{ax}/a + c$, $\int dx/x = \log x + c$, $\int a^x \, dx = a^x/\log_e a + c$, plus the elementary rules and integration by parts $\int u \, v \, dx = u \int v \, dx - \int [u' \int v \, dx] \, dx$.

RECALL 30 sec know it or move on — no question in this edition Remembering · Level I

- $\int e^{ax} \, dx = e^{ax}/a + c$ (not $e^{ax} + c$ — the divide-by-a trap is the whole question).
- $\int a^x \, dx = a^x/\log_e a + c$; $\int dx/x = \log x + c$; $\int x^n \, dx = x^{(n+1)}/(n+1) + c$ ($n \neq -1$).
- $\int e^x [f(x) + f'(x)] \, dx = e^x f(x) + c$ — the exponential shortcut used across several MCQs.

COMPUTE 75 sec one formula, straight through · 6 questions Application · Level II

- Integration by parts (ILATE order): $\int x e^x \, dx = (x - 1)e^x + c$; $\int x^2 e^{3x} \, dx = e^{3x}(x^2/3 - 2x/9 + 2/27) + c$; $\int (\log x)^2 \, dx = x(\log x)^2 - 2x \log x + 2x + c$.
- Spot $e^x[f + f']$ forms: $\int e^x(x \log x + 1)/x \, dx = \int e^x(\log x + 1/x) \, dx = e^x \log x + c$.
- Products of exponentials: $2^{(3x)} \cdot 3^{(2x)} \cdot 5^x = (8 \cdot 9 \cdot 5)^x = 360^x$, so the integral is $360^x/\log_e 360 + c$; similarly $\int 2^x/5^x \, dx$ uses $(2/5)^x$.

- Recover $f(x)$ from $f'(x)$ plus a point: integrate term-wise and fix the constant ($f'(x) = 12x^2 - 4x$, $f(3) = 17$ gives $f(x) = 4x^3 - 2x^2 - 143$).

PYQ 2019-Nov [35] · Pg 498	COMPUTE 75 sec	Medium
PYQ 2020-Nov [32] · Pg 499 asked 2×	COMPUTE 75 sec	Medium
PYQ 2020-Nov [33] · Pg 499	COMPUTE 75 sec	Medium
PYQ 2022-Jun [39] · Pg 500	COMPUTE 75 sec	Medium
PYQ 2025-May [38] · Pg 501 asked 2×	COMPUTE 75 sec	Medium
PYQ 2026-May [18] · Pg 501	COMPUTE 75 sec	Medium

Topic 12: Method of Substitution (change of variable)

P3-C8-U8-T12

Read first Study the Method of Substitution section: put $z = f(x)$, adjust $dz = f'(x)dx$, integrate in z , and substitute back — worked examples $\int (2x+3)^7 dx$ and $\int x^3/(x^2+1)^3 dx$; also note $\int f'(x)/f(x) dx = \log f(x) + c$.

COMPUTE 75 sec one formula, straight through · 7 questions Application · Level II

- Linear-inside power: $\int (ax+b)^n dx = (ax+b)^{n+1}/[a(n+1)] + c$ — e.g. $\int (2x-3)^5 dx = (2x-3)^6/12 + c$; this is the fastest scoring type.
- Derivative-present substitution: in $\int x(x^2+4)^5 dx$ put $t = x^2 + 4$ ($dt = 2x dx$) to get $(x^2+4)^6/12 + c$.
- Log-power forms: $\int dx/[x(\log x)^2]$ with $t = \log x$ gives $-1/\log x + c$; generally look for $f'(x)$ sitting beside a function of $f(x)$.
- $\int x^a x(1 + \log x) dx = x^{a+1} + c$ — recognise the integrand as $d/dx(x^a x)$.

PYQ 2018-Nov [34] · Pg 502	COMPUTE 75 sec	Medium
PYQ 2019-Nov [34] · Pg 502	COMPUTE 75 sec	Medium
PYQ 2019-Nov [36] · Pg 503	COMPUTE 75 sec	Medium
PYQ 2021-Dec [38] · Pg 503	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [8] · Pg 504	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [10] · Pg 504	COMPUTE 75 sec	Medium

PYQ 2024-Sep [71] · Pg 505

COMPUTE
75 sec**Medium**

Topic 13: Method of Partial Fraction

P3-C8-U8-T13

Read first Study the three partial-fraction types in the Study Material: non- repeated linear factors (Type I), repeated linear factors (Type II), and a quadratic factor (Type III), each resolved into $A/(x-a)$ style fractions before integrating.

COMPUTE 75 sec one formula, straight through · 1 question Application · Level II

- Split the integrand: write $N(x)/[(x-a)(x-b)] = A/(x-a) + B/(x-b)$; find A, B by substituting $x = a$ and $x = b$, then integrate each term to logs — answer looks like $A \log(x-a) + B \log(x-b) + c$, often combined into $\log[(x-a)^A (x-b)^B] + c$.
- Memorise the ready formula $\int dx/(x^2 - a^2) = (1/2a) \cdot \log[(x-a)/(x+a)] + c$, which partial fractions reproduces.
- Check degree first: if numerator degree $\geq$ denominator degree, divide before splitting.

PYQ 2023-Jun [37] · Pg 505

COMPUTE
75 sec**Medium**

Topic 14: Definite Integration

P3-C8-U8-T14

Read first Learn the definite-integral section: if $\int f(x)dx = f(x)$ then $\int[a \text{ to } b] F(x)dx = f(b) - f(a)$, no constant c; work through the solved examples like $\int[1 \text{ to } 2](x^2 + 5x + 2)dx$ and piecewise-defined integrands.

COMPUTE 75 sec one formula, straight through · 13 questions Application · Level II

- Routine evaluation: integrate, then compute $f(\text{upper}) - f(\text{lower})$; never add + c — options containing '+ c' for a definite integral are distractors.
- $\int 2x/(1+x^2)dx$ over $[1, 2]$ is $\log(1+x^2)$ evaluated: $\log 5 - \log 2 = \log(5/2)$; recognise $f'/f = \log f$ for definite limits.
- Piecewise $f(x)$ ($f = 1 + x$ for $x \geq 0$, $1 - 2x$ for $x < 0$): split the integral at 0 using property III, integrate each piece separately, then add.
- For $\int e^x(x^2 + 2x)dx$ spot $e^x[f + f']$ with $f = x^2$: answer $x^2 e^x (+ c \text{ if indefinite})$; with limits substitute directly.

PYQ 2026-Sep [35] · Pg 514

COMPUTE
75 sec**Easy**

PYQ 2018-May [25] · Pg 506	COMPUTE 75 sec	Medium
PYQ 2018-Nov [35] · Pg 507	COMPUTE 75 sec	Medium
PYQ 2019-Jun [35] · Pg 507	COMPUTE 75 sec	Medium
PYQ 2019-Jun [36] · Pg 508	COMPUTE 75 sec	Medium
PYQ 2022-Dec [38] · Pg 508	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [12] · Pg 509	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [40] · Pg 509	COMPUTE 75 sec	Medium
PYQ 2025-May [37] · Pg 509	COMPUTE 75 sec	Medium
PYQ 2025-Sep [39] · Pg 510	COMPUTE 75 sec	Medium
PYQ 2025-Sep [40] · Pg 511	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [39] · Pg 513	COMPUTE 75 sec	Medium
PYQ 2026-Jan [18] · Pg 513	COMPUTE 75 sec	Medium

Topic 15: Important Properties

P3-C8-U8-T15

Read first Memorise the six Important Properties of definite integrals in the Study Material: dummy-variable change, interchange of limits reverses sign, splitting at c , $\int[0,a]f(x)dx = \int[0,a]f(a-x)dx$, the $f(x) = f(a+x)$ periodic extension, and the even/odd rule $\int[-a,a]f = 2\int[0,a]f$ if f even, 0 if f odd.

RECALL 30 sec know it or move on — no question in this edition Remembering · Level I

- $\int e^x[f(x) + f'(x)]dx = e^x f(x) + c$ — stated as a fill-in-the-blank fact.
- Property IV: $\int[0 \text{ to } a]f(x)dx = \int[0 \text{ to } a]f(a-x)dx$; Property VI: $\int[-a \text{ to } a]f(x)dx = 0$ for odd f , $= 2\int[0 \text{ to } a]f(x)dx$ for even f .
- $\int[b \text{ to } a]f(x)dx = -\int[a \text{ to } b]f(x)dx$ and $\int[a \text{ to } b]f(x)dx = \int[a \text{ to } b]f(t)dt$ (dummy variable).

COMPUTE 75 sec one formula, straight through · 10 questions Application · Level II

- Symmetry trick: $\int[0 \text{ to } 2] x^2/[x^2 + (2-x)^2] dx$ — replace x by $(2-x)$ (property IV), add the two versions to get $\int dx = 2$, halve for answer 1.
- Property-V/period questions like $\int[2 \text{ to } 3]f(5-x)dx - \int[2 \text{ to } 3]f(x)dx$: the substitution $x \rightarrow 5-x$ maps the interval onto itself, so the difference is 0 (or spot the sign).

- Standard by-parts values with limits: $\int[0 \text{ to } 1]x e^x dx = 1$, $\int[1 \text{ to } e] \log x$ -type integrals, $\int e^{(3x)}$ between limits gives $(e^3 - e)/3$ patterns — integrate first, substitute limits carefully.
- $\int \log(ax) dx = x \log(ax) - x + c$ by parts — appears with and without limits.

PYQ 2018-May [27] · Pg 514	COMPUTE 75 sec	Medium
PYQ 2019-Jun [37] · Pg 515	COMPUTE 75 sec	Medium
PYQ 2019-Nov [37] · Pg 515	COMPUTE 75 sec	Medium
PYQ 2020-Nov [36] · Pg 516	COMPUTE 75 sec	Medium
PYQ 2021-Jan [35] · Pg 516	COMPUTE 75 sec	Medium
PYQ 2022-Jun [37] · Pg 517	COMPUTE 75 sec	Medium
PYQ 2023-Dec [34] · Pg 517	COMPUTE 75 sec	Medium
PYQ 2023-Dec [37] · Pg 518	COMPUTE 75 sec	Medium
PYQ 2024-Jun [34] · Pg 519	COMPUTE 75 sec	Medium
PYQ 2024-Jun [35] · Pg 520	COMPUTE 75 sec	Medium

CHAPTER 9

Number Series, Coding and Decoding and Odd Man Out

3 Topics · 126 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 77 sec a question on average — **about the pace of the paper**

RECOGNISE Understanding	2.0%	45 sec	2 of 98 past-exam questions
COMPUTE Application	94.9%	75 sec	93 of 98 past-exam questions
SET UP Analysis	3.1%	150 sec	3 of 98 past-exam questions

Topic 1: Number Series

P3-C9-U9-T01

Read first Study Section 9.1 (Series): number series (missing-term and wrong-term cases), alphabet series using the A=1...Z=26 position chart, and letter series (repeating small-letter patterns like aab, aba).

COMPUTE 75 sec one formula, straight through · 44 questions Application · Level II

- First test differences: successive gaps (+5, +9, +13...), second differences, or alternating gaps (two interleaved series like 28, 33, 31, 36, 34...). If differences fail, test ratios ($\times 2$, $\times 3$, $\times 4$...) for geometric series such as 4, 16, 64, 256, 1024.
- Keep the standard families at your fingertips: squares ($4, 16, 36, 64, 100 = \text{even squares}$), cubes, $n^2 \pm 1$, $n^3 \pm 1$, primes, and 'add previous two terms' (0, 2, 3, 6, 10, 17, 28, 46, 75 = sum of two terms back plus pattern; check Fibonacci-style rules when gaps look irregular).
- Mixed-operation rules: try $\times 2 + 1$, $\times 2 - 1$, $\times 3 + 2$ chains (1, 5, 21, 57... uses multiply- then-add patterns) when neither pure differences nor pure ratios fit.
- Alphabet series: convert letters to positions (A=1...Z=26), find the constant step with wraparound after Z — R, U, X, A, D is +3 each, so next is G. For fraction series treat numerators and denominators as two separate series.

PYQ 2018-Nov [38] · Pg 526	COMPUTE 75 sec	Easy
PYQ 2019-Nov [40] · Pg 527	COMPUTE 75 sec	Easy
PYQ 2019-Nov [42] · Pg 527	COMPUTE 75 sec	Easy

PYQ 2021-Dec [40] · Pg 529	COMPUTE 75 sec	Easy
PYQ 2022-Jun [46] · Pg 531	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [41] · Pg 534	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [45] · Pg 534	COMPUTE 75 sec	Easy
MTP 2024-Aug S2 [45] · Pg 534 asked 2×	COMPUTE 75 sec	Easy
PYQ 2024-Sep [72] · Pg 535	COMPUTE 75 sec	Easy
RTP 2024-Sep [14] · Pg 535 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-Jan [63] · Pg 535 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-Sep [42] · Pg 537	COMPUTE 75 sec	Easy
PYQ 2025-Sep [43] · Pg 537 asked 2×	COMPUTE 75 sec	Easy
PYQ 2026-Jan [21] · Pg 538	COMPUTE 75 sec	Easy
PYQ 2019-Jun [38] · Pg 526	COMPUTE 75 sec	Medium
PYQ 2020-Nov [37] · Pg 527	COMPUTE 75 sec	Medium
PYQ 2020-Nov [38] · Pg 528	COMPUTE 75 sec	Medium
PYQ 2020-Nov [42] · Pg 528	COMPUTE 75 sec	Medium
PYQ 2021-Jan [36] · Pg 528	COMPUTE 75 sec	Medium
PYQ 2021-Jan [37] · Pg 529	COMPUTE 75 sec	Medium
PYQ 2021-Jul [40] · Pg 529	COMPUTE 75 sec	Medium
PYQ 2021-Dec [41] · Pg 530	COMPUTE 75 sec	Medium
PYQ 2022-Jun [41] · Pg 530 asked 2×	COMPUTE 75 sec	Medium
PYQ 2022-Jun [43] · Pg 530	COMPUTE 75 sec	Medium
PYQ 2022-Jun [45] · Pg 530	COMPUTE 75 sec	Medium
PYQ 2022-Jun [47] · Pg 531	COMPUTE 75 sec	Medium

PYQ 2022-Dec [41] · Pg 531	COMPUTE 75 sec	Medium
PYQ 2022-Dec [43] · Pg 532	COMPUTE 75 sec	Medium
PYQ 2023-Jun [41] · Pg 532	COMPUTE 75 sec	Medium
PYQ 2023-Jun [43] · Pg 532	COMPUTE 75 sec	Medium
PYQ 2023-Dec [42] · Pg 533	COMPUTE 75 sec	Medium
PYQ 2024-Jun [40] · Pg 533	COMPUTE 75 sec	Medium
PYQ 2024-Jun [43] · Pg 533 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [42] · Pg 534	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [44] · Pg 534	COMPUTE 75 sec	Medium
PYQ 2024-Sep [70] · Pg 534	COMPUTE 75 sec	Medium
PYQ 2025-Jan [66] · Pg 536 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-May [41] · Pg 536	COMPUTE 75 sec	Medium
PYQ 2025-May [42] · Pg 536	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [41] · Pg 538	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [44] · Pg 539	COMPUTE 75 sec	Medium
PYQ 2026-May [21] · Pg 539	COMPUTE 75 sec	Medium
PYQ 2026-May [78] · Pg 539	COMPUTE 75 sec	Medium
PYQ 2026-Sep [36] · Pg 540	COMPUTE 75 sec	Medium

Topic 2: Coding and Decoding

P3-C9-U9-T02

Read first Study Section 9.2 (Coding and Decoding): Type 1 letter coding (shift each letter forward/backward, or rearrange positions) and Type 2 number coding (letter-to-digit assignment both ways), including the decoding cases worked in Examples 6-12.

COMPUTE 75 sec one formula, straight through · 52 questions Application · Level II

- Letter-shift codes: write the words one above the other and find the per-letter shift (all +1, all -1, or mixed like +2, -1, +1); apply the same shift to the target — HONEY → JQPGA is +2 each, so decode VCTIGVU by -2 to get TARGETS.
- Number codes: build the letter-to-digit key from the given words (LOSE = 1357 gives L=1, O=3, S=5, E=7), then encode/decode letter by letter; repeated letters take repeated digits (RIPPLE = 613382, so PILLER = 318826).
- Rearrangement codes: if the code uses the same letters reordered (THANKS → SKNTHA), map old positions to new positions and apply that map to the new word.
- Odd-one-out letter groups (CEHL, KMPT...): compute each group's internal gaps (+2, +3, +4); the group whose gap pattern differs is the answer.

PYQ 2018-May [29] · Pg 540 asked 2×	COMPUTE 75 sec	Easy
PYQ 2018-May [31] · Pg 541	COMPUTE 75 sec	Easy
PYQ 2018-May [37] · Pg 542	COMPUTE 75 sec	Easy
PYQ 2019-Nov [43] · Pg 542	COMPUTE 75 sec	Easy
PYQ 2021-Jan [40] · Pg 544	COMPUTE 75 sec	Easy
PYQ 2021-Jul [41] · Pg 544	COMPUTE 75 sec	Easy
PYQ 2021-Jul [42] · Pg 544	COMPUTE 75 sec	Easy
PYQ 2021-Jul [44] · Pg 545	COMPUTE 75 sec	Easy
PYQ 2021-Dec [39] · Pg 545	COMPUTE 75 sec	Easy
PYQ 2022-Jun [42] · Pg 546	COMPUTE 75 sec	Easy
PYQ 2022-Jun [44] · Pg 547	COMPUTE 75 sec	Easy
PYQ 2023-Dec [41] · Pg 549	COMPUTE 75 sec	Easy
PYQ 2024-Jun [42] · Pg 549 asked 2×	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [44] · Pg 550	COMPUTE 75 sec	Easy
MTP 2024-Aug S2 [42] · Pg 551	COMPUTE 75 sec	Easy
PYQ 2024-Sep [69] · Pg 551	COMPUTE 75 sec	Easy

PYQ 2024-Sep [73] · Pg 551	COMPUTE 75 sec	Easy
RTP 2024-Sep [12] · Pg 552 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-Jan [62] · Pg 552 asked 3×	COMPUTE 75 sec	Easy
PYQ 2025-Jan [69] · Pg 553 asked 3×	COMPUTE 75 sec	Easy
RTP 2025-Jan [20] · Pg 554	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [50] · Pg 554	COMPUTE 75 sec	Easy
PYQ 2026-Jan [73] · Pg 558	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [44] · Pg 559	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [45] · Pg 559	COMPUTE 75 sec	Easy
PYQ 2026-May [77] · Pg 560	COMPUTE 75 sec	Easy
PYQ 2026-May [74] · Pg 560	COMPUTE 75 sec	Easy
PYQ 2026-May [75] · Pg 561	COMPUTE 75 sec	Easy
PYQ 2026-Sep [11] · Pg 562	COMPUTE 75 sec	Easy
PYQ 2026-Sep [13] · Pg 562	COMPUTE 75 sec	Easy
PYQ 2026-Sep [37] · Pg 562	COMPUTE 75 sec	Easy
PYQ 2020-Nov [40] · Pg 543	COMPUTE 75 sec	Medium
PYQ 2021-Jan [39] · Pg 543	COMPUTE 75 sec	Medium
PYQ 2021-Dec [43] · Pg 545	COMPUTE 75 sec	Medium
PYQ 2021-Dec [44] · Pg 546	COMPUTE 75 sec	Medium
PYQ 2022-Dec [39] · Pg 547	COMPUTE 75 sec	Medium
PYQ 2022-Dec [42] · Pg 547	COMPUTE 75 sec	Medium
PYQ 2022-Dec [44] · Pg 548 asked 3×	COMPUTE 75 sec	Medium
PYQ 2023-Jun [44] · Pg 548 asked 2×	COMPUTE 75 sec	Medium

PYQ 2023-Dec [38] · Pg 548	COMPUTE 75 sec	Medium
PYQ 2023-Dec [39] · Pg 549	COMPUTE 75 sec	Medium
PYQ 2024-Jun [44] · Pg 550	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [43] · Pg 550	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [41] · Pg 550	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [43] · Pg 552	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [44] · Pg 552 asked 2×	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [44] · Pg 554	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [45] · Pg 554 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-May [44] · Pg 555	COMPUTE 75 sec	Medium
PYQ 2025-Sep [44] · Pg 556	COMPUTE 75 sec	Medium
PYQ 2025-Sep [45] · Pg 557	COMPUTE 75 sec	Medium
PYQ 2026-Jan [19] · Pg 558 asked 3×	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 4 questions Analysis · Level II

- Sentence-code puzzles ('256' = 'you are good', '637' = 'we are bad', '358' = 'good and bad'): intersect sentence pairs — a word shared by two sentences must be their shared digit ('are'); the digit left over codes the unique word ('and' = 8).
- Prove digits by elimination and strike them out of every sentence; never assume digits follow the word order within a sentence.

PYQ 2018-May [30] · Pg 541	SET UP 150 sec	Medium
MTP 2024-Aug S2 [43] · Pg 551	SET UP 150 sec	Medium
RTP 2025-Jan [17] · Pg 554	SET UP 150 sec	Medium
PYQ 2025-May [45] · Pg 555	SET UP 150 sec	Medium

Topic 3: Odd man out

P3-C9-U9-T03

Read first Study Section 9.3 (Odd Man Out / classification): sorting the items of a group by a common quality — divisibility, prime/composite, perfect squares or cubes, standard series patterns — and spotting the stranger, as in Examples 13-17.

RECOGNISE 45 sec decide which idea applies · 2 questions · Understanding · Level I

- Classification rests on a common defining quality: in word groups pick the item outside the class (Marriage/Wedlock/Matrimony are synonyms, Divorce is the opposite).
- Read all four options before fixing the basis — the intended quality must isolate exactly one item.

PYQ 2021-Dec [42] · Pg 564	RECOGNISE 45 sec	Easy
PYQ 2025-Jan [70] · Pg 566	RECOGNISE 45 sec	Easy

COMPUTE 75 sec one formula, straight through · 23 questions · Application · Level II

- Number groups: test the obvious classes in order — multiples of 3 (6, 9, 15, 21, 24, 26, 30 → 26 fails), primes (7, 9, 13, 17, 19 → 9 fails), evens, squares (16, 25, 36, 62... → 62) or cubes (8, 64, 125, 216 → 25).
- Wrong-term-in-series: reconstruct the intended rule (n^2 pattern 225, 196, 169... → 77 breaks it; sums of squares 1, 5, 14, 30, 55, 91 → 49 is the intruder) and pick the violating term.
- Ratio-built series (4, 12, 44, 176, 890): verify each step against the multiply-and- add rule; the term where it first fails is the odd one.

PYQ 2018-Nov [41] · Pg 562	COMPUTE 75 sec	Easy
PYQ 2020-Nov [39] · Pg 563	COMPUTE 75 sec	Easy
PYQ 2021-Jan [38] · Pg 564	COMPUTE 75 sec	Easy
PYQ 2021-Jul [43] · Pg 564	COMPUTE 75 sec	Easy
PYQ 2023-Jun [45] · Pg 565	COMPUTE 75 sec	Easy
PYQ 2024-Jun [41] · Pg 565 asked 2×	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [46] · Pg 566 asked 2×	COMPUTE 75 sec	Easy
RTP 2025-Jan [16] · Pg 567	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [41] · Pg 567	COMPUTE 75 sec	Easy

PYQ 2026-Jan [70] · Pg 568	COMPUTE 75 sec	Easy
PYQ 2018-Nov [40] · Pg 562	COMPUTE 75 sec	Medium
PYQ 2019-Jun [39] · Pg 563	COMPUTE 75 sec	Medium
PYQ 2019-Nov [41] · Pg 563	COMPUTE 75 sec	Medium
PYQ 2019-Nov [44] · Pg 563	COMPUTE 75 sec	Medium
PYQ 2022-Dec [40] · Pg 565	COMPUTE 75 sec	Medium
PYQ 2023-Jun [42] · Pg 565	COMPUTE 75 sec	Medium
PYQ 2024-Sep [68] · Pg 566	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [41] · Pg 566	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [43] · Pg 567	COMPUTE 75 sec	Medium
PYQ 2025-May [43] · Pg 567	COMPUTE 75 sec	Medium
PYQ 2025-Sep [41] · Pg 568	COMPUTE 75 sec	Medium
PYQ 2026-Jan [71] · Pg 569	COMPUTE 75 sec	Medium
PYQ 2026-Sep [39] · Pg 569	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 1 question Analysis · Level II

- Mixed letter-number terms (G4T, J10R, M20P, P43N, S90L): split each term into streams — letters step +3/-2 per position, numbers follow their own $x2 + k$ rule; check each stream separately.
- The wrong term breaks either stream while all others fit — verify the rule on three terms before rejecting one.

PYQ 2020-Nov [41] · Pg 564	SET UP 150 sec	Medium
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CHAPTER 10

Direction Tests

1 Topics · 110 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 92 sec a question on average — **about the pace of the paper**

COMPUTE Application **77.6%** 75 sec 66 of 85 past-exam questions

SET UP Analysis **22.4%** 150 sec 19 of 85 past-exam questions

Topic 1: Introduction

P3-C10-U10-T01

Read first Study Chapter 10 (Direction Sense Test): the compass rose of four main directions (N, S, E, W) and four cardinal ones (NE, NW, SE, SW), the 'Always Remember' turn table (left+left = down, left+right = up, etc.), and the worked examples on tracing a walker's path.

COMPUTE 75 sec one formula, straight through · 87 questions Application · Level II

- Always draw the N-E-S-W cross and trace each move as an arrow; read the final facing direction or position relative to the start off the sketch.
- Turning rule: a right turn is 90 degrees clockwise (N to E to S to W), a left turn 90 degrees anti-clockwise.
- Sun facts: sun rises in the East, so morning shadows fall West, evening shadows East; 'facing the Sun in the morning' = facing East.
- Body logic: if your right hand points South you face West (back to East) — rotate the whole body diagram.

PYQ 2018-May [34] · Pg 575	COMPUTE 75 sec	Easy
PYQ 2018-May [35] · Pg 575	COMPUTE 75 sec	Easy
PYQ 2018-May [36] · Pg 575	COMPUTE 75 sec	Easy
PYQ 2018-May [37] · Pg 576	COMPUTE 75 sec	Easy
PYQ 2018-Nov [44] · Pg 577	COMPUTE 75 sec	Easy
PYQ 2019-Nov [46] · Pg 581	COMPUTE 75 sec	Easy
PYQ 2019-Nov [47] · Pg 581	COMPUTE 75 sec	Easy

PYQ 2019-Nov [48] · Pg 582	COMPUTE 75 sec	Easy
PYQ 2019-Nov [49] · Pg 582	COMPUTE 75 sec	Easy
PYQ 2023-Dec [46] · Pg 599	COMPUTE 75 sec	Easy
PYQ 2024-Jun [45] · Pg 599	COMPUTE 75 sec	Easy
PYQ 2024-Jun [46] · Pg 600	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [47] · Pg 602	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [48] · Pg 602	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [49] · Pg 602	COMPUTE 75 sec	Easy
PYQ 2025-Jan [67] · Pg 607 asked 3×	COMPUTE 75 sec	Easy
PYQ 2025-Jan [68] · Pg 608 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-Jan [71] · Pg 608 asked 3×	COMPUTE 75 sec	Easy
PYQ 2025-Jan [73] · Pg 608 asked 2×	COMPUTE 75 sec	Easy
PYQ 2026-Jan [20] · Pg 619	COMPUTE 75 sec	Easy
PYQ 2026-May [76] · Pg 620	COMPUTE 75 sec	Easy
PYQ 2018-May [32] · Pg 574	COMPUTE 75 sec	Medium
PYQ 2018-Nov [42] · Pg 576	COMPUTE 75 sec	Medium
PYQ 2018-Nov [43] · Pg 577	COMPUTE 75 sec	Medium
PYQ 2018-Nov [45] · Pg 578 asked 2×	COMPUTE 75 sec	Medium
PYQ 2019-Jun [42] · Pg 578	COMPUTE 75 sec	Medium
PYQ 2019-Jun [43] · Pg 579	COMPUTE 75 sec	Medium
PYQ 2019-Jun [44] · Pg 579	COMPUTE 75 sec	Medium
PYQ 2019-Nov [45] · Pg 580	COMPUTE 75 sec	Medium
PYQ 2020-Nov [44] · Pg 582	COMPUTE 75 sec	Medium

PYQ 2021-Jan [42] · Pg 584	COMPUTE 75 sec	Medium
PYQ 2021-Dec [45] · Pg 587	COMPUTE 75 sec	Medium
PYQ 2021-Dec [48] · Pg 588	COMPUTE 75 sec	Medium
PYQ 2022-Jun [49] · Pg 590	COMPUTE 75 sec	Medium
PYQ 2022-Jun [51] · Pg 592 asked 3×	COMPUTE 75 sec	Medium
PYQ 2022-Jun [52] · Pg 592	COMPUTE 75 sec	Medium
PYQ 2022-Dec [45] · Pg 593	COMPUTE 75 sec	Medium
PYQ 2022-Dec [46] · Pg 593	COMPUTE 75 sec	Medium
PYQ 2022-Dec [47] · Pg 594	COMPUTE 75 sec	Medium
PYQ 2022-Dec [48] · Pg 594 asked 2×	COMPUTE 75 sec	Medium
PYQ 2023-Jun [46] · Pg 595	COMPUTE 75 sec	Medium
PYQ 2023-Jun [47] · Pg 595 asked 2×	COMPUTE 75 sec	Medium
PYQ 2023-Jun [49] · Pg 597	COMPUTE 75 sec	Medium
PYQ 2023-Dec [43] · Pg 597	COMPUTE 75 sec	Medium
PYQ 2023-Dec [44] · Pg 598 asked 2×	COMPUTE 75 sec	Medium
PYQ 2023-Dec [45] · Pg 598 asked 2×	COMPUTE 75 sec	Medium
PYQ 2024-Jun [47] · Pg 600	COMPUTE 75 sec	Medium
PYQ 2024-Jun [48] · Pg 601	COMPUTE 75 sec	Medium
PYQ 2024-Jun [49] · Pg 601	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [59] · Pg 602	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [55] · Pg 603	COMPUTE 75 sec	Medium
PYQ 2024-Sep [76] · Pg 604	COMPUTE 75 sec	Medium
RTP 2024-Sep [15] · Pg 606	COMPUTE 75 sec	Medium

MTP 2024-Dec S1 [46] · Pg 606 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [47] · Pg 606 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [48] · Pg 606	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [49] · Pg 607 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [50] · Pg 607	COMPUTE 75 sec	Medium
PYQ 2025-Jan [74] · Pg 609	COMPUTE 75 sec	Medium
RTP 2025-Jan [19] · Pg 609	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [57] · Pg 610	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [58] · Pg 610	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [59] · Pg 610	COMPUTE 75 sec	Medium
PYQ 2025-May [46] · Pg 610	COMPUTE 75 sec	Medium
PYQ 2025-May [47] · Pg 611 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-Sep [47] · Pg 613	COMPUTE 75 sec	Medium
PYQ 2025-Sep [48] · Pg 614	COMPUTE 75 sec	Medium
PYQ 2025-Sep [46] · Pg 616	COMPUTE 75 sec	Medium
PYQ 2025-Sep [50] · Pg 616	COMPUTE 75 sec	Medium
PYQ 2026-Jan [77] · Pg 617	COMPUTE 75 sec	Medium
PYQ 2026-Jan [76] · Pg 617	COMPUTE 75 sec	Medium
PYQ 2026-Jan [74] · Pg 618	COMPUTE 75 sec	Medium
PYQ 2026-Jan [22] · Pg 618	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [46] · Pg 619	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [47] · Pg 620	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [48] · Pg 620	COMPUTE 75 sec	Medium

MTP 2026-Apr S1 [49] · Pg 620	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [50] · Pg 620	COMPUTE 75 sec	Medium
PYQ 2026-May [25] · Pg 621	COMPUTE 75 sec	Medium
PYQ 2026-May [24] · Pg 622	COMPUTE 75 sec	Medium
PYQ 2026-May [22] · Pg 622	COMPUTE 75 sec	Medium
RTP 2026-May [16] · Pg 623	COMPUTE 75 sec	Medium
PYQ 2026-Sep [12] · Pg 624	COMPUTE 75 sec	Medium
PYQ 2026-Sep [14] · Pg 624	COMPUTE 75 sec	Medium
PYQ 2026-Sep [87] · Pg 624	COMPUTE 75 sec	Medium
PYQ 2026-Sep [89] · Pg 624	COMPUTE 75 sec	Medium
PYQ 2026-Sep [90] · Pg 624	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 23 questions · Analysis · Level II

- Net displacement: total N-S and E-W moves separately, state the combined direction (e.g. North-East) and use distance = $\sqrt{x^2 + y^2}$; 3-4-5 and 6-8-10 triples recur.
- Shadow puzzles: fix East from where the morning shadow falls, orient both objects, then answer the relative direction.
- Rotated-clock puzzles: locate where 12 points from the given hand position, then place the required hand at the new time.
- Multi-town layouts and step-length walks: plot every clue on one rough map (converting steps to metres first) before comparing positions.

PYQ 2021-Jul [45] · Pg 585	SET UP 150 sec	Medium
PYQ 2021-Jul [46] · Pg 585	SET UP 150 sec	Medium
PYQ 2021-Jul [47] · Pg 586	SET UP 150 sec	Medium
PYQ 2021-Jul [48] · Pg 586	SET UP 150 sec	Medium
PYQ 2021-Dec [46] · Pg 587	SET UP 150 sec	Medium
PYQ 2021-Dec [47] · Pg 588	SET UP 150 sec	Medium

PYQ 2022-Jun [48] · Pg 590	SET UP 150 sec	Medium
PYQ 2022-Jun [50] · Pg 591	SET UP 150 sec	Medium
PYQ 2023-Jun [50] · Pg 597	SET UP 150 sec	Medium
MTP 2024-Aug S2 [51] · Pg 603	SET UP 150 sec	Medium
MTP 2024-Aug S2 [52] · Pg 603	SET UP 150 sec	Medium
MTP 2024-Aug S2 [53] · Pg 603	SET UP 150 sec	Medium
MTP 2024-Aug S2 [54] · Pg 603	SET UP 150 sec	Medium
PYQ 2024-Sep [74] · Pg 604	SET UP 150 sec	Medium
PYQ 2024-Sep [77] · Pg 605	SET UP 150 sec	Medium
PYQ 2025-May [48] · Pg 611	SET UP 150 sec	Medium
PYQ 2025-May [49] · Pg 612	SET UP 150 sec	Medium
PYQ 2025-Sep [49] · Pg 614	SET UP 150 sec	Medium
PYQ 2026-May [23] · Pg 623	SET UP 150 sec	Medium
PYQ 2020-Nov [45] · Pg 583	SET UP 150 sec	Hard
PYQ 2021-Dec [49] · Pg 589	SET UP 150 sec	Hard
PYQ 2023-Jun [48] · Pg 596	SET UP 150 sec	Hard
PYQ 2024-Sep [78] · Pg 605	SET UP 150 sec	Hard

CHAPTER 11

Seating Arrangements

1 Topics · 102 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **SET UP** · 148 sec a question on average — **slower than the paper**

COMPUTE Application	2.5%	75 sec	2 of 81 past-exam questions
SET UP Analysis	97.5%	150 sec	79 of 81 past-exam questions

Topic 1: Introduction

P3-C11-U11-T01

Read first Study Chapter 11 (Seating Arrangements): the classification into linear, circular and polygon arrangements (11.1), Type-1 Linear Arrangement with the definite/comparative/negative information sort and two-row facing setups, and the circular examples (facing centre vs facing away, rotations).

COMPUTE 75 sec one formula, straight through · 2 questions Application · Level II

- Position count: m-th from left and n-th from right gives total = $m + n - 1$.
- If Q's place is given via P (e.g. Q is 3rd left of P who is 13th from left), first fix Q's left-rank, then apply total = Q-left + Q-right - 1.

PYQ 2021-Dec [54] · Pg 636

COMPUTE
75 sec**Medium**

PYQ 2026-Jan [23] · Pg 662

COMPUTE
75 sec**Medium**

SET UP 150 sec set it up before you compute · 100 questions Analysis · Level II

- Linear rows: place definite clues (ends, exact seats) first, add comparative clues (second to the right of...), and use negative clues (not next to) to eliminate; draw slots and fill.
- Facing North, diagram-left = persons' left; in two facing rows left/right are mirrored and opposites sit face to face.
- Circular tables: anchor one person; facing the centre, left = clockwise and right = anti-clockwise (reversed when facing outward); list all seatings surviving the clues before answering 'must be true'.
- Floor/flat puzzles are vertical linear arrangements: stack names using above/below chains, then read off top, middle or bottom.

PYQ 2019-Jun [45] · Pg 629	SET UP 150 sec	Easy
PYQ 2019-Nov [51] · Pg 630	SET UP 150 sec	Easy
PYQ 2021-Dec [51] · Pg 635	SET UP 150 sec	Easy
PYQ 2022-Dec [51] · Pg 638	SET UP 150 sec	Easy
PYQ 2023-Dec [49] · Pg 641	SET UP 150 sec	Easy
MTP 2024-Jun S3 [50] · Pg 644	SET UP 150 sec	Easy
PYQ 2025-Jan [72] · Pg 649	SET UP 150 sec	Easy
PYQ 2025-Jan [80] · Pg 653 asked 2×	SET UP 150 sec	Easy
MTP 2025-Jan S2 [60] · Pg 654	SET UP 150 sec	Easy
PYQ 2025-May [54] · Pg 655 asked 5×	SET UP 150 sec	Easy
PYQ 2026-Jan [26] · Pg 661	SET UP 150 sec	Easy
PYQ 2026-May [82] · Pg 664	SET UP 150 sec	Easy
PYQ 2026-May [79] · Pg 665	SET UP 150 sec	Easy
PYQ 2018-May [38] · Pg 626	SET UP 150 sec	Medium
PYQ 2018-May [39] · Pg 627	SET UP 150 sec	Medium
PYQ 2018-May [40] · Pg 627	SET UP 150 sec	Medium
PYQ 2018-May [47] · Pg 628	SET UP 150 sec	Medium
PYQ 2018-Nov [48] · Pg 628	SET UP 150 sec	Medium
PYQ 2019-Jun [46] · Pg 629	SET UP 150 sec	Medium
PYQ 2019-Jun [47] · Pg 629	SET UP 150 sec	Medium
PYQ 2019-Nov [50] · Pg 630	SET UP 150 sec	Medium
PYQ 2019-Nov [52] · Pg 631	SET UP 150 sec	Medium
PYQ 2020-Nov [46] · Pg 631	SET UP 150 sec	Medium

PYQ 2021-Jan [43] · Pg 632	SET UP 150 sec	Medium
PYQ 2021-Jan [44] · Pg 633	SET UP 150 sec	Medium
PYQ 2021-Jan [46] · Pg 634	SET UP 150 sec	Medium
PYQ 2021-Jul [49] · Pg 634 asked 2×	SET UP 150 sec	Medium
PYQ 2021-Jul [50] · Pg 634	SET UP 150 sec	Medium
PYQ 2021-Jul [51] · Pg 635	SET UP 150 sec	Medium
PYQ 2021-Dec [50] · Pg 635	SET UP 150 sec	Medium
PYQ 2022-Jun [53] · Pg 637	SET UP 150 sec	Medium
PYQ 2022-Dec [49] · Pg 637	SET UP 150 sec	Medium
PYQ 2022-Dec [50] · Pg 638	SET UP 150 sec	Medium
PYQ 2023-Jun [51] · Pg 639	SET UP 150 sec	Medium
PYQ 2023-Jun [52] · Pg 639	SET UP 150 sec	Medium
PYQ 2023-Dec [47] · Pg 640	SET UP 150 sec	Medium
PYQ 2023-Dec [50] · Pg 642	SET UP 150 sec	Medium
PYQ 2023-Dec [51] · Pg 642	SET UP 150 sec	Medium
PYQ 2024-Jun [52] · Pg 643	SET UP 150 sec	Medium
PYQ 2024-Jun [53] · Pg 644	SET UP 150 sec	Medium
PYQ 2024-Jun [54] · Pg 644	SET UP 150 sec	Medium
MTP 2024-Jun S3 [51] · Pg 644 asked 2×	SET UP 150 sec	Medium
MTP 2024-Jun S3 [52] · Pg 645	SET UP 150 sec	Medium
MTP 2024-Aug S2 [56] · Pg 645	SET UP 150 sec	Medium
MTP 2024-Aug S2 [57] · Pg 645	SET UP 150 sec	Medium
MTP 2024-Aug S2 [58] · Pg 645	SET UP 150 sec	Medium

MTP 2024-Aug S2 [59] · Pg 646 asked 2×	SET UP 150 sec	Medium
MTP 2024-Aug S2 [60] · Pg 646 asked 2×	SET UP 150 sec	Medium
PYQ 2024-Sep [75] · Pg 646	SET UP 150 sec	Medium
PYQ 2024-Sep [79] · Pg 647	SET UP 150 sec	Medium
PYQ 2024-Sep [81] · Pg 648	SET UP 150 sec	Medium
PYQ 2024-Sep [82] · Pg 648	SET UP 150 sec	Medium
PYQ 2024-Sep [83] · Pg 648	SET UP 150 sec	Medium
MTP 2024-Dec S1 [52] · Pg 649	SET UP 150 sec	Medium
MTP 2024-Dec S1 [53] · Pg 649	SET UP 150 sec	Medium
MTP 2024-Dec S1 [54] · Pg 649	SET UP 150 sec	Medium
PYQ 2025-Jan [75] · Pg 650	SET UP 150 sec	Medium
PYQ 2025-Jan [79] · Pg 653 asked 2×	SET UP 150 sec	Medium
MTP 2025-Jan S2 [53] · Pg 654	SET UP 150 sec	Medium
MTP 2025-Jan S2 [54] · Pg 654	SET UP 150 sec	Medium
MTP 2025-Jan S2 [55] · Pg 654	SET UP 150 sec	Medium
MTP 2025-Jan S2 [56] · Pg 654	SET UP 150 sec	Medium
PYQ 2025-May [55] · Pg 655	SET UP 150 sec	Medium
PYQ 2025-May [52] · Pg 655	SET UP 150 sec	Medium
PYQ 2025-May [50] · Pg 658	SET UP 150 sec	Medium
PYQ 2025-Sep [51] · Pg 659	SET UP 150 sec	Medium
PYQ 2025-Sep [52] · Pg 660	SET UP 150 sec	Medium
PYQ 2025-Sep [54] · Pg 660	SET UP 150 sec	Medium
PYQ 2025-Sep [53] · Pg 660	SET UP 150 sec	Medium

PYQ 2026-Jan [25] · Pg 661 asked 2×	SET UP 150 sec	Medium
PYQ 2026-Jan [75] · Pg 663	SET UP 150 sec	Medium
MTP 2026-Apr S1 [51] · Pg 663	SET UP 150 sec	Medium
MTP 2026-Apr S1 [52] · Pg 663	SET UP 150 sec	Medium
MTP 2026-Apr S1 [54] · Pg 663	SET UP 150 sec	Medium
MTP 2026-Apr S2 [53] · Pg 664	SET UP 150 sec	Medium
PYQ 2026-May [80] · Pg 666	SET UP 150 sec	Medium
PYQ 2026-May [26] · Pg 666	SET UP 150 sec	Medium
PYQ 2026-Sep [40] · Pg 666	SET UP 150 sec	Medium
PYQ 2026-Sep [63] · Pg 667	SET UP 150 sec	Medium
PYQ 2026-Sep [64] · Pg 667	SET UP 150 sec	Medium
PYQ 2026-Sep [65] · Pg 667	SET UP 150 sec	Medium
PYQ 2026-Sep [88] · Pg 667	SET UP 150 sec	Medium
PYQ 2018-Nov [46] · Pg 627	SET UP 150 sec	Hard
PYQ 2018-Nov [49] · Pg 628	SET UP 150 sec	Hard
PYQ 2020-Nov [47] · Pg 631	SET UP 150 sec	Hard
PYQ 2021-Jan [45] · Pg 633	SET UP 150 sec	Hard
PYQ 2021-Dec [52] · Pg 636	SET UP 150 sec	Hard
PYQ 2021-Dec [53] · Pg 636	SET UP 150 sec	Hard
PYQ 2023-Jun [53] · Pg 640	SET UP 150 sec	Hard
PYQ 2023-Dec [48] · Pg 640	SET UP 150 sec	Hard
PYQ 2024-Jun [50] · Pg 642	SET UP 150 sec	Hard
PYQ 2024-Jun [51] · Pg 643	SET UP 150 sec	Hard

PYQ 2024-Sep [80] · Pg 647	SET UP 150 sec	Hard
MTP 2024-Dec S1 [51] · Pg 648	SET UP 150 sec	Hard
PYQ 2025-Jan [78] · Pg 652 asked 2×	SET UP 150 sec	Hard
PYQ 2025-May [53] · Pg 656	SET UP 150 sec	Hard
PYQ 2025-May [51] · Pg 659	SET UP 150 sec	Hard
PYQ 2025-Sep [55] · Pg 660	SET UP 150 sec	Hard
PYQ 2026-Jan [24] · Pg 662	SET UP 150 sec	Hard
PYQ 2026-May [81] · Pg 664	SET UP 150 sec	Hard

CHAPTER 12

Blood Relations

1 Topics · 118 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **SET UP** · 150 sec a question on average — **slower than the paper**

SET UP Analysis**100.0%**

150 sec

96 of 96 past-exam questions

Topic 1: Introduction

P3-C12-U12-T01

Read first Study Chapter 12 (Blood Relations): the paternal-side and maternal-side relation lists (12.1), the relation table (grandfather's only son = father, son's wife = daughter-in-law, brother's son = nephew, sister's husband = brother-in-law, etc.) and the worked question types, including coded-relation problems.

SET UP **150 sec** set it up before you compute · 118 questions Analysis · Level II

- Decode narrated chains from the inside out: 'father's wife's only brother's son' — father's wife = mother, mother's brother = maternal uncle, uncle's son = cousin; translate one phrase at a time.
- Draw a family tree with vertical lines for parent-child, horizontal for spouses, gender marked on every node; classic trap — 'brothers and sisters I have none, he is my father's son' means the speaker himself.
- For symbol codes (P + Q means P is mother of Q, etc.), convert the given expression into a mini tree, test each option the same way, and reject options whose required gender the code does not fix.
- Watch gender ambiguity: prefer 'cousin' over 'brother' unless sex is stated, and memorise in-law mappings (wife's/husband's brother = brother-in-law, son's wife = daughter-in-law) — options exploit these.

PYQ 2018-May [43] · Pg 671

SET UP
150 sec**Easy**

PYQ 2018-May [5] · Pg 671 asked 2×

SET UP
150 sec**Easy**

PYQ 2020-Nov [49] · Pg 676

SET UP
150 sec**Easy**

PYQ 2021-Jul [55] · Pg 679

SET UP
150 sec**Easy**

PYQ 2021-Dec [57] · Pg 681 asked 2×

SET UP
150 sec**Easy**

PYQ 2022-Jun [57] · Pg 684

SET UP
150 sec**Easy**

PYQ 2023-Jun [56] · Pg 688	SET UP 150 sec	Easy
PYQ 2023-Jun [57] · Pg 689	SET UP 150 sec	Easy
PYQ 2023-Jun [58] · Pg 689	SET UP 150 sec	Easy
PYQ 2023-Dec [55] · Pg 691	SET UP 150 sec	Easy
PYQ 2024-Jun [56] · Pg 693 asked 2×	SET UP 150 sec	Easy
MTP 2024-Jun S3 [53] · Pg 696 asked 2×	SET UP 150 sec	Easy
MTP 2024-Jun S3 [55] · Pg 696 asked 2×	SET UP 150 sec	Easy
MTP 2024-Jun S3 [57] · Pg 696	SET UP 150 sec	Easy
PYQ 2024-Sep [84] · Pg 697	SET UP 150 sec	Easy
RTP 2024-Sep [17] · Pg 700 asked 2×	SET UP 150 sec	Easy
PYQ 2025-Jan [76] · Pg 701 asked 3×	SET UP 150 sec	Easy
PYQ 2025-Jan [77] · Pg 701	SET UP 150 sec	Easy
PYQ 2025-Jan [84] · Pg 702 asked 2×	SET UP 150 sec	Easy
MTP 2025-Jan S2 [48] · Pg 703	SET UP 150 sec	Easy
PYQ 2025-Sep [60] · Pg 710	SET UP 150 sec	Easy
PYQ 2026-Jan [81] · Pg 711	SET UP 150 sec	Easy
PYQ 2026-Jan [80] · Pg 712	SET UP 150 sec	Easy
PYQ 2026-May [30] · Pg 714	SET UP 150 sec	Easy
PYQ 2018-May [41] · Pg 670	SET UP 150 sec	Medium
PYQ 2018-May [42] · Pg 670	SET UP 150 sec	Medium
PYQ 2018-Nov [52] · Pg 672	SET UP 150 sec	Medium
PYQ 2019-Jun [48] · Pg 672	SET UP 150 sec	Medium
PYQ 2019-Jun [49] · Pg 673	SET UP 150 sec	Medium

PYQ 2019-Jun [50] · Pg 673	SET UP 150 sec	Medium
PYQ 2019-Jun [51] · Pg 673	SET UP 150 sec	Medium
PYQ 2019-Nov [53] · Pg 674	SET UP 150 sec	Medium
PYQ 2019-Nov [54] · Pg 674	SET UP 150 sec	Medium
PYQ 2019-Nov [55] · Pg 674	SET UP 150 sec	Medium
PYQ 2020-Nov [48] · Pg 675	SET UP 150 sec	Medium
PYQ 2020-Nov [50] · Pg 676	SET UP 150 sec	Medium
PYQ 2020-Nov [51] · Pg 676	SET UP 150 sec	Medium
PYQ 2021-Jan [47] · Pg 677	SET UP 150 sec	Medium
PYQ 2021-Jan [48] · Pg 677	SET UP 150 sec	Medium
PYQ 2021-Jan [49] · Pg 678 asked 2×	SET UP 150 sec	Medium
PYQ 2021-Jul [52] · Pg 678	SET UP 150 sec	Medium
PYQ 2021-Jul [53] · Pg 678	SET UP 150 sec	Medium
PYQ 2021-Jul [54] · Pg 679 asked 2×	SET UP 150 sec	Medium
PYQ 2021-Dec [55] · Pg 680 asked 2×	SET UP 150 sec	Medium
PYQ 2021-Dec [56] · Pg 680 asked 2×	SET UP 150 sec	Medium
PYQ 2021-Dec [60] · Pg 682	SET UP 150 sec	Medium
PYQ 2022-Jun [55] · Pg 682	SET UP 150 sec	Medium
PYQ 2022-Jun [58] · Pg 684	SET UP 150 sec	Medium
PYQ 2022-Dec [53] · Pg 685	SET UP 150 sec	Medium
PYQ 2022-Dec [54] · Pg 685	SET UP 150 sec	Medium
PYQ 2022-Dec [55] · Pg 685	SET UP 150 sec	Medium
PYQ 2022-Dec [56] · Pg 686	SET UP 150 sec	Medium

PYQ 2022-Dec [57] · Pg 686	SET UP 150 sec	Medium
PYQ 2022-Dec [58] · Pg 687 asked 2×	SET UP 150 sec	Medium
PYQ 2023-Jun [54] · Pg 687	SET UP 150 sec	Medium
PYQ 2023-Dec [52] · Pg 690	SET UP 150 sec	Medium
PYQ 2023-Dec [53] · Pg 690	SET UP 150 sec	Medium
PYQ 2023-Dec [54] · Pg 691	SET UP 150 sec	Medium
PYQ 2023-Dec [56] · Pg 692	SET UP 150 sec	Medium
PYQ 2023-Dec [57] · Pg 692	SET UP 150 sec	Medium
PYQ 2024-Jun [57] · Pg 694	SET UP 150 sec	Medium
PYQ 2024-Jun [59] · Pg 695	SET UP 150 sec	Medium
MTP 2024-Jun S3 [54] · Pg 696	SET UP 150 sec	Medium
MTP 2024-Jun S3 [56] · Pg 696 asked 2×	SET UP 150 sec	Medium
MTP 2024-Aug S2 [47] · Pg 697	SET UP 150 sec	Medium
MTP 2024-Aug S2 [48] · Pg 697	SET UP 150 sec	Medium
MTP 2024-Aug S2 [49] · Pg 697	SET UP 150 sec	Medium
MTP 2024-Aug S2 [50] · Pg 697	SET UP 150 sec	Medium
PYQ 2024-Sep [85] · Pg 698 asked 2×	SET UP 150 sec	Medium
PYQ 2024-Sep [89] · Pg 699	SET UP 150 sec	Medium
PYQ 2024-Sep [90] · Pg 699	SET UP 150 sec	Medium
MTP 2024-Dec S1 [57] · Pg 700	SET UP 150 sec	Medium
MTP 2024-Dec S1 [58] · Pg 700	SET UP 150 sec	Medium
MTP 2024-Dec S1 [59] · Pg 700	SET UP 150 sec	Medium
MTP 2024-Dec S1 [60] · Pg 701	SET UP 150 sec	Medium

PYQ 2025-Jan [83] · Pg 701 asked 2×	SET UP 150 sec	Medium
PYQ 2025-Jan [85] · Pg 702	SET UP 150 sec	Medium
RTP 2025-Jan [18] · Pg 702	SET UP 150 sec	Medium
MTP 2025-Jan S2 [47] · Pg 703 asked 2×	SET UP 150 sec	Medium
MTP 2025-Jan S2 [49] · Pg 703 asked 2×	SET UP 150 sec	Medium
MTP 2025-Jan S2 [51] · Pg 703	SET UP 150 sec	Medium
MTP 2025-Jan S2 [52] · Pg 704	SET UP 150 sec	Medium
PYQ 2025-May [56] · Pg 706	SET UP 150 sec	Medium
PYQ 2025-May [57] · Pg 707	SET UP 150 sec	Medium
PYQ 2025-Sep [57] · Pg 707	SET UP 150 sec	Medium
PYQ 2025-Sep [59] · Pg 708	SET UP 150 sec	Medium
PYQ 2025-Sep [56] · Pg 709 asked 2×	SET UP 150 sec	Medium
PYQ 2026-Jan [78] · Pg 712	SET UP 150 sec	Medium
PYQ 2026-Jan [79] · Pg 712	SET UP 150 sec	Medium
MTP 2026-Apr S1 [56] · Pg 713	SET UP 150 sec	Medium
PYQ 2026-May [31] · Pg 713	SET UP 150 sec	Medium
PYQ 2026-May [27] · Pg 714	SET UP 150 sec	Medium
PYQ 2026-May [28] · Pg 715	SET UP 150 sec	Medium
PYQ 2026-May [29] · Pg 715	SET UP 150 sec	Medium
PYQ 2026-Sep [15] · Pg 716	SET UP 150 sec	Medium
PYQ 2026-Sep [17] · Pg 716	SET UP 150 sec	Medium
PYQ 2026-Sep [18] · Pg 716	SET UP 150 sec	Medium
PYQ 2026-Sep [41] · Pg 716	SET UP 150 sec	Medium

PYQ 2026-Sep [42] · Pg 717	SET UP 150 sec	Medium
PYQ 2018-Nov [50] · Pg 671	SET UP 150 sec	Hard
PYQ 2018-Nov [51] · Pg 672	SET UP 150 sec	Hard
PYQ 2020-Nov [52] · Pg 676	SET UP 150 sec	Hard
PYQ 2021-Dec [59] · Pg 681	SET UP 150 sec	Hard
PYQ 2022-Jun [54] · Pg 682	SET UP 150 sec	Hard
PYQ 2022-Jun [56] · Pg 683	SET UP 150 sec	Hard
PYQ 2022-Dec [52] · Pg 684	SET UP 150 sec	Hard
PYQ 2023-Jun [55] · Pg 688	SET UP 150 sec	Hard
PYQ 2023-Jun [59] · Pg 690	SET UP 150 sec	Hard
PYQ 2023-Dec [58] · Pg 692 asked 3x	SET UP 150 sec	Hard
PYQ 2024-Jun [55] · Pg 693	SET UP 150 sec	Hard
PYQ 2024-Jun [58] · Pg 695	SET UP 150 sec	Hard
MTP 2024-Aug S2 [46] · Pg 696	SET UP 150 sec	Hard
PYQ 2024-Sep [88] · Pg 698	SET UP 150 sec	Hard
PYQ 2025-May [58] · Pg 704	SET UP 150 sec	Hard
PYQ 2025-May [59] · Pg 705	SET UP 150 sec	Hard
PYQ 2025-May [60] · Pg 706	SET UP 150 sec	Hard
PYQ 2025-Sep [58] · Pg 708 asked 2x	SET UP 150 sec	Hard
PYQ 2026-Jan [29] · Pg 710	SET UP 150 sec	Hard

CHAPTER 13.1

Statistical Description of Data

5 Topics • 127 Classified Questions • Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **RECALL** • 41 sec a question on average — **faster than the paper**

RECALL Remembering	63.3%	30 sec	69 of 109 past-exam questions
RECOGNISE Understanding	24.8%	45 sec	27 of 109 past-exam questions
COMPUTE Application	9.2%	75 sec	10 of 109 past-exam questions
SET UP Analysis	2.8%	150 sec	3 of 109 past-exam questions

Topic 1: Introduction of Statistics

P3-C13.1-U13.1-T01

Read first Read the opening sections of Unit 1 (Statistical Description of Data): history and definition of Statistics (singular vs plural sense), applications in Economics/Business, and limitations of Statistics.

RECALL 30 sec know it or move on • 3 questions Remembering • Level I

- Statistics (singular sense) = the scientific method of collecting, analysing and presenting data and drawing inferences — the 'science of counting' or 'science of averages'; (plural sense) = the data themselves, qualitative as well as quantitative.
- Statistics is concerned with quantitative information, and with qualitative information only when it can be numerically expressed — so 'both (a) and (b)' type options are the standard answer.
- Line charts/graphs of two series (multiple line chart) are the usual device for examining the relationship between two variables over time.

PYQ 2020-Nov [58] • Pg 723	RECALL 30 sec	Easy
MTP 2024-Jun S3 [71] • Pg 723	RECALL 30 sec	Easy
MTP 2025-Jan S2 [64] • Pg 723 asked 4×	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies • 2 questions Understanding • Level I

- Statistics deals with aggregates, not individuals: an 'average salary of Rs 47,000' is a statement about the group, true on the average, not about any single worker.
- Statistics cannot deal with textual/undetailed or purely qualitative descriptions directly — attributes must first be converted into counts or numbers.

- Know the limitations: statistical results are true only on an average, and can be misused if data are incomplete.

PYQ 2020-Nov [53] · Pg 722

RECOGNISE
45 sec

Easy

PYQ 2020-Nov [54] · Pg 722

RECOGNISE
45 sec

Easy

Topic 2: Collection of Data

P3-C13.1-U13.1-T02

Read first Study the 'Collection of Data' section: primary vs secondary data, methods of collecting primary data (interview methods, mailed questionnaire, observation), sources of secondary data, and scrutiny of data; also the definitions of variable (discrete/continuous) and attribute.

RECALL 30 sec know it or move on · 13 questions Remembering · Level I

- Primary data = collected by the investigator himself for the enquiry; secondary data = data already collected by others (census reports, government records, research articles, journals, international sources like World Bank).
- Interview methods for primary data: personal interview, indirect interview and telephone interview; mailed questionnaire and observation method are the other primary methods.
- Scrutiny (internal consistency checks plus intelligence, patience and experience) verifies accuracy and consistency of data — there are no hard-and-fast rules.
- Cumulative frequency is of 2 types: less-than and more-than.

PYQ 2020-Nov [55] · Pg 723

RECALL
30 sec

Easy

PYQ 2020-Nov [56] · Pg 724

RECALL
30 sec

Easy

PYQ 2021-Jan [53] · Pg 724

RECALL
30 sec

Easy

PYQ 2022-Jun [60] · Pg 724

RECALL
30 sec

Easy

PYQ 2022-Dec [59] · Pg 724

RECALL
30 sec

Easy

MTP 2024-Jun S3 [86] · Pg 725

RECALL
30 sec

Easy

MTP 2024-Aug S2 [62] · Pg 725

RECALL
30 sec

Easy

PYQ 2024-Sep [86] · Pg 725 asked 2×

RECALL
30 sec

Easy

PYQ 2025-Sep [62] · Pg 725

RECALL
30 sec

Easy

RTP 2024-Sep [27] · Pg 726 asked 2×	RECALL 30 sec	Easy
MTP 2025-Jan S2 [62] · Pg 727 asked 3×	RECALL 30 sec	Easy
PYQ 2026-May [32] · Pg 727	RECALL 30 sec	Easy
PYQ 2026-May [84] · Pg 727	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 3 questions Understanding · Level I

- Distinguish attribute (qualitative, e.g. nationality, sweetness) from discrete variable (counts, e.g. number of students) and continuous variable (measurements, e.g. profits of a company over years).
- A pie chart is the right diagram for partitioning a total into components (e.g. heads of total cost); for manifold classification, textual presentation is NOT recommended — use a table.

PYQ 2018-Nov [55] · Pg 723	RECOGNISE 45 sec	Easy
PYQ 2021-Jul [62] · Pg 724	RECOGNISE 45 sec	Easy
PYQ 2025-Sep [63] · Pg 726	RECOGNISE 45 sec	Easy

SET UP 150 sec break down and compare · 1 question Analysis · Level II

MTP 2024-Dec S1 [63] · Pg 726	SET UP 150 sec	Medium
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Topic 3: Presentation of Data

P3-C13.1-U13.1-T03

Read first Read 'Presentation of Data': textual and tabular presentation (parts of a table — caption, box-head, stub, body, footnote) and diagrammatic representation (line diagram, bar diagram, pie chart, pictograph).

RECALL 30 sec know it or move on · 26 questions Remembering · Level I

- Modes of presentation: textual, tabular and diagrammatic. A table has FOUR parts — caption (upper part describing columns), box-head (entire upper part including caption and units of measurement), stub (left part describing rows), body (main data part); source/footnote appears at the bottom.
- Bar diagram is 1-dimensional, pie diagram 2-dimensional, cube diagram 3-dimensional (order 1,2,3). Ideographs = picto-graphs; vertical bars = bar chart/vertical bar graph.
- Pie chart suits categorical data showing shares of a total; numerical data in descriptive form = textual presentation.

PYQ 2020-Nov [59] · Pg 728	RECALL 30 sec	Easy
PYQ 2021-Jan [50] · Pg 729	RECALL 30 sec	Easy
PYQ 2021-Jan [52] · Pg 730	RECALL 30 sec	Easy
PYQ 2021-Jan [59] · Pg 730	RECALL 30 sec	Easy
PYQ 2021-Jul [56] · Pg 730	RECALL 30 sec	Easy
PYQ 2021-Jul [57] · Pg 730	RECALL 30 sec	Easy
PYQ 2021-Jul [58] · Pg 730	RECALL 30 sec	Easy
PYQ 2021-Dec [62] · Pg 731	RECALL 30 sec	Easy
PYQ 2022-Jun [61] · Pg 732 asked 2×	RECALL 30 sec	Easy
PYQ 2022-Jun [62] · Pg 732	RECALL 30 sec	Easy
PYQ 2022-Jun [66] · Pg 732	RECALL 30 sec	Easy
PYQ 2023-Jun [62] · Pg 733	RECALL 30 sec	Easy
PYQ 2023-Jun [63] · Pg 734	RECALL 30 sec	Easy
MTP 2024-Aug S2 [64] · Pg 735 asked 3×	RECALL 30 sec	Easy
PYQ 2024-Sep [92] · Pg 735	RECALL 30 sec	Easy
PYQ 2024-Sep [98] · Pg 735	RECALL 30 sec	Easy
MTP 2024-Dec S1 [62] · Pg 736	RECALL 30 sec	Easy
MTP 2024-Dec S1 [64] · Pg 736	RECALL 30 sec	Easy
MTP 2024-Dec S1 [65] · Pg 736	RECALL 30 sec	Easy
PYQ 2025-Jan [89] · Pg 736 asked 2×	RECALL 30 sec	Easy
PYQ 2025-May [69] · Pg 737	RECALL 30 sec	Easy
PYQ 2025-Sep [64] · Pg 738	RECALL 30 sec	Easy
PYQ 2026-Jan [30] · Pg 738	RECALL 30 sec	Easy

PYQ 2026-May [83] · Pg 738	RECALL 30 sec	Easy
PYQ 2026-Sep [66] · Pg 739	RECALL 30 sec	Easy
PYQ 2026-Sep [92] · Pg 740	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 8 questions · Understanding · Level I

- Ogives can give median/quartiles but never the mean; multiple-axis line chart is used when the units of the variables differ.
- Tabulation can handle attribute data, time-series data and continuous series alike — it is the most general mode; a histogram and a pie chart of the same data convey distribution vs composition respectively.

PYQ 2020-Nov [60] · Pg 728	RECOGNISE 45 sec	Easy
PYQ 2021-Jan [51] · Pg 729	RECOGNISE 45 sec	Easy
PYQ 2021-Dec [64] · Pg 731	RECOGNISE 45 sec	Easy
PYQ 2021-Dec [67] · Pg 731	RECOGNISE 45 sec	Easy
PYQ 2022-Jun [64] · Pg 732	RECOGNISE 45 sec	Easy
PYQ 2024-Jun [64] · Pg 735	RECOGNISE 45 sec	Easy
MTP 2024-Jun S3 [98] · Pg 735	RECOGNISE 45 sec	Easy
PYQ 2024-Jun [63] · Pg 734	RECOGNISE 45 sec	Medium

COMPUTE 75 sec one formula, straight through · 5 questions · Application · Level II

- Central angle of a pie-chart sector = (component value / total) x 360 degrees; e.g. a 25% share gives 90 degrees.
- For marks/cost-heads/shareholding data, first total all components, then convert each to degrees (or percentage) before answering.

PYQ 2025-Jan [99] · Pg 737	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [63] · Pg 737 asked 3×	COMPUTE 75 sec	Easy
PYQ 2021-Dec [63] · Pg 731	COMPUTE 75 sec	Medium
PYQ 2023-Jun [60] · Pg 733	COMPUTE 75 sec	Medium

MTP 2025-Jan S2 [61] · Pg 737

COMPUTE
75 sec**Medium**

Topic 4: Frequency Distribution

P3-C13.1-U13.1-T04

Read first Study 'Frequency Distribution': class limits vs boundaries, class length, mid-point, exclusive vs inclusive classification, frequency density, relative frequency and cumulative frequency.

RECALL 30 sec know it or move on · 14 questions Remembering · Level I

- Frequency density of a class = $\text{class frequency} / \text{class length}$; relative frequency = $\text{class frequency} / \text{TOTAL frequency}$ (and lies between 0 and 1).
- Class interval = upper limit minus lower limit; number of class intervals $\times$ class length is approximately the range, and the number of classes is about $1 + 3.322 \log N$ (Sturges' formula).
- The point of intersection of the less-than and more-than ogives gives the MEDIAN; a series with continuously added frequencies is a cumulative frequency series.

PYQ 2018-Nov [53] · Pg 740	RECALL 30 sec	Easy
PYQ 2018-Nov [57] · Pg 741	RECALL 30 sec	Easy
PYQ 2019-Jun [54] · Pg 741	RECALL 30 sec	Easy
PYQ 2021-Jul [61] · Pg 742	RECALL 30 sec	Easy
PYQ 2021-Dec [66] · Pg 744	RECALL 30 sec	Easy
PYQ 2022-Dec [61] · Pg 744	RECALL 30 sec	Easy
PYQ 2023-Dec [63] · Pg 746	RECALL 30 sec	Easy
PYQ 2023-Dec [64] · Pg 746	RECALL 30 sec	Easy
PYQ 2024-Sep [95] · Pg 747	RECALL 30 sec	Easy
MTP 2024-Aug S2 [63] · Pg 747 asked 2×	RECALL 30 sec	Easy
PYQ 2025-May [62] · Pg 748	RECALL 30 sec	Easy
PYQ 2026-Jan [28] · Pg 749	RECALL 30 sec	Easy
PYQ 2026-Sep [16] · Pg 750	RECALL 30 sec	Easy

PYQ 2026-Sep [93] · Pg 750

RECALL
30 sec**Easy****RECOGNISE 45 sec** decide which idea applies · 2 questions · Understanding · Level I

- Exclusive (mutually exclusive/overlapping) classification like 10-20, 20-30 excludes the upper class limit and suits continuous variables; inclusive classification like 10-19, 20-29 includes both limits and suits discrete data.
- Open-ended series have no lower limit of the first class or upper limit of the last class.

PYQ 2020-Nov [57] · Pg 741

RECOGNISE
45 sec**Easy**

PYQ 2026-May [87] · Pg 749

RECOGNISE
45 sec**Easy****COMPUTE 75 sec** one formula, straight through · 7 questions · Application · Level II

- Convert 'below x' or 'more than x' cumulative totals into ordinary class frequencies by successive subtraction before answering anything.
- For inclusive classes (10-14, 15-19...), class boundaries = limits ± 0.5 (i.e. 9.5- 14.5); number of classes = range / class length (round up).
- To count observations between two values, add the relevant class frequencies after converting cumulative data.

PYQ 2021-Jul [59] · Pg 741

COMPUTE
75 sec**Easy**

PYQ 2023-Dec [60] · Pg 745

COMPUTE
75 sec**Easy**

PYQ 2024-Sep [99] · Pg 747

COMPUTE
75 sec**Easy**

PYQ 2025-May [64] · Pg 748

COMPUTE
75 sec**Easy**

PYQ 2023-Jun [61] · Pg 745 asked 2×

COMPUTE
75 sec**Medium**

PYQ 2023-Dec [61] · Pg 746

COMPUTE
75 sec**Medium**

RTP 2024-Sep [19] · Pg 747 asked 3×

COMPUTE
75 sec**Medium****SET UP 150 sec** set it up before you compute · 3 questions · Analysis · Level II

- Two-attribute problems (male/female x married/unmarried, workers x song- enjoyed): set up a 2x2 table, enter given totals, fill remaining cells by subtraction.
- Convert percentage splits to absolute numbers before cross-classifying.

PYQ 2021-Jul [60] · Pg 742

SET UP
150 sec**Medium**

PYQ 2021-Dec [61] · Pg 742

SET UP
150 sec**Medium**

PYQ 2025-Jan [88] · Pg 748 asked 3×

SET UP
150 sec**Medium**

Topic 5: Graphical Representation of Frequency Distribution

P3-C13.1-U13.1-T05

Read first Read 'Graphical Representation of a Frequency Distribution': histogram, frequency polygon, ogives (less-than and more-than) and the shapes of frequency curves (bell-shaped, U-shaped, J-shaped, mixed).

RECALL 30 sec know it or move on · 26 questions Remembering · Level I

- Histogram gives MODE graphically (rectangles on class intervals; use frequency density when class lengths are unequal); ogives give MEDIAN and quartiles; ogive = graph of cumulative frequency plotted against class boundaries.
- Histograms need exclusive (overlapping) class intervals; the number of times an item occurs in a class is its frequency.
- Curve shapes: bell-shaped is most common (frequency peaks near the middle); U-shaped has minimum at the centre; J-shaped starts minimum and peaks at the right end — a blue-chip company's profitability shows a J-shaped curve.

PYQ 2018-May [46] · Pg 750

RECALL
30 sec**Easy**

PYQ 2018-Nov [54] · Pg 751

RECALL
30 sec**Easy**

PYQ 2018-Nov [56] · Pg 751

RECALL
30 sec**Easy**

PYQ 2019-Jun [53] · Pg 752

RECALL
30 sec**Easy**

PYQ 2019-Jun [55] · Pg 752

RECALL
30 sec**Easy**

PYQ 2019-Jun [56] · Pg 752

RECALL
30 sec**Easy**

PYQ 2019-Nov [56] · Pg 752

RECALL
30 sec**Easy**

PYQ 2019-Nov [57] · Pg 753

RECALL
30 sec**Easy**

PYQ 2021-Jan [56] · Pg 753 asked 2×

RECALL
30 sec**Easy**

PYQ 2021-Jan [57] · Pg 753

RECALL
30 sec**Easy**

PYQ 2021-Jan [58] · Pg 754

RECALL
30 sec**Easy**

PYQ 2022-Jun [59] · Pg 754	RECALL 30 sec	Easy
PYQ 2022-Jun [65] · Pg 754	RECALL 30 sec	Easy
PYQ 2023-Dec [59] · Pg 755	RECALL 30 sec	Easy
PYQ 2023-Dec [62] · Pg 755	RECALL 30 sec	Easy
PYQ 2023-Dec [65] · Pg 755	RECALL 30 sec	Easy
MTP 2024-Aug S2 [66] · Pg 756 asked 2×	RECALL 30 sec	Easy
MTP 2024-Dec S1 [61] · Pg 758	RECALL 30 sec	Easy
PYQ 2025-Jan [93] · Pg 758 asked 2×	RECALL 30 sec	Easy
PYQ 2025-May [63] · Pg 758	RECALL 30 sec	Easy
PYQ 2025-May [61] · Pg 759	RECALL 30 sec	Easy
PYQ 2025-May [68] · Pg 759	RECALL 30 sec	Easy
PYQ 2026-Jan [33] · Pg 762	RECALL 30 sec	Easy
PYQ 2026-Jan [83] · Pg 762	RECALL 30 sec	Easy
PYQ 2026-May [33] · Pg 762	RECALL 30 sec	Easy
PYQ 2026-Sep [91] · Pg 763	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 13 questions Understanding · Level I

- Less-than ogive: plot less-than cumulative frequencies against upper class boundaries; more-than ogive uses more-than cumulative frequencies; ogives serve SHORT-term projections and quartile location.
- A histogram approximates mode (not standard deviation); to compare two distributions on one set of axes, draw frequency polygons.
- Bar charts suit categorical comparisons (disciplines, sales-persons); one criterion of classification = simple/one-way classification.

PYQ 2018-May [47] · Pg 751	RECOGNISE 45 sec	Easy
PYQ 2021-Jan [54] · Pg 753	RECOGNISE 45 sec	Easy
PYQ 2022-Jun [63] · Pg 754	RECOGNISE 45 sec	Easy

PYQ 2023-Jun [64] · Pg 754	RECOGNISE 45 sec	Easy
PYQ 2024-Jun [60] · Pg 755	RECOGNISE 45 sec	Easy
PYQ 2024-Jun [61] · Pg 756	RECOGNISE 45 sec	Easy
PYQ 2024-Jun [62] · Pg 756	RECOGNISE 45 sec	Easy
PYQ 2024-Jun [65] · Pg 756	RECOGNISE 45 sec	Easy
PYQ 2024-Sep [91] · Pg 757	RECOGNISE 45 sec	Easy
PYQ 2024-Sep [93] · Pg 757	RECOGNISE 45 sec	Easy
PYQ 2025-Sep [67] · Pg 760	RECOGNISE 45 sec	Easy
PYQ 2025-Sep [68] · Pg 761	RECOGNISE 45 sec	Easy
PYQ 2025-Sep [69] · Pg 761	RECOGNISE 45 sec	Easy

COMPUTE 75 sec one formula, straight through · 1 question Application · Level II

- Cumulative frequency of a class = sum of all frequencies up to and including that class — compute it before reading any ogive question.
- A perpendicular from the intersection of the two ogives to the x-axis gives the median value; quartiles are read the same way at $N/4$ and $3N/4$.

PYQ 2018-Nov [58] · Pg 751	COMPUTE 75 sec	Easy
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CHAPTER 13.2

Sampling

5 Topics · 29 Classified Questions · Importance: C

WHAT THIS CHAPTER ASKS FOR mostly **RECALL** · 38 sec a question on average — **faster than the paper**

RECALL Remembering	63.0%	30 sec	17 of 27 past-exam questions
RECOGNISE Understanding	29.6%	45 sec	8 of 27 past-exam questions
COMPUTE Application	7.4%	75 sec	2 of 27 past-exam questions

Topic 1: Introduction

P3-C13.2-U13.2-T01

CONCEPT BASE — no exam question asked yet · essential for full preparation

Read first Read section 13.2.1 (Introduction to Sampling): meaning of population and sample, why sample surveys are preferred over complete enumeration (census), and everyday examples of sampling.

RECALL 30 sec know it or move on — no question in this edition Remembering · Level I

- Sampling lets us know the characteristics of the POPULATION (universe) by examining only a small, representative part of it.
- A sample is a part of the population so selected as to represent the population in ALL its characteristics.
- Sampling is preferred over complete enumeration when testing is destructive in nature, the population is infinite/very large, or time and cost are constraints.

RECOGNISE 45 sec decide which idea applies — no question in this edition Understanding · Level I

- Testing human blood by examining a few drops is SAMPLE investigation/survey — a classic 'identify-the-method' MCQ.
- Census (complete enumeration) examines every unit; sampling infers about the unknown universe from a random sample drawn from it.

Topic 2: Basic Principles of Survey

P3-C13.2-U13.2-T02

Read first Study section 13.2.2 (Basic Principles of Sample Survey): law of statistical regularity, principle of inertia of large numbers, principle of optimization and principle of validity.

RECALL 30 sec know it or move on · 3 questions Remembering · Level I

- Law of statistical regularity: a random sample of fairly large size drawn from the population possesses, on the average, the characteristics of that population; reliability of a statistic varies as the square root of sample size.
- The four principles: (i) statistical regularity, (ii) inertia of large numbers (larger sample gives more reliable, stable results), (iii) optimization (maximum efficiency at minimum cost), (iv) validity (design must permit valid estimates/tests — needs probability sampling).
- Systematic sampling belongs to the MIXED sampling category (partly probabilistic, partly by fixed rule).

PYQ 2025-May [65] · Pg 766

RECALL
30 sec**Easy**

PYQ 2025-Sep [61] · Pg 767

RECALL
30 sec**Easy**

PYQ 2026-Jan [82] · Pg 767

RECALL
30 sec**Easy**

Topic 3: Errors in Sampling

P3-C13.2-U13.2-T03

Read first Read sections 13.2.3-13.2.4: comparison of sample survey vs complete enumeration, and the two error types — sampling errors and non-sampling errors — with the factors causing each.

RECALL 30 sec know it or move on — no question in this edition Remembering · Level I

- Errors in a sample survey are of two types: sampling errors (arise because only a part of the population is studied — faulty frame, faulty selection/substitution, bias of enumerator, wrong method) and NON-sampling errors (all other errors: recording, non-response, processing; they occur in census too).
- Sampling error is INVERSELY proportional to the square root of the number of items in the sample.

RECOGNISE 45 sec decide which idea applies · 2 questions Understanding · Level I

- As sample size increases, sampling error DECREASES; the divergence (difference between statistic and parameter) becomes LESS as the sample size approaches the population size.
- Sampling error arises from studying only part of the population, NOT from wrong recording by enumerators — that is a non-sampling error; complete enumeration is free of sampling error but not of non-sampling error.

MTP 2024-Dec S1 [69] · Pg 768

RECOGNISE
45 sec**Easy**

PYQ 2026-May [37] · Pg 768

RECOGNISE
45 sec**Easy**

Topic 4: Some important terms associated with sampling

P3-C13.2-U13.2-T04

Read first Study section 13.2.5: population, sample, parameter vs statistic, sampling distribution, standard error (formulas 13.2.8-13.2.9 with finite population correction) and criteria of a good estimator; point vs interval estimation.

RECALL 30 sec know it or move on · 4 questions Remembering · Level I

- Parameter = characteristic of the POPULATION (all units); statistic = function of sample observations. Distribution of all possible values of a statistic = sampling distribution; its SD = STANDARD ERROR (SE), the measure of precision.
- $SE(\text{mean}) = \sigma/\sqrt{n}$ for SRSWR; multiply by $\sqrt{(N-n)/(N-1)}$ (finite population correction) for SRSWOR. Possible samples: N^n with replacement, NC_n without; $n < 30$ = small sample.
- Good estimator: unbiased ($E(T) = \text{parameter}$), consistent, efficient (least variance), sufficient; the sample mean is an unbiased, consistent (MVUE) estimator of the population mean; an unknown parameter has MANY interval estimates.

PYQ 2025-Jan [81] · Pg 769 asked 4x

RECALL
30 sec

Easy

PYQ 2026-May [86] · Pg 771

RECALL
30 sec

Easy

PYQ 2026-Sep [43] · Pg 771

RECALL
30 sec

Easy

PYQ 2026-Sep [45] · Pg 771

RECALL
30 sec

Easy

RECOGNISE 45 sec decide which idea applies · 1 question Understanding · Level I

- Sampling fluctuations = variation of a statistic from sample to sample; as n increases SE decreases (inversely proportional to $\sqrt{n}$).
- When error may be involved, use an INTERVAL estimate rather than a point estimate; SRS need not guarantee representation of every subgroup.

PYQ 2025-May [67] · Pg 769

RECOGNISE
45 sec

Medium

COMPUTE 75 sec one formula, straight through · 2 questions Application · Level II

- SE drills: $\sigma = 20$, $n = 100$ gives $SE = 2$; solve $n = (\sigma/SE)^2$; SE of proportion = $\sqrt{pq/n}$ (25 rotten of 500: $p = 0.05$, $SE \sim 0.01$).
- Counting samples: $N = 5$, $n = 2$ gives 25 WR / 10 WOR; $N = 20$, $n = 2$ gives 190 WOR.
- 95% limits = mean $\pm 1.96 SE$ (recover σ from the half-width); normal-curve points of inflexion sit at mean $\pm SD$.

PYQ 2025-Jan [98] · Pg 769

COMPUTE
75 sec**Easy**

PYQ 2025-May [66] · Pg 770

COMPUTE
75 sec**Easy**

Topic 5: Types of Sampling

P3-C13.2-U13.2-T05

Read first Study section 13.2.6: probability sampling (SRSWR/SRSWOR, stratified, multi-stage, cluster), non-probability (purposive/judgement) sampling and mixed (systematic) sampling, with merits, demerits and allocation rules in stratified sampling.

RECALL 30 sec know it or move on · 11 questions Remembering · Level I

- Three types: probability (SRS, stratified, multi-stage, multi-phase, cluster/area), non-probability (= purposive or judgement sampling, based entirely on the sampler's discretion; quota sampling is non-probability), and mixed (systematic sampling).
- SRS: every population unit has an equal chance of selection; it is completely free from sampler's bias. Systematic sampling selects every k-th unit after a random start (k = sampling interval).
- Stratified sampling allocation: Bowley/proportional allocation when strata variances are similar (n_i proportional to N_i); NEYMAN's allocation when strata variances differ significantly (n_i proportional to $N_i S_i$). Area sampling is similar to cluster sampling.
- Multi-stage sampling (state-district-police station-household) adds FLEXIBILITY to the sampling process, saves cost and labour, but is less accurate than stratified sampling.

PYQ 2024-Jun [66] · Pg 772

RECALL
30 sec**Easy**

PYQ 2024-Jun [67] · Pg 772

RECALL
30 sec**Easy**

MTP 2024-Dec S1 [68] · Pg 772

RECALL
30 sec**Easy**PYQ 2025-Jan [87] · Pg 773 **asked 2×****RECALL**
30 sec**Easy**

PYQ 2025-Sep [65] · Pg 776

RECALL
30 sec**Easy**

PYQ 2026-Jan [31] · Pg 778

RECALL
30 sec**Easy**

PYQ 2026-Jan [32] · Pg 778

RECALL
30 sec**Easy**

PYQ 2026-May [36] · Pg 780

RECALL
30 sec**Easy**

PYQ 2026-Sep [44] · Pg 781

RECALL
30 sec**Easy**

PYQ 2026-Sep [70] · Pg 781

RECALL**Easy**

	30 sec	
PYQ 2026-Jan [84] · Pg 778	RECALL 30 sec	Medium

RECOGNISE 45 sec decide which idea applies · 6 questions Understanding · Level I

- Match scenario to technique: proportional subgroup representation = stratified; internally homogeneous strata, maximum variation between strata = stratified; whole regions/blocks = cluster; 'most experienced doctors' or TV-audience likes = purposive/judgement.
- Destructive quality testing (chalks, bulbs) demands sampling, never complete enumeration; stratified gives per-stratum plus overall estimates.

PYQ 2024-Sep [100] · Pg 772	RECOGNISE 45 sec	Easy
PYQ 2024-Sep [87] · Pg 773 asked 2×	RECOGNISE 45 sec	Easy
PYQ 2025-Jan [90] · Pg 774	RECOGNISE 45 sec	Easy
PYQ 2025-Sep [66] · Pg 775	RECOGNISE 45 sec	Easy
PYQ 2026-Jan [27] · Pg 777	RECOGNISE 45 sec	Easy
PYQ 2026-May [85] · Pg 779	RECOGNISE 45 sec	Easy

COMPUTE 75 sec one formula, straight through — no question in this edition Application · Level II

- Systematic sampling drill: $N = 48$, $n = 6$ gives $k = N/n = 8$ — select a random start in 1-8, then every 8th employee code.
- Identify 'every 9th unit from the universal set' as systematic sampling; check $N = nk$ (linear) vs $N = nk + p$ (circular systematic sampling).

CHAPTER 14

Measures of Central Tendency and Dispersion

9 Topics · 269 Classified Questions · Importance: A

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 66 sec a question on average — **about the pace of the paper**

RECALL Remembering	13.9%	30 sec	30 of 216 past-exam questions
RECOGNISE Understanding	11.1%	45 sec	24 of 216 past-exam questions
COMPUTE Application	73.6%	75 sec	159 of 216 past-exam questions
SET UP Analysis	1.4%	150 sec	3 of 216 past-exam questions

Topic 1: Arithmetic Mean

P3-C14-U14-T01

Read first Study Unit 14.1 on Arithmetic Mean: computation for simple and grouped data (direct and assumed-mean methods), properties of AM, combined (pooled) mean and weighted AM.

RECALL 30 sec know it or move on · 8 questions Remembering · Level I

- AM = (sum of x)/ n or (sum of fx)/ N ; sum of deviations from the AM is ZERO; combined mean = $(n_1 \bar{x}_1 + n_2 \bar{x}_2)/(n_1 + n_2)$.
- AM is the best measure of central tendency; an average of overlapping averages = moving average; moderately skewed: Mean - Mode = 3(Mean - Median).
- Normal-curve points of inflexion sit at mean $\pm$ SD, so mean = their midpoint.

PYQ 2018-May [53] · Pg 787	RECALL 30 sec	Easy
PYQ 2018-Nov [62] · Pg 787	RECALL 30 sec	Easy
PYQ 2024-Sep [4] · Pg 799	RECALL 30 sec	Easy
PYQ 2025-Jan [94] · Pg 800	RECALL 30 sec	Easy
PYQ 2025-Jan [97] · Pg 801 asked 2×	RECALL 30 sec	Easy
MTP 2025-Jan S2 [70] · Pg 801 asked 2×	RECALL 30 sec	Easy
MTP 2025-Jan S2 [94] · Pg 801 asked 2×	RECALL 30 sec	Easy

PYQ 2026-May [39] · Pg 807

RECALL
30 sec**Easy****RECOGNISE 45 sec** decide which idea applies · 6 questions Understanding · Level I

- Change of origin/scale: $y = a + bx$ gives $\bar{y} = a + b\bar{x}$; adding k to every value adds k to the mean.
- $AM \geq GM \geq HM$, equal only when all values coincide ($AM = GM = 15$ forces $HM = 15$); $c = ab$ gives $GM(c) = GM(a) \times GM(b)$.

PYQ 2018-May [48] · Pg 786

RECOGNISE
45 sec**Easy**

PYQ 2018-May [51] · Pg 787

RECOGNISE
45 sec**Easy**

PYQ 2021-Jul [65] · Pg 790

RECOGNISE
45 sec**Easy**

PYQ 2021-Dec [69] · Pg 792

RECOGNISE
45 sec**Easy**

PYQ 2021-Dec [71] · Pg 792 asked 2×

RECOGNISE
45 sec**Easy**

PYQ 2023-Dec [72] · Pg 796

RECOGNISE
45 sec**Easy****COMPUTE 75 sec** one formula, straight through · 33 questions Application · Level II

- Missing value/frequency: set $(\sum fx)/N$ equal to the given mean and solve; replacement: new mean = old + $(\text{new} - \text{old})/n$.
- Partial means via totals: mean 14.4 for 10 items, first 4 average 16.5, remaining 6 average $(144 - 66)/6 = 13$; grouped mean uses class midpoints.
- Two numbers from AM and GM: $a + b = 2AM$, $ab = GM^2$; difference = $\sqrt{(2AM)^2 - 4GM^2}$.

PYQ 2018-Nov [60] · Pg 787

COMPUTE
75 sec**Easy**

PYQ 2022-Dec [72] · Pg 793

COMPUTE
75 sec**Easy**

PYQ 2023-Jun [65] · Pg 793

COMPUTE
75 sec**Easy**

PYQ 2023-Jun [68] · Pg 794

COMPUTE
75 sec**Easy**

PYQ 2023-Dec [70] · Pg 795

COMPUTE
75 sec**Easy**

PYQ 2023-Dec [71] · Pg 795 asked 2×

COMPUTE
75 sec**Easy**

MTP 2024-Jun S3 [76] · Pg 798

COMPUTE
75 sec**Easy**

MTP 2024-Jun S3 [93] · Pg 798

COMPUTE
75 sec**Easy**

PYQ 2025-Jan [86] · Pg 800	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [69] · Pg 801 asked 3×	COMPUTE 75 sec	Easy
PYQ 2025-Sep [70] · Pg 802	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [65] · Pg 806	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [66] · Pg 806	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [74] · Pg 806	COMPUTE 75 sec	Easy
RTP 2026-May [22] · Pg 806	COMPUTE 75 sec	Easy
PYQ 2026-May [42] · Pg 806	COMPUTE 75 sec	Easy
PYQ 2026-May [34] · Pg 808	COMPUTE 75 sec	Easy
PYQ 2026-Sep [95] · Pg 810	COMPUTE 75 sec	Easy
PYQ 2018-Nov [65] · Pg 788	COMPUTE 75 sec	Medium
PYQ 2018-Nov [70] · Pg 788	COMPUTE 75 sec	Medium
PYQ 2019-Jun [58] · Pg 789	COMPUTE 75 sec	Medium
PYQ 2021-Jul [72] · Pg 791	COMPUTE 75 sec	Medium
PYQ 2022-Jun [75] · Pg 792 asked 2×	COMPUTE 75 sec	Medium
PYQ 2023-Jun [67] · Pg 794	COMPUTE 75 sec	Medium
PYQ 2024-Jun [76] · Pg 796	COMPUTE 75 sec	Medium
PYQ 2024-Jun [79] · Pg 798	COMPUTE 75 sec	Medium
PYQ 2024-Sep [96] · Pg 799 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-Jan [82] · Pg 800 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-May [76] · Pg 802	COMPUTE 75 sec	Medium
PYQ 2026-Jan [89] · Pg 804	COMPUTE 75 sec	Medium
PYQ 2026-May [38] · Pg 808	COMPUTE 75 sec	Medium

PYQ 2026-May [88] · Pg 809	COMPUTE 75 sec	Medium
PYQ 2026-Jan [38] · Pg 805	COMPUTE 75 sec	Hard

SET UP 150 sec set it up before you compute · 2 questions · Analysis · Level II

- Convert wording to totals: 'subtract 50 from each of n numbers, sum becomes S' means original sum = S + 50n.
- Average-maintenance/subgroup problems: unknown = target mean x total count - known totals.

PYQ 2021-Jul [63] · Pg 789	SET UP 150 sec	Medium
PYQ 2025-Sep [77] · Pg 803	SET UP 150 sec	Medium

Topic 2: Geometric Mean

P3-C14-U14-T02

Read first Read the Geometric Mean portion of Unit 14.1: definition, log formula, uses for averaging rates/ratios, and the AM-GM-HM relations for two numbers.

COMPUTE 75 sec one formula, straight through · 5 questions · Application · Level II

- $GM = (x_1 x_2 \dots x_n)^{1/n}$ or antilog of $(\sum \log x)/n$; drill small products: GM of 3, 6, 24, 48 = 12; solve for an unknown from $GM^n = \text{product}$ ($40 \times 50 \times x = 10^3$).
- Use GM for average rates of return: GM of 100%, 200%, 400% i.e. of the growth ratios.
- For two numbers $GM^2 = AM \times HM$; with AM and GM given, numbers satisfy $a + b = 2AM$, $ab = GM^2$ — solve the quadratic.
- Empirical relation drills: if Median = 2 Mean then Mode = 3 Median - 2 Mean = 4 Mean; coefficient of QD = $(Q_3 - Q_1)/(Q_3 + Q_1) \times 100$.

PYQ 2018-Nov [61] · Pg 810	COMPUTE 75 sec	Easy
PYQ 2023-Jun [70] · Pg 811	COMPUTE 75 sec	Easy
PYQ 2026-Jan [37] · Pg 812	COMPUTE 75 sec	Easy
PYQ 2021-Dec [72] · Pg 811 asked 2x	COMPUTE 75 sec	Medium
PYQ 2025-May [71] · Pg 812	COMPUTE 75 sec	Medium

Topic 3: Harmonic Mean

P3-C14-U14-T03

Read first Study the Harmonic Mean section of Unit 14.1: definition as reciprocal of the AM of reciprocals, weighted and combined HM, and when HM is the appropriate average (rates and prices with equal numerators).

RECALL 30 sec know it or move on · 2 questions Remembering · Level I

- $HM = n / (\text{sum of } 1/x)$ — the reciprocal of the AM of the reciprocals of the observations.
- Combined HM of two groups = $(n_1 + n_2)/(n_1/H_1 + n_2/H_2)$; weighted HM = $(\text{sum of } w)/(\text{sum of } w/x)$.
- $AM \geq GM \geq HM$; for two numbers $GM^2 = AM \times HM$.

PYQ 2020-Nov [68] · Pg 815

RECALL
30 sec

Easy

PYQ 2021-Jan [63] · Pg 815

RECALL
30 sec

Easy

RECOGNISE 45 sec decide which idea applies · 1 question Understanding · Level I

- HM is the right average for rates when the NUMERATOR is constant: equal rupee amounts spent in different markets (average price = HM of prices) and equal distances at different speeds.
- Average speed over equal distances = $HM = 2ab/(a + b)$, NOT the AM of the speeds.

PYQ 2020-Nov [66] · Pg 814

RECOGNISE
45 sec

Easy

COMPUTE 75 sec one formula, straight through · 16 questions Application · Level II

- Speed drills: Delhi-Agra at 30 and back at 50 gives $2(30)(50)/80 = 37.5$ km/hr; HM of 2, 4, 6 = $3/(1/2 + 1/4 + 1/6) = 3.27$.
- Given AM and GM of two numbers, get $HM = GM^2/AM$; given HM of pairs, combine with the combined-HM formula.
- Combined-average problems (girls' mean 80, boys' 70, combined 76): use $n_1(x_1 - x) = n_2(x - x_2)$ to find the ratio or count.

PYQ 2023-Dec [67] · Pg 817 asked 2×

COMPUTE
75 sec

Easy

MTP 2024-Jun S3 [99] · Pg 818 asked 2×

COMPUTE
75 sec

Easy

PYQ 2025-Jan [100] · Pg 818 asked 2×

COMPUTE
75 sec

Easy

PYQ 2025-May [70] · Pg 818

COMPUTE
75 sec

Easy

PYQ 2025-Sep [75] · Pg 819	COMPUTE 75 sec	Easy
PYQ 2026-Jan [35] · Pg 820	COMPUTE 75 sec	Easy
PYQ 2026-Sep [20] · Pg 821	COMPUTE 75 sec	Easy
PYQ 2026-Sep [46] · Pg 822	COMPUTE 75 sec	Easy
PYQ 2020-Nov [64] · Pg 813	COMPUTE 75 sec	Medium
PYQ 2021-Dec [70] · Pg 816 asked 2×	COMPUTE 75 sec	Medium
PYQ 2022-Dec [76] · Pg 816	COMPUTE 75 sec	Medium
PYQ 2023-Jun [78] · Pg 817	COMPUTE 75 sec	Medium
PYQ 2025-Sep [72] · Pg 819	COMPUTE 75 sec	Medium
PYQ 2026-May [92] · Pg 820	COMPUTE 75 sec	Medium
PYQ 2026-May [91] · Pg 821	COMPUTE 75 sec	Medium
PYQ 2020-Nov [61] · Pg 813	COMPUTE 75 sec	Hard

Topic 4: Median, Quartile, Decile, Percentile

P3-C14-U14-T04

Read first Study the Median and Partition Values sections of Unit 14.1: median for raw and grouped data, quartiles, deciles and percentiles, and properties of positional averages.

RECALL 30 sec know it or move on · 7 questions Remembering · Level I

- Median = middle-most value, a POSITIONAL average; for even n take the AM of the two middle values; Median = $Q_2 = D_5 = P_{50}$.
- Median suits open-end classification and can be found graphically (ogives); grouped median = $l + ((N/2 - c)/f) \times h$.
- Quartiles split data into 4 parts, deciles 10, percentiles 100; QD, MD, SD are dispersion measures, not averages.

PYQ 2019-Jun [61] · Pg 823	RECALL 30 sec	Easy
PYQ 2020-Nov [62] · Pg 825	RECALL 30 sec	Easy

PYQ 2020-Nov [63] · Pg 825	RECALL 30 sec	Easy
MTP 2024-Jun S3 [87] · Pg 831	RECALL 30 sec	Easy
MTP 2024-Dec S1 [70] · Pg 832 asked 2×	RECALL 30 sec	Easy
PYQ 2025-Jan [95] · Pg 833 asked 2×	RECALL 30 sec	Easy
MTP 2025-Jan S2 [66] · Pg 833 asked 2×	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 4 questions Understanding · Level I

- Median is least affected by extreme values but lacks the mathematical properties AM has; it rests on the middle 50% position.
- $y = a + bx$ transforms the median: $\text{median}(y) = a + b \text{ median}(x)$.

PYQ 2019-Nov [59] · Pg 824 asked 2×	RECOGNISE 45 sec	Easy
PYQ 2020-Nov [65] · Pg 826	RECOGNISE 45 sec	Easy
PYQ 2021-Jan [61] · Pg 826	RECOGNISE 45 sec	Easy
PYQ 2025-May [77] · Pg 834 asked 2×	RECOGNISE 45 sec	Easy

COMPUTE 75 sec one formula, straight through · 24 questions Application · Level II

- Sort first; median rank = $(n + 1)/2$; Q_k at $k(n + 1)/4$, D_k at $k(n + 1)/10$, P_k at $k(n + 1)/100$ — interpolate between ranks.
- Grouped drills with the interpolation formula; Mode = 3 Median - 2 Mean fills the missing one of the trio.
- Two-number relations recur here: $GM = \sqrt{AM \times HM}$.

PYQ 2018-May [52] · Pg 822	COMPUTE 75 sec	Easy
PYQ 2018-Nov [59] · Pg 822	COMPUTE 75 sec	Easy
PYQ 2019-Nov [71] · Pg 825	COMPUTE 75 sec	Easy
PYQ 2020-Nov [67] · Pg 826	COMPUTE 75 sec	Easy
PYQ 2021-Dec [74] · Pg 826	COMPUTE 75 sec	Easy
PYQ 2021-Dec [77] · Pg 827	COMPUTE 75 sec	Easy

PYQ 2023-Jun [77] · Pg 829	COMPUTE 75 sec	Easy
PYQ 2023-Dec [75] · Pg 829	COMPUTE 75 sec	Easy
PYQ 2023-Dec [76] · Pg 829	COMPUTE 75 sec	Easy
PYQ 2024-Jun [70] · Pg 830 asked 2×	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [100] · Pg 831	COMPUTE 75 sec	Easy
MTP 2024-Aug S2 [68] · Pg 831	COMPUTE 75 sec	Easy
MTP 2024-Dec S1 [72] · Pg 833 asked 2×	COMPUTE 75 sec	Easy
MTP 2024-Dec S1 [78] · Pg 833	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [68] · Pg 834 asked 2×	COMPUTE 75 sec	Easy
PYQ 2026-Jan [36] · Pg 834	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [73] · Pg 835	COMPUTE 75 sec	Easy
PYQ 2019-Jun [65] · Pg 823	COMPUTE 75 sec	Medium
PYQ 2019-Nov [68] · Pg 824	COMPUTE 75 sec	Medium
PYQ 2022-Jun [76] · Pg 827	COMPUTE 75 sec	Medium
PYQ 2022-Dec [70] · Pg 828	COMPUTE 75 sec	Medium
PYQ 2023-Jun [73] · Pg 828	COMPUTE 75 sec	Medium
PYQ 2024-Jun [75] · Pg 830 asked 2×	COMPUTE 75 sec	Medium
PYQ 2024-Sep [97] · Pg 831	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 1 question Analysis · Level II

- Reconstruct the full ordered data set (e.g. 3 failed + 8 given marks) before locating the positional value.
- If a new observation changes the mean by a stated amount, recover the new total first, then re-order for the median.

MTP 2024-Dec S1 [66] · Pg 832	SET UP 150 sec	Medium
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Topic 5: Mode

P3-C14-U14-T05

Read first Study the Mode section of Unit 14.1: mode for raw and grouped data (modal-class formula), the empirical relation $\text{Mode} = 3 \text{ Median} - 2 \text{ Mean}$, and $\text{Mean} = \text{Median} = \text{Mode}$ for symmetric distributions.

RECALL 30 sec know it or move on · 4 questions · Remembering · Level I

- Mode = most frequent value; grouped mode = $l + ((f_1 - f_0)/(2f_1 - f_0 - f_2)) \times h$ in the highest-frequency class.
- Mode = $3 \text{ Median} - 2 \text{ Mean}$ (moderately skewed), i.e. $\text{Mean} - \text{Mode} = 3(\text{Mean} - \text{Median})$; symmetric: $\text{Mean} = \text{Median} = \text{Mode}$.
- Quartile deviation is dispersion, not central tendency; class mark = class midpoint.

PYQ 2018-May [49] · Pg 835 asked 2×	RECALL 30 sec	Easy
PYQ 2019-Jun [64] · Pg 836 asked 2×	RECALL 30 sec	Easy
PYQ 2019-Nov [66] · Pg 837	RECALL 30 sec	Easy
PYQ 2022-Jun [68] · Pg 839	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 3 questions · Understanding · Level I

- Mode answers 'most common size' questions (shoes, dress designs, most frequent opinion); it can be read from a histogram.
- $y = a + bx$ gives $\text{mode}(y) = a + b \text{ mode}(x)$; $GM = 0$ if any observation is 0; adding a constant leaves SD unchanged.

PYQ 2019-Nov [70] · Pg 837	RECOGNISE 45 sec	Easy
PYQ 2021-Jan [60] · Pg 837	RECOGNISE 45 sec	Easy
PYQ 2023-Jun [17] · Pg 839	RECOGNISE 45 sec	Easy

COMPUTE 75 sec one formula, straight through · 21 questions · Application · Level II

- Given two of mean/median/mode, compute the third: mean 3.57, mode 2.13 gives median = $(2 \times 3.57 + 2.13)/3 = 3.09$; $\text{Mean} - \text{Median} = (\text{Mean} - \text{Mode})/3$.
- Raw-data mode by counting repeats; grouped modal formula; $\text{mode}(y) = a + b \text{ mode}(x)$ drills.
- CV crossovers: variance = $(CV \times AM/100)^2 \times AM$ 10, CV 40 gives 16.

PYQ 2018-Nov [68] · Pg 835	COMPUTE 75 sec	Easy
PYQ 2019-Jun [59] · Pg 836	COMPUTE 75 sec	Easy
PYQ 2021-Jan [62] · Pg 837	COMPUTE 75 sec	Easy
PYQ 2021-Jul [66] · Pg 838	COMPUTE 75 sec	Easy
PYQ 2021-Dec [73] · Pg 838 asked 2×	COMPUTE 75 sec	Easy
PYQ 2022-Dec [63] · Pg 839	COMPUTE 75 sec	Easy
PYQ 2023-Jun [18] · Pg 840	COMPUTE 75 sec	Easy
PYQ 2023-Dec [69] · Pg 840	COMPUTE 75 sec	Easy
MTP 2024-Aug S2 [74] · Pg 842	COMPUTE 75 sec	Easy
PYQ 2024-Sep [3] · Pg 842	COMPUTE 75 sec	Easy
PYQ 2025-Jan [96] · Pg 842 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-May [78] · Pg 843	COMPUTE 75 sec	Easy
PYQ 2025-May [79] · Pg 843	COMPUTE 75 sec	Easy
PYQ 2025-Sep [71] · Pg 844	COMPUTE 75 sec	Easy
PYQ 2026-Jan [87] · Pg 845	COMPUTE 75 sec	Easy
PYQ 2026-Sep [22] · Pg 845	COMPUTE 75 sec	Easy
PYQ 2026-Sep [97] · Pg 845	COMPUTE 75 sec	Easy
PYQ 2019-Nov [62] · Pg 836	COMPUTE 75 sec	Medium
PYQ 2024-Jun [68] · Pg 840	COMPUTE 75 sec	Medium
PYQ 2024-Jun [73] · Pg 841	COMPUTE 75 sec	Medium
PYQ 2026-Jan [88] · Pg 844	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 1 question Analysis · Level II

- Tabulate value-frequency pairs from the scenario (buildings vs residents, survey opinions) before reading off the mode.
- Then compare mode with mean/median as the question directs — compute each from the same table.

PYQ 2021-Dec [76] · Pg 839

SET UP
150 sec**Medium**

Topic 6: Range

P3-C14-U14-T06

Read first Study the Range portion of Unit 14.2 (Dispersion): definition, coefficient of range, and the effect of change of origin and scale on range.

RECALL 30 sec know it or move on · 1 question Remembering · Level I

- Range = $L - S$ (largest minus smallest value); it is the simplest measure, based only on the two extremes.
- Coefficient of range = $(L - S)/(L + S) \times 100$.

PYQ 2024-Sep [94] · Pg 852

RECALL
30 sec**Easy****RECOGNISE 45 sec** decide which idea applies · 2 questions Understanding · Level I

- Range depends only on extremes, so the MEDIAN is unaffected if the lowest and highest observations are changed (as long as order positions hold).
- Range is unaffected by change of origin but affected by change of scale.

PYQ 2024-Jun [69] · Pg 851

RECOGNISE
45 sec**Easy**

PYQ 2021-Dec [75] · Pg 848

RECOGNISE
45 sec**Medium****COMPUTE 75 sec** one formula, straight through · 14 questions Application · Level II

- Coefficient-of-range drills: for 20,...,60 coefficient = $(60 - 20)/(60 + 20) \times 100 = 50$; find minimum from range and maximum ($83 - 65 = 18$).
- Linear relation $y = a + bx$ gives $\text{Range}(y) = |b| \cdot \text{Range}(x)$: $2x + 3y = 10$ with $\text{range}(y) = 10$ gives $\text{range}(x) = 15$; range of $-3x + 50$ with $\text{range}(x) = 2$ is 6.
- Corrected-mean drills: corrected sum = wrong sum - wrong values + correct values, then divide by n ;
profit/loss series: range uses the algebraic smallest (most negative) value.

PYQ 2018-Nov [64] · Pg 846

COMPUTE
75 sec**Easy**

PYQ 2019-Nov [69] · Pg 846

COMPUTE
75 sec**Easy**

PYQ 2021-Jan [65] · Pg 847

COMPUTE
75 sec**Easy**

PYQ 2021-Jul [70] · Pg 847	COMPUTE 75 sec	Easy
PYQ 2023-Dec [74] · Pg 850	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [74] · Pg 851	COMPUTE 75 sec	Easy
PYQ 2024-Sep [5] · Pg 851	COMPUTE 75 sec	Easy
PYQ 2025-Sep [74] · Pg 852	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [71] · Pg 853 asked 2x	COMPUTE 75 sec	Easy
PYQ 2026-Jan [85] · Pg 853	COMPUTE 75 sec	Easy
PYQ 2026-Sep [67] · Pg 853	COMPUTE 75 sec	Easy
PYQ 2022-Jun [73] · Pg 849	COMPUTE 75 sec	Medium
PYQ 2022-Jun [74] · Pg 849	COMPUTE 75 sec	Medium
PYQ 2025-May [74] · Pg 852	COMPUTE 75 sec	Medium

Topic 7: Mean Deviation

P3-C14-U14-T07

Read first Study the Mean Deviation section of Unit 14.2: MD about mean/median/mode, its minimum property about the median, coefficient of MD, and change of origin and scale.

RECALL 30 sec know it or move on · 2 questions Remembering · Level I

- MD about A = $(1/n) \times \text{sum of } |x - A|$; MD is MINIMUM about the MEDIAN; coefficient of MD = $(\text{MD}/\text{average used}) \times 100$.
- MD is a dispersion measure (not central tendency) based on absolute deviations; for a normal curve MD = 0.8 SD and QD = 0.675 SD.

PYQ 2018-Nov [63] · Pg 853	RECALL 30 sec	Easy
PYQ 2022-Jun [72] · Pg 857	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 2 questions Understanding · Level I

- Sum of signed deviations from the AM is zero — hence absolute values in MD.
- MD is unaffected by origin shift; $y = a + bx$ gives $\text{MD}(y) = |b| \text{MD}(x)$; use weighted average when items differ in importance.

PYQ 2021-Jul [69] · Pg 855	RECOGNISE 45 sec	Easy
PYQ 2021-Dec [68] · Pg 856 asked 2×	RECOGNISE 45 sec	Easy

COMPUTE 75 sec one formula, straight through · 12 questions Application · Level II

- Compute the average, then mean of absolute deviations: MD of 2,4,7,8,9,12 about mean 7 = $16/6 = 2.67$.
- Linear relation drills ($4x + 2y + 12 = 0$ gives $MD(y) = 2 MD(x)$); normal conversions MD = 0.8 sigma, QD = 0.675 sigma.
- Empirical-relation fill-ins recur here: mode = 3 median - 2 mean.

PYQ 2022-Dec [68] · Pg 857	COMPUTE 75 sec	Easy
PYQ 2023-Jun [72] · Pg 859	COMPUTE 75 sec	Easy
PYQ 2024-Jun [72] · Pg 859	COMPUTE 75 sec	Easy
PYQ 2025-Jan [91] · Pg 859	COMPUTE 75 sec	Easy
PYQ 2026-Jan [86] · Pg 860	COMPUTE 75 sec	Easy
PYQ 2026-May [89] · Pg 860	COMPUTE 75 sec	Easy
PYQ 2026-Sep [19] · Pg 861	COMPUTE 75 sec	Easy
PYQ 2021-Jan [68] · Pg 853	COMPUTE 75 sec	Medium
PYQ 2021-Jul [64] · Pg 854	COMPUTE 75 sec	Medium
PYQ 2021-Jul [71] · Pg 856	COMPUTE 75 sec	Medium
PYQ 2022-Jun [70] · Pg 857	COMPUTE 75 sec	Medium
PYQ 2023-Jun [66] · Pg 858 asked 2×	COMPUTE 75 sec	Hard

SET UP 150 sec set it up before you compute · 1 question Analysis · Level II

- Normal quartile problems: mode = mean = $(Q1 + Q3)/2$ and sigma = $(Q3 - Q1)/(2 \times 0.675)$ — set identities up before computing.
- Adding a constant to all observations shifts mean/median but leaves MD, SD, QD unchanged.

MTP 2025-Jan S2 [90] · Pg 860 asked 2×	SET UP 150 sec	Hard
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Topic 8: Standard Deviation

P3-C14-U14-T08

Read first Study the Standard Deviation section of Unit 14.2: SD and variance formulas, combined SD, coefficient of variation, SD of first n natural numbers and of two numbers, and change of origin/scale.

RECALL 30 sec know it or move on · 10 questions Remembering · Level I

- SD = $\sqrt{\sum x^2/n - \text{mean}^2}$; variance = SD^2 ; CV = $(\text{SD}/\text{AM}) \times 100$ compares consistency of two series.
- SD is independent of ORIGIN, not scale; SD = 0 only when all observations are equal.
- SD of first n naturals = $\sqrt{(n^2 - 1)/12}$; SD of two numbers = $\sqrt{|a - b|/2}$; combined SD = $\sqrt{(n_1(s_1^2 + d_1^2) + n_2(s_2^2 + d_2^2))/(n_1 + n_2)}$.

PYQ 2019-Nov [58] · Pg 865 asked 2×	RECALL 30 sec	Easy
PYQ 2019-Nov [60] · Pg 865	RECALL 30 sec	Easy
PYQ 2021-Jan [64] · Pg 868	RECALL 30 sec	Easy
PYQ 2022-Jun [71] · Pg 870	RECALL 30 sec	Easy
PYQ 2022-Dec [22] · Pg 871 asked 2×	RECALL 30 sec	Easy
PYQ 2024-Jun [74] · Pg 876	RECALL 30 sec	Easy
MTP 2024-Jun S3 [77] · Pg 877	RECALL 30 sec	Easy
MTP 2024-Aug S2 [61] · Pg 877	RECALL 30 sec	Easy
RTP 2025-Jan [21] · Pg 880	RECALL 30 sec	Easy
PYQ 2026-May [35] · Pg 884	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 8 questions Understanding · Level I

- Adding a constant changes only the mean (SD/MD/QD unchanged); multiplying by b scales SD by $|b|$ and variance by b^2 .
- CV shifts when the origin shifts (subtracting 5 from each value raises CV since mean falls, SD unchanged).

PYQ 2019-Jun [63] · Pg 864	RECOGNISE 45 sec	Easy
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PYQ 2019-Nov [63] · Pg 866	RECOGNISE 45 sec	Easy
PYQ 2022-Jun [77] · Pg 870	RECOGNISE 45 sec	Easy
PYQ 2022-Dec [64] · Pg 871	RECOGNISE 45 sec	Easy
PYQ 2022-Dec [74] · Pg 872	RECOGNISE 45 sec	Easy
MTP 2024-Aug S2 [67] · Pg 877 asked 2×	RECOGNISE 45 sec	Easy
MTP 2024-Dec S1 [73] · Pg 879	RECOGNISE 45 sec	Easy
MTP 2024-Dec S1 [67] · Pg 879	RECOGNISE 45 sec	Medium

COMPUTE 75 sec one formula, straight through · 45 questions Application · Level II

- $y = a + bx$ drills: $SD(y) = |b| SD(x)$; $Var(2x + 5) = 4 Var(x)$.
- CV triangle: any two of CV, sigma, mean give the third (CV 20, sigma 10 gives mean 50).
- From sums: $n = 10$, $\sum x = 20$, $\sum x^2 = 80$ gives $SD = \sqrt{8 - 4} = 2$; $\sqrt{((n^2 - 1)/12)} = 2$ gives $n = 7$.

PYQ 2018-Nov [69] · Pg 863	COMPUTE 75 sec	Easy
PYQ 2019-Jun [57] · Pg 863	COMPUTE 75 sec	Easy
PYQ 2019-Jun [62] · Pg 864	COMPUTE 75 sec	Easy
PYQ 2019-Jun [67] · Pg 865	COMPUTE 75 sec	Easy
PYQ 2019-Nov [64] · Pg 867	COMPUTE 75 sec	Easy
PYQ 2021-Jan [66] · Pg 868	COMPUTE 75 sec	Easy
PYQ 2021-Jul [67] · Pg 868 asked 2×	COMPUTE 75 sec	Easy
PYQ 2022-Dec [62] · Pg 870	COMPUTE 75 sec	Easy
PYQ 2022-Dec [73] · Pg 872	COMPUTE 75 sec	Easy
PYQ 2022-Dec [75] · Pg 873	COMPUTE 75 sec	Easy
PYQ 2022-Dec [77] · Pg 873	COMPUTE 75 sec	Easy
PYQ 2023-Jun [76] · Pg 875	COMPUTE 75 sec	Easy
PYQ 2024-Jun [71] · Pg 875	COMPUTE 75 sec	Easy

MTP 2024-Jun S3 [95] · Pg 877	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [94] · Pg 877	COMPUTE 75 sec	Easy
MTP 2024-Aug S2 [71] · Pg 878	COMPUTE 75 sec	Easy
MTP 2024-Aug S2 [86] · Pg 878 asked 2×	COMPUTE 75 sec	Easy
PYQ 2024-Sep [2] · Pg 878	COMPUTE 75 sec	Easy
MTP 2024-Dec S1 [71] · Pg 879	COMPUTE 75 sec	Easy
PYQ 2025-Jan [2] · Pg 880	COMPUTE 75 sec	Easy
PYQ 2025-Jan [92] · Pg 880 asked 2×	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [72] · Pg 881 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-May [73] · Pg 881	COMPUTE 75 sec	Easy
PYQ 2025-Sep [78] · Pg 881	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [67] · Pg 883	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [68] · Pg 883	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [69] · Pg 883	COMPUTE 75 sec	Easy
PYQ 2026-Sep [21] · Pg 884	COMPUTE 75 sec	Easy
PYQ 2026-Sep [69] · Pg 884	COMPUTE 75 sec	Easy
PYQ 2026-Sep [96] · Pg 884	COMPUTE 75 sec	Easy
PYQ 2018-May [54] · Pg 861	COMPUTE 75 sec	Medium
PYQ 2018-Nov [66] · Pg 862	COMPUTE 75 sec	Medium
PYQ 2018-Nov [67] · Pg 863	COMPUTE 75 sec	Medium
PYQ 2019-Nov [61] · Pg 866	COMPUTE 75 sec	Medium
PYQ 2019-Nov [67] · Pg 867	COMPUTE 75 sec	Medium
PYQ 2021-Jul [68] · Pg 869	COMPUTE 75 sec	Medium

PYQ 2022-Dec [71] · Pg 871	COMPUTE 75 sec	Medium
PYQ 2024-Jun [77] · Pg 876	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [72] · Pg 876 asked 2×	COMPUTE 75 sec	Medium
PYQ 2024-Sep [7] · Pg 878	COMPUTE 75 sec	Medium
RTP 2025-Jan [28] · Pg 881	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [75] · Pg 881 asked 5×	COMPUTE 75 sec	Medium
PYQ 2025-Sep [76] · Pg 882	COMPUTE 75 sec	Medium
PYQ 2026-Jan [14] · Pg 882	COMPUTE 75 sec	Medium
PYQ 2023-Jun [75] · Pg 873	COMPUTE 75 sec	Hard

SET UP 150 sec set it up before you compute · 1 question · Analysis · Level II

- Two-group SD: pool each group's $n(s^2 + d^2)$ with $d = \text{group mean} - \text{combined mean}$, then take the root; for added/excluded values rebuild sum x and sum x^2 first.
- Judge CV direction qualitatively: pure scale change leaves CV unchanged; origin change alters it.

MTP 2024-Dec S1 [76] · Pg 880	SET UP 150 sec	Hard
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Topic 9: Quartile Deviation

P3-C14-U14-T09

Read first Study the Quartile Deviation section of Unit 14.2: semi-interquartile range, coefficient of QD, suitability for open-end distributions, and relative vs absolute measures of dispersion.

RECALL 30 sec know it or move on · 6 questions · Remembering · Level I

- $QD = (Q3 - Q1)/2$ (semi-interquartile range); coefficient of $QD = (Q3 - Q1)/(Q3 + Q1) \times 100$ — a RELATIVE measure of dispersion.
- QD is the appropriate (absolute) measure for OPEN-END classification and is not affected by extreme observations (it ignores the first and last 25% of values).
- For a moderately skewed/normal distribution $QD = (2/3) SD$ ($QD = 0.675 \sigma$); SD is based on all observations while QD uses the central fifty percent.

PYQ 2021-Jan [67] · Pg 887	RECALL 30 sec	Easy
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MTP 2024-Aug S2 [70] · Pg 892	RECALL 30 sec	Easy
PYQ 2024-Sep [1] · Pg 892	RECALL 30 sec	Easy
MTP 2025-Jan S2 [65] · Pg 894 asked 4×	RECALL 30 sec	Easy
PYQ 2025-May [75] · Pg 894	RECALL 30 sec	Easy
PYQ 2025-May [72] · Pg 895 asked 2×	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 1 question Understanding · Level I

- Absolute measures (range, QD, MD, SD) carry units; relative measures (their coefficients, CV) are unit-free and used for comparison.
- QD is unaffected by change of origin; under $y = a + bx$, $QD(y) = |b| QD(x)$.

PYQ 2025-Sep [73] · Pg 895	RECOGNISE 45 sec	Easy
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COMPUTE 75 sec one formula, straight through · 26 questions Application · Level II

- From quartiles: $Q_1 = 45$, $Q_3 = 65$ gives $QD = 10$; for raw data take Q_1 and Q_3 at ranks $(n + 1)/4$ and $3(n + 1)/4$ first.
- Coefficient tricks: coefficient of $QD = 1/4$ means $(Q_3 - Q_1)/(Q_3 + Q_1) = 1/4$, so $Q_3/Q_1 = 5/3$.
- Linear relation: $4x + 2y = 3$ with $QD(y) = 3$ gives $QD(x) = 1.5$; $3x + 4y = 20$ with $QD(x) = 16$ gives $QD(y) = 12$.
- Normal-curve drill: $QD = 0.675 \times SD$ ($SD 4$ gives $QD = 2.7$); symmetric series: Median = $Q_1 + QD$ ($142 + 18 = 160$).

PYQ 2018-May [50] · Pg 885	COMPUTE 75 sec	Easy
PYQ 2022-Dec [65] · Pg 888	COMPUTE 75 sec	Easy
PYQ 2022-Dec [69] · Pg 888	COMPUTE 75 sec	Easy
PYQ 2023-Dec [66] · Pg 889	COMPUTE 75 sec	Easy
PYQ 2023-Dec [68] · Pg 890	COMPUTE 75 sec	Easy
PYQ 2024-Jun [78] · Pg 891	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [73] · Pg 891 asked 2×	COMPUTE 75 sec	Easy
RTP 2024-Sep [21] · Pg 893 asked 3×	COMPUTE 75 sec	Easy

PYQ 2025-Jan [3] · Pg 894	COMPUTE 75 sec	Easy
RTP 2025-Jan [29] · Pg 894	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [73] · Pg 894 asked 2×	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [74] · Pg 894 asked 2×	COMPUTE 75 sec	Easy
PYQ 2026-Jan [34] · Pg 897	COMPUTE 75 sec	Easy
MTP 2026-Apr S2 [66] · Pg 897	COMPUTE 75 sec	Easy
PYQ 2026-May [90] · Pg 897	COMPUTE 75 sec	Easy
PYQ 2026-Sep [94] · Pg 898	COMPUTE 75 sec	Easy
PYQ 2019-Jun [60] · Pg 885	COMPUTE 75 sec	Medium
PYQ 2019-Jun [66] · Pg 886	COMPUTE 75 sec	Medium
PYQ 2019-Nov [65] · Pg 886	COMPUTE 75 sec	Medium
PYQ 2022-Jun [69] · Pg 887	COMPUTE 75 sec	Medium
PYQ 2023-Jun [71] · Pg 889	COMPUTE 75 sec	Medium
PYQ 2023-Dec [73] · Pg 890	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [75] · Pg 892 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [69] · Pg 892	COMPUTE 75 sec	Medium
PYQ 2024-Sep [8] · Pg 892	COMPUTE 75 sec	Medium
PYQ 2025-Sep [79] · Pg 896	COMPUTE 75 sec	Medium

CHAPTER 15

Probability

10 Topics · 157 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 72 sec a question on average — **about the pace of the paper**

RECALL Remembering	8.3%	30 sec	10 of 120 past-exam questions
RECOGNISE Understanding	5.0%	45 sec	6 of 120 past-exam questions
COMPUTE Application	83.3%	75 sec	100 of 120 past-exam questions
SET UP Analysis	3.3%	150 sec	4 of 120 past-exam questions

Topic 1: Introduction

P3-C15-U15-T01

Read first Read the opening section of the Probability chapter on why probability is needed in decision-making and its two broad divisions, along with the roadmap of the definitions covered later.

RECALL 30 sec know it or move on · 1 question Remembering · Level I

- Two broad divisions of probability: subjective probability and objective probability; subjective probability is used in decision-making under uncertainty.
- Probability is always a number between 0 and 1: 0 for an impossible event, 1 for a sure/certain event.

PYQ 2018-May [56] · Pg 902

RECALL
30 sec

Easy

RECOGNISE 45 sec decide which idea applies · 1 question Understanding · Level I

- Expectation preserves order: if $Y \leq X$ for all outcomes, then $E(Y) \leq E(X)$; comparing $E(X)$ and $E(Y)$ follows the same inequality as the variables.
- Objective probability rests on repeatable random experiments; subjective probability is a personal degree of belief, not derived from trials.

PYQ 2019-Jun [68] · Pg 903

RECOGNISE
45 sec

Easy

Topic 2: Random Experiment

P3-C15-U15-T02

Read first Study 'Random Experiment' and 'Events': definitions of random experiment, equally

likely, mutually exclusive and exhaustive events, simple vs composite events, and odds in favour/against.

RECALL 30 sec know it or move on · 3 questions · Remembering · Level I

- Odds in favour $P : Q$ means probability = $P/(P + Q)$; odds against means $Q/(P + Q)$.
- $P(A - B) = P(A) - P(A \text{ intersection } B)$ for any two events.
- Mutually exclusive events cannot occur together; exhaustive events cover all outcomes.

PYQ 2019-Jun [69] · Pg 905	RECALL 30 sec	Easy
PYQ 2022-Jun [84] · Pg 905 asked 2×	RECALL 30 sec	Easy
PYQ 2024-Sep [6] · Pg 908	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 4 questions · Understanding · Level I

- To spot mutually exclusive pairs, ask whether both statements can hold for the same person/trial at once.
- If A, B are independent with positive probabilities, A' and B' are also independent, and A, B cannot be mutually exclusive.
- Independence test: $P(A \text{ intersection } B) = P(A)P(B)$; exclusivity needs $P(A \text{ intersection } B) = 0$ - different conditions.

PYQ 2021-Dec [79] · Pg 905	RECOGNISE 45 sec	Easy
PYQ 2024-Sep [9] · Pg 908	RECOGNISE 45 sec	Easy
PYQ 2022-Dec [81] · Pg 906	RECOGNISE 45 sec	Medium
PYQ 2023-Jun [83] · Pg 906	RECOGNISE 45 sec	Medium

COMPUTE 75 sec one formula, straight through · 17 questions · Application · Level II

- Single draw: favourable/total, e.g. red from $6W + 5R = 5/11$.
- 'At least one' in n trials: $1 - (1 - p)^n$, e.g. at least one six in 3 throws = $1 - (5/6)^3$; smallest n with $1 - (1/2)^n = 0.875$ is 3.
- Leap year: $P(53 \text{ of a weekday}) = 2/7$; non-leap year $1/7$.
- Marksmen: multiply independent probabilities for 'both hit'; use complements for 'at least one'.

PYQ 2018-Nov [72] · Pg 903	COMPUTE	Easy
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	75 sec	
PYQ 2018-Nov [75] · Pg 904	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [67] · Pg 907	COMPUTE 75 sec	Easy
MTP 2024-Dec S1 [74] · Pg 908	COMPUTE 75 sec	Easy
MTP 2024-Dec S1 [77] · Pg 909	COMPUTE 75 sec	Easy
MTP 2024-Dec S1 [80] · Pg 909 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-Sep [81] · Pg 911	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [82] · Pg 911 asked 2×	COMPUTE 75 sec	Easy
MTP 2026-Apr S2 [90] · Pg 912	COMPUTE 75 sec	Easy
PYQ 2018-Nov [74] · Pg 904	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [75] · Pg 907	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [82] · Pg 909 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-May [89] · Pg 910	COMPUTE 75 sec	Medium
PYQ 2025-Sep [80] · Pg 910	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [85] · Pg 911 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [76] · Pg 907	COMPUTE 75 sec	Hard
MTP 2024-Dec S1 [84] · Pg 909	COMPUTE 75 sec	Hard

SET UP 150 sec break down and compare · 2 questions Analysis · Level II

MTP 2024-Aug S2 [78] · Pg 907 asked 2×	SET UP 150 sec	Medium
MTP 2024-Dec S1 [83] · Pg 909	SET UP 150 sec	Medium

Topic 3: Classical Definition of Probability

P3-C15-U15-T03

Read first Study the classical (a priori) definition $P(A) = \text{favourable outcomes} / \text{total equally likely outcomes}$, its assumptions and limitations, and the worked coin, dice, card and ball-drawing examples.

RECALL 30 sec know it or move on · 1 question Remembering · Level I

- Classical definition: $P(A) = m/n$ where the n outcomes are equally likely, mutually exclusive and exhaustive; $0 \leq P(A) \leq 1$.
- 'Chance' and 'probability' are synonyms; odds in favour of $A = m : (n - m)$.
- Limitations: definition fails when outcomes are not equally likely or are infinite in number.

PYQ 2018-May [57] · Pg 912

RECALL
30 sec

Easy

COMPUTE 75 sec one formula, straight through · 48 questions Application · Level II

- Two dice: 36 outcomes; count favourable cases, e.g. sum 9 gives $4/36$, sum a multiple of 3 gives $12/36$, at least one 5 gives $11/36$.
- n coins/tosses: 2^n outcomes; heads and tails alternating in n tosses = $2/2^n$; at least one tail with 2 coins = $3/4$.
- Drawing without order: use combinations, e.g. 2 non-vowels from HOME = $2C2/4C2 = 1/6$; 'not a given type' = $1 - P(\text{that type})$.
- Three identical dice showing the same number: $6/216 = 1/36$.

PYQ 2019-Jun [72] · Pg 913

COMPUTE
75 sec

Easy

PYQ 2019-Nov [72] · Pg 913

COMPUTE
75 sec

Easy

PYQ 2019-Nov [75] · Pg 914

COMPUTE
75 sec

Easy

PYQ 2020-Nov [69] · Pg 914

COMPUTE
75 sec

Easy

PYQ 2020-Nov [70] · Pg 914

COMPUTE
75 sec

Easy

PYQ 2021-Jan [71] · Pg 915

COMPUTE
75 sec

Easy

PYQ 2021-Jan [72] · Pg 916

COMPUTE
75 sec

Easy

PYQ 2021-Jan [73] · Pg 916

COMPUTE
75 sec

Easy

PYQ 2021-Jan [74] · Pg 917

COMPUTE
75 sec

Easy

PYQ 2021-Jul [73] · Pg 917

COMPUTE
75 sec

Easy

PYQ 2021-Jul [75] · Pg 918

COMPUTE
75 sec

Easy

PYQ 2021-Jul [78] · Pg 919

COMPUTE
75 sec

Easy

PYQ 2021-Dec [82] · Pg 919	COMPUTE 75 sec	Easy
PYQ 2022-Jun [79] · Pg 921 asked 2×	COMPUTE 75 sec	Easy
PYQ 2022-Jun [81] · Pg 922	COMPUTE 75 sec	Easy
PYQ 2022-Dec [80] · Pg 923	COMPUTE 75 sec	Easy
PYQ 2022-Dec [83] · Pg 924	COMPUTE 75 sec	Easy
PYQ 2022-Dec [84] · Pg 924	COMPUTE 75 sec	Easy
PYQ 2023-Jun [82] · Pg 926	COMPUTE 75 sec	Easy
MTP 2024-Aug S2 [87] · Pg 929	COMPUTE 75 sec	Easy
PYQ 2024-Sep [12] · Pg 929	COMPUTE 75 sec	Easy
PYQ 2024-Sep [13] · Pg 929	COMPUTE 75 sec	Easy
PYQ 2025-Jan [13] · Pg 930 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-May [86] · Pg 931	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [81] · Pg 936	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [90] · Pg 937	COMPUTE 75 sec	Easy
PYQ 2026-May [40] · Pg 937	COMPUTE 75 sec	Easy
PYQ 2026-Sep [23] · Pg 938	COMPUTE 75 sec	Easy
PYQ 2026-Sep [68] · Pg 938	COMPUTE 75 sec	Easy
PYQ 2018-Nov [73] · Pg 912	COMPUTE 75 sec	Medium
PYQ 2021-Jul [77] · Pg 918	COMPUTE 75 sec	Medium
PYQ 2021-Dec [83] · Pg 920	COMPUTE 75 sec	Medium
PYQ 2022-Jun [78] · Pg 920	COMPUTE 75 sec	Medium
PYQ 2022-Jun [82] · Pg 922	COMPUTE 75 sec	Medium
PYQ 2022-Dec [78] · Pg 923 asked 2×	COMPUTE 75 sec	Medium

PYQ 2023-Jun [84] · Pg 925	COMPUTE 75 sec	Medium
PYQ 2023-Jun [81] · Pg 925	COMPUTE 75 sec	Medium
PYQ 2024-Jun [84] · Pg 928	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [83] · Pg 930 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-May [80] · Pg 930	COMPUTE 75 sec	Medium
PYQ 2025-May [83] · Pg 932	COMPUTE 75 sec	Medium
PYQ 2025-May [84] · Pg 932	COMPUTE 75 sec	Medium
PYQ 2025-Sep [83] · Pg 933	COMPUTE 75 sec	Medium
PYQ 2025-Sep [84] · Pg 934	COMPUTE 75 sec	Medium
PYQ 2025-Sep [85] · Pg 934	COMPUTE 75 sec	Medium
PYQ 2025-Sep [82] · Pg 935	COMPUTE 75 sec	Medium
PYQ 2026-Jan [92] · Pg 936	COMPUTE 75 sec	Medium
PYQ 2026-May [96] · Pg 937	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute · 3 questions · Analysis · Level II

- Multi-dice conditions (e.g. third die greater than the sum of the other two): fix the sum of two dice, count cases for each value, then divide by 216.
- Group/classification problems (males/females, service holders): build a two-way table first, then read off the favourable count over the total.

PYQ 2024-Jun [82] · Pg 927	SET UP 150 sec	Medium
PYQ 2020-Nov [71] · Pg 915	SET UP 150 sec	Hard
MTP 2024-Aug S2 [83] · Pg 928	SET UP 150 sec	Hard

Topic 4: Statistical Definition of Probability

P3-C15-U15-T04

Read first Read the statistical (relative frequency) definition: $P(A) = \text{limit of } F_A/n \text{ as } n \text{ becomes large}$, used when outcomes are not equally likely; contrast it with the classical definition.

COMPUTE 75 sec one formula, straight through · 2 questions Application · Level II

- Selection problems: $P(\text{exactly 2 children among 4 chosen from 3 men, 2 women, 4 children}) = (4C2 \times 5C2)/9C4$ - split favourable choices by group and divide by total combinations.
- Production-mix defect rate: overall probability of a defective = sum over types of (share of production $\times$ that type's defect rate), i.e. a relative-frequency weighted average.

PYQ 2024-Jun [86] · Pg 939

COMPUTE
75 sec**Easy**

PYQ 2023-Jun [79] · Pg 939

COMPUTE
75 sec**Medium**

Topic 5: Operations on Events: Set Theoretic Approach to Probability

P3-C15-U15-T05

Read first Study the set-theoretic approach: sample space and sample points, union, intersection, complement and difference of events, De Morgan's laws, and the resulting probability formulas.

RECALL 30 sec know it or move on · 3 questions Remembering · Level I

- $P(A - B) = P(A) - P(A \text{ intersection } B)$ and $P(B - A) = P(B) - P(A \text{ intersection } B)$.
- $P(A') = 1 - P(A)$; De Morgan: $(A \text{ union } B)' = A' \text{ intersection } B'$, $(A \text{ intersection } B)' = A' \text{ union } B'$.
- A simple event cannot be decomposed further; an event that can be subdivided into further events is a composite event.

PYQ 2021-Jan [69] · Pg 942

RECALL
30 sec**Easy**

MTP 2024-Jun S3 [64] · Pg 944

RECALL
30 sec**Easy**

MTP 2024-Aug S2 [79] · Pg 945

RECALL
30 sec**Easy****COMPUTE 75 sec** one formula, straight through · 14 questions Application · Level II

- $P(A') + P(B') = 2 - [P(A \text{ union } B) + P(A \text{ intersection } B)]$, e.g. $2 - (0.8 + 0.3) = 0.9$.
- 'Exactly one' / contradiction: $P(A)(1 - P(B)) + P(B)(1 - P(A))$, e.g. $0.75(0.4) + 0.6(0.25) = 45\%$.
- Solve $P(A \text{ union } B) = P(A) + P(B) - P(A \text{ intersection } B)$ for any missing term; mutually exclusive drops the intersection.
- Money problems: sum of payoff $\times$ probability, e.g. $0.4(\text{₹}400) + 0.6(-\text{₹}100) = \text{₹}100$.

PYQ 2018-Nov [71] · Pg 940

COMPUTE
75 sec**Easy**

PYQ 2021-Dec [80] · Pg 943 asked 2×	COMPUTE 75 sec	Easy
PYQ 2023-Dec [77] · Pg 943	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [66] · Pg 944	COMPUTE 75 sec	Easy
MTP 2024-Aug S2 [77] · Pg 945	COMPUTE 75 sec	Easy
PYQ 2024-Sep [11] · Pg 945	COMPUTE 75 sec	Easy
PYQ 2025-Jan [14] · Pg 945	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [81] · Pg 946	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [84] · Pg 946 asked 2×	COMPUTE 75 sec	Easy
PYQ 2018-Nov [76] · Pg 941	COMPUTE 75 sec	Medium
PYQ 2020-Nov [72] · Pg 941	COMPUTE 75 sec	Medium
PYQ 2021-Jul [75] · Pg 942	COMPUTE 75 sec	Medium
PYQ 2023-Dec [81] · Pg 944	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [86] · Pg 946 asked 2×	COMPUTE 75 sec	Medium

SET UP 150 sec set it up before you compute — no question in this edition Analysis · Level II

- Overlapping card events (E_1 = king or queen, E_2 = queen or jack): write each as a set, find the intersection (queen), then judge exclusive/exhaustive.
- Verify 'mutually exclusive' and 'exhaustive' claims separately: empty intersection vs union = S.

Topic 6: Axiomatic or Modern Definition of Probability

P3-C15-U15-T06

Read first Read the axiomatic (modern) definition of probability: the three axioms - non-negativity, $P(S) = 1$, and additivity of probabilities for mutually exclusive events.

RECALL 30 sec know it or move on — no question in this edition Remembering · Level I

- Axioms: $P(A) \geq 0$; $P(S) = 1$; $P(A \cup B) = P(A) + P(B)$ when A and B are mutually exclusive.
- The sum of probabilities of mutually exclusive and exhaustive events equals 1.

COMPUTE 75 sec one formula, straight through · 2 questions Application · Level II

- For mutually exclusive A, B: $P(B) = P(A \cup B) - P(A)$; also A and B are mutually exclusive exactly when $P(A \cup B) = P(A) + P(B)$ - solve for the unknown x.

- Ratio conditions: if $P(A) = 2P(B) = 3P(C)$ with A, B, C mutually exclusive and exhaustive, set $P(A) = 6k$, $P(B) = 3k$, $P(C) = 2k$, use $11k = 1$, so $P(B) = 3/11$.

PYQ 2025-Jan [4] · Pg 948

COMPUTE
75 sec**Easy**

PYQ 2019-Nov [73] · Pg 947

COMPUTE
75 sec**Medium**

Topic 7: Addition Theorems

P3-C15-U15-T07

Read first Study the addition theorems: $P(A \text{ union } B) = P(A) + P(B)$ for mutually exclusive events, the general form $P(A \text{ union } B) = P(A) + P(B) - P(A \text{ intersection } B)$, and its extension to three events.

RECALL 30 sec know it or move on — no question in this edition Remembering · Level I

- General addition theorem: $P(A \text{ union } B) = P(A) + P(B) - P(A \text{ intersection } B)$; it reduces to $P(A) + P(B)$ only when A and B are mutually exclusive.
- Events that cannot occur simultaneously are mutually exclusive.
- Three events: $P(A \text{ union } B \text{ union } C) = P(A) + P(B) + P(C) - P(AB) - P(BC) - P(AC) + P(ABC)$.

COMPUTE 75 sec one formula, straight through · 16 questions Application · Level II

- Divisibility: $P(\text{multiple of } a \text{ or } b \text{ in } 1..N) = (\text{count of multiples of } a + \text{of } b - \text{of LCM})/N$, e.g. 3 or 7 in first 100 = $(33 + 14 - 4)/100$.
- Cards: $P(\text{club or king}) = 13/52 + 4/52 - 1/52 = 16/52 = 4/13$; king or queen = $8/52 = 2/13$.
- 'At least one' with independent solvers: $1 - \text{product of } (1 - p_i)$; 'at least two succeed' = sum of exactly-two cases + all-three case.
- Non-leap year: 53 Sundays, 53 Tuesdays, 53 Thursdays are mutually exclusive (one extra weekday), so probability = $1/7 + 1/7 + 1/7 = 3/7$.

PYQ 2019-Nov [74] · Pg 948

COMPUTE
75 sec**Easy**

PYQ 2023-Dec [79] · Pg 950

COMPUTE
75 sec**Easy**

PYQ 2023-Dec [80] · Pg 951

COMPUTE
75 sec**Easy**

PYQ 2024-Jun [81] · Pg 952

COMPUTE
75 sec**Easy**

PYQ 2025-May [81] · Pg 956

COMPUTE
75 sec**Easy**

PYQ 2026-Jan [91] · Pg 956

COMPUTE
75 sec**Easy**

MTP 2026-Apr S1 [79] · Pg 957	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [80] · Pg 957	COMPUTE 75 sec	Easy
PYQ 2026-May [93] · Pg 958	COMPUTE 75 sec	Easy
PYQ 2022-Jun [80] · Pg 949	COMPUTE 75 sec	Medium
PYQ 2023-Dec [78] · Pg 950	COMPUTE 75 sec	Medium
PYQ 2023-Dec [82] · Pg 951	COMPUTE 75 sec	Medium
PYQ 2024-Jun [85] · Pg 953	COMPUTE 75 sec	Medium
PYQ 2024-Sep [10] · Pg 954	COMPUTE 75 sec	Medium
PYQ 2024-Sep [14] · Pg 954	COMPUTE 75 sec	Medium
PYQ 2025-May [82] · Pg 955	COMPUTE 75 sec	Medium

Topic 8: Conditional Probability and Compound Theorem of Probability

P3-C15-U15-T08

Read first Study conditional probability $P(B/A) = P(A \text{ intersection } B)/P(A)$, the compound (multiplication) theorem, independence of events, and Bayes' theorem with prior and posterior probabilities.

RECALL 30 sec know it or move on · 3 questions Remembering · Level I

- $P(A/B) = P(A \text{ intersection } B)/P(B)$; compound theorem: $P(A \text{ intersection } B) = P(A) \times P(B/A) = P(B) \times P(A/B)$.
- A and B are independent iff $P(A \text{ intersection } B) = P(A) \times P(B)$.
- Bayes' theorem: $P(E_k/A) = P(E_k)P(A/E_k) / \text{sum of } P(E_i)P(A/E_i)$, where $E_1, E_2, \dots$ are mutually exclusive and exhaustive.
- Variance of a random variable: $V(x) = E(x - \mu)^2 = E[x - E(x)]^2 = E(x^2) - \mu^2$.

PYQ 2018-May [58] · Pg 958	RECALL 30 sec	Easy
PYQ 2019-Jun [70] · Pg 959	RECALL 30 sec	Easy
PYQ 2022-Dec [82] · Pg 962 asked 3x	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 1 question Understanding · Level I

- Distinguish mutually exclusive ($P(A \text{ intersection } B) = 0$) from independent ($P(A \text{ intersection } B) = P(A)P(B)$): compute $P(A)P(B)$ and compare with the given intersection.
- Independence is inherited by complements: if A, B are independent so are A' and B' , A and B' , etc.

PYQ 2026-Jan [39] · Pg 966

RECOGNISE
45 sec

Easy

COMPUTE 75 sec one formula, straight through · 19 questions Application · Level II

- Compute $P(A/B)$ or $P(B/A)$ directly from given $P(A)$, $P(B)$, $P(A \text{ intersection } B)$; convert between them via the common $P(A \text{ intersection } B)$.
- Percentage tables: $P(\text{Maths/Science}) = P(\text{Maths and Science})/P(\text{Science})$, e.g. $60\%/90\% = 2/3$.
- Total probability then Bayes: $P(\text{defective}) = \text{sum of } P(\text{company}) \times P(\text{defective/company})$; pick a box/urn at random then a ball: multiply $1/2$ by each box's ratio and add.

PYQ 2021-Jul [76] · Pg 960

COMPUTE
75 sec

Easy

PYQ 2025-Jan [5] · Pg 963

COMPUTE
75 sec

Easy

MTP 2025-Jan S2 [87] · Pg 963 asked 2×

COMPUTE
75 sec

Easy

PYQ 2026-Jan [90] · Pg 964

COMPUTE
75 sec

Easy

PYQ 2019-Jun [71] · Pg 959

COMPUTE
75 sec

Medium

PYQ 2021-Dec [78] · Pg 960

COMPUTE
75 sec

Medium

PYQ 2022-Jun [83] · Pg 961

COMPUTE
75 sec

Medium

PYQ 2022-Dec [79] · Pg 961

COMPUTE
75 sec

Medium

PYQ 2023-Jun [80] · Pg 962

COMPUTE
75 sec

Medium

MTP 2025-Jan S2 [89] · Pg 964 asked 2×

COMPUTE
75 sec

Medium

PYQ 2025-May [85] · Pg 964

COMPUTE
75 sec

Medium

PYQ 2026-Jan [41] · Pg 965

COMPUTE
75 sec

Medium

PYQ 2026-Jan [40] · Pg 967

COMPUTE
75 sec

Medium

MTP 2026-Apr S1 [82] · Pg 968

COMPUTE
75 sec

Medium

PYQ 2026-May [41] · Pg 968

COMPUTE

Medium

	75 sec	
PYQ 2026-May [95] · Pg 969	COMPUTE 75 sec	Medium
PYQ 2026-Sep [47] · Pg 970	COMPUTE 75 sec	Medium
PYQ 2026-Sep [48] · Pg 970	COMPUTE 75 sec	Medium
PYQ 2026-Sep [49] · Pg 970	COMPUTE 75 sec	Medium

SET UP 150 sec break down and compare · 1 question Analysis · Level II

MTP 2024-Aug S2 [84] · Pg 963	SET UP 150 sec	Hard
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Topic 9: Random Variable-Probability Distribution

P3-C15-U15-T09

Read first Study 'Random Variable - Probability Distribution': discrete vs continuous random variables, PMF conditions (each $p \geq 0$, $\sum = 1$) and the probability density function.

RECALL 30 sec know it or move on · 1 question Remembering · Level I

- A discrete PMF must satisfy $f(x) \geq 0$ and $\sum f(x) = 1$; a continuous pdf must integrate to 1 over its range.
- A binomial variable x with parameters n and p can take any integer value from 0 to n , both inclusive.
- Normal pdf: $f(x) = (1/(\sigma \sqrt{2\pi})) e^{-(x - \mu)^2 / (2\sigma^2)}$ for $-\infty < x < \infty$.

MTP 2024-Aug S2 [80] · Pg 972	RECALL 30 sec	Easy
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COMPUTE 75 sec one formula, straight through · 4 questions Application · Level II

- Find the constant: set total probability = 1, e.g. $P(X_i) = X_i/k$, $X_i = 1..9$ gives $k = 45$.
- Frequency tables: $P(x \geq 4) = \text{frequency for } x \geq 4 \text{ over total frequency}$.
- Binomial tails: at least 4 of 6 pass, $p = 0.7$: add $C(6,x)p^x q^{(6-x)}$ for $x = 4, 5, 6$.
- Read μ , σ off a normal pdf, then $Q1 = \mu - 0.675 \sigma$.

PYQ 2019-Nov [76] · Pg 971	COMPUTE 75 sec	Easy
PYQ 2024-Jun [80] · Pg 971	COMPUTE 75 sec	Easy
PYQ 2026-Sep [24] · Pg 973	COMPUTE 75 sec	Easy

MTP 2024-Aug S2 [82] · Pg 972 asked 2×

COMPUTE
75 sec

Hard

SET UP 150 sec set it up before you compute · 1 question Analysis · Level II

- PMF tables in k (k , $2k + k^2$, $3k$, ...): impose $\sum = 1$, solve the quadratic for $k \geq 0$, then find the mean.
- Conditions like $2P(X=2) = P(X=3)$ with mean $10/3$: convert to equations in n , p , solve, then compute the asked probability.
- Normal word problems (mean ₹1,800, SD ₹300): standardise $z = (x - \mu)/\sigma$ and use table areas.

PYQ 2025-Sep [90] · Pg 972

SET UP
150 sec

Medium

Topic 10: Expected Value of a Random Variable

P3-C15-U15-T10

Read first Study 'Expected Value of a Random Variable': $\mu = E(x) = \sum p_i x_i$, $E(x^2)$, variance $= E(x^2) - \mu^2$, and the properties $E(k) = k$, $E(x + y) = E(x) + E(y)$, and $E(xy) = E(x)E(y)$ for independent variables.

RECALL 30 sec memorise · 2 questions Remembering · Level I

PYQ 2018-May [60] · Pg 973

RECALL
30 sec

Easy

MTP 2024-Aug S2 [81] · Pg 976

RECALL
30 sec

Easy

COMPUTE 75 sec one formula, straight through · 7 questions Application · Level II

- Discrete expectation: $E(x) = \sum x \text{ times } P(x)$ straight from the table; for a two-point distribution at 1 and 0 with probabilities p and $1 - p$, mean $= p$.
- SD of a distribution: compute $E(x^2)$, subtract $[E(x)]^2$, take the square root.
- Linearity: $E(x - y) = E(x) - E(y)$, e.g. $4.5 - 2.5 = 2$; sum of two dice: $E = 3.5 + 3.5 = 7$.
- Business ventures: $E(\text{profit}) = ₹50,000 \times P(\text{profit}) - ₹20,000 \times P(\text{loss})$; 'at least one six in 3 throws' $= 1 - (5/6)^3$.

PYQ 2023-Jun [85] · Pg 974

COMPUTE
75 sec

Easy

PYQ 2023-Jun [86] · Pg 974

COMPUTE
75 sec

Easy

MTP 2024-Aug S2 [88] · Pg 976

COMPUTE
75 sec

Easy

PYQ 2026-Sep [25] · Pg 977

COMPUTE
75 sec

Easy

PYQ 2021-Dec [81] · Pg 974 asked 2x	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [88] · Pg 976	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [86] · Pg 977	COMPUTE 75 sec	Hard

SET UP 150 sec set it up before you compute · 1 question Analysis · Level II

- When a cumulative probability function is given, first difference successive values to recover individual probabilities, then compute $E(x)$.
- Payoff problems: list each monetary outcome with its probability (watch signs for losses) before computing; a negative expectation means an expected loss.

PYQ 2024-Jun [83] · Pg 975	SET UP 150 sec	Medium
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CHAPTER 16

Theoretical Distributions

4 Topics · 121 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 64 sec a question on average — **faster than the paper**

RECALL Remembering	20.2%	30 sec	19 of 94 past-exam questions
RECOGNISE Understanding	5.3%	45 sec	5 of 94 past-exam questions
COMPUTE Application	74.5%	75 sec	70 of 94 past-exam questions

Topic 1: Introduction

P3-C16-U16-T01

Read first Read the introduction to Theoretical Distributions: why probability models replace observed frequency distributions, and their classification into discrete (Binomial, Poisson) and continuous (Normal) distributions.

RECALL 30 sec know it or move on · 1 question Remembering · Level I

- A probability distribution may be discrete or continuous: discrete examples are Binomial and Poisson; the Normal distribution is continuous.
- A discrete distribution is described by a probability mass function; a continuous one by a probability density function.

PYQ 2018-May [65] · Pg 982

RECALL
30 sec

Easy

Topic 2: Binomial Distribution

P3-C16-U16-T02

Read first Study the Binomial Distribution section: the pmf $f(x) = nCx p^x q^{(n-x)}$, the important points (biparametric nature, mean np , variance npq , mode, skewness, additive property) and the applied/fitting examples.

RECALL 30 sec know it or move on · 9 questions Remembering · Level I

- $f(x) = nCx p^x q^{(n-x)}$, $x = 0..n$, $q = 1 - p$; mean = np , variance = npq , SD = $\sqrt{npq}$; variance < mean always.

- Biparametric discrete distribution with parameters n and p ; symmetrical when $p = 0.5$, positively skewed when $p < 1/2$.
- Mode: two modes $(n+1)p$ and $(n+1)p - 1$ if $(n+1)p$ is an integer, else the largest integer in $(n+1)p$.

PYQ 2018-May [61] · Pg 982	RECALL 30 sec	Easy
PYQ 2018-May [64] · Pg 983	RECALL 30 sec	Easy
PYQ 2018-Nov [78] · Pg 983	RECALL 30 sec	Easy
PYQ 2019-Jun [78] · Pg 984	RECALL 30 sec	Easy
PYQ 2020-Nov [74] · Pg 985	RECALL 30 sec	Easy
PYQ 2022-Jun [87] · Pg 987	RECALL 30 sec	Easy
PYQ 2022-Dec [87] · Pg 987	RECALL 30 sec	Easy
MTP 2024-Aug S2 [85] · Pg 991	RECALL 30 sec	Easy
RTP 2024-Sep [24] · Pg 991	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 2 questions Understanding · Level I

- Recognise binomial setups: fixed n independent trials, two outcomes, constant p (e.g. defectives in a fixed sample).
- Fact-check option statements against bounds: correlation cannot exceed 1; for $X \sim N(50, 16)$, $P(X < 60)$ cannot be below $P(X < 50) = 0.50$.

PYQ 2024-Jun [87] · Pg 990	RECOGNISE 45 sec	Easy
PYQ 2025-Jan [8] · Pg 994	RECOGNISE 45 sec	Medium

COMPUTE 75 sec one formula, straight through · 30 questions Application · Level II

- Recover parameters from moments: $q = \text{variance}/\text{mean}$, $p = 1 - q$, $n = \text{mean}/p$ (mean 5, variance 3 gives $q = 3/5$, so $p < q$).
- Direct probabilities: exactly 2 heads in 6 tosses = $6C2(1/2)^6 = 0.2343$; expected heads = np ; SD of heads in 100 tosses = $\sqrt{npq} = 5$.
- Mode: compute $(n+1)p$ and apply the one/two-mode rule.
- Ratio conditions like $P(x=2) = 3P(x=3)$ with $n = 4$: form the ratio of pmf terms, cancel, solve for p .

PYQ 2019-Jun [74] · Pg 983	COMPUTE	Easy
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	75 sec	
PYQ 2021-Jan [75] · Pg 985	COMPUTE 75 sec	Easy
PYQ 2021-Dec [86] · Pg 987 asked 2×	COMPUTE 75 sec	Easy
PYQ 2023-Dec [84] · Pg 988	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [79] · Pg 991 asked 2×	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [81] · Pg 991	COMPUTE 75 sec	Easy
RTP 2025-Jan [24] · Pg 994	COMPUTE 75 sec	Easy
PYQ 2025-Sep [88] · Pg 995	COMPUTE 75 sec	Easy
PYQ 2026-Jan [44] · Pg 995	COMPUTE 75 sec	Easy
PYQ 2026-Jan [96] · Pg 995	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [83] · Pg 997	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [86] · Pg 997	COMPUTE 75 sec	Easy
PYQ 2026-May [48] · Pg 997	COMPUTE 75 sec	Easy
PYQ 2026-May [44] · Pg 998	COMPUTE 75 sec	Easy
PYQ 2026-May [45] · Pg 998	COMPUTE 75 sec	Easy
PYQ 2026-Sep [99] · Pg 999	COMPUTE 75 sec	Easy
PYQ 2019-Nov [79] · Pg 985	COMPUTE 75 sec	Medium
PYQ 2021-Jul [83] · Pg 986	COMPUTE 75 sec	Medium
PYQ 2023-Jun [87] · Pg 987	COMPUTE 75 sec	Medium
PYQ 2023-Dec [85] · Pg 988	COMPUTE 75 sec	Medium
PYQ 2023-Dec [87] · Pg 989	COMPUTE 75 sec	Medium
PYQ 2024-Jun [90] · Pg 990	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [85] · Pg 992 asked 2×	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [88] · Pg 992	COMPUTE	Medium

	75 sec	
PYQ 2025-Jan [1] · Pg 992	COMPUTE 75 sec	Medium
PYQ 2025-Jan [6] · Pg 993	COMPUTE 75 sec	Medium
PYQ 2025-Jan [12] · Pg 993	COMPUTE 75 sec	Medium
RTP 2025-Jan [25] · Pg 994 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-Sep [86] · Pg 994	COMPUTE 75 sec	Medium
PYQ 2026-Jan [95] · Pg 996	COMPUTE 75 sec	Medium

Topic 3: Poisson Distribution

P3-C16-U16-T03

Read first Study the Poisson Distribution section: the Poisson model conditions, pmf $f(x) = e^{-m} \frac{m^x}{x!}$, mean = variance = m , mode, and Poisson as the limit of binomial when n is large, p small, $np = m$.

RECALL 30 sec know it or move on · 2 questions Remembering · Level I

- $f(x) = e^{-m} \frac{m^x}{x!}$, $x = 0, 1, 2, \dots$; mean = variance = m , SD = $\sqrt{m}$; second central moment $\mu_2 = m$.
- Poisson is THE uniparametric distribution (parameter m); binomial is biparametric discrete, normal biparametric continuous.
- Mode: two modes m and $m - 1$ if m is an integer, else the largest integer in m .

PYQ 2019-Nov [78] · Pg 1003 asked 4×	RECALL 30 sec	Easy
PYQ 2021-Jan [77] · Pg 1005 asked 2×	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 4 questions Understanding · Level I

- Poisson fits counts of rare events per unit time/space: misprints per page, defects, accidents, calls per interval - not continuous traits like height.
- Model conditions: independent occurrences, chance of one success in a tiny interval proportional to its length, more than one success negligible - spot the false condition among options.

PYQ 2020-Nov [76] · Pg 1003	RECOGNISE 45 sec	Easy
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MTP 2025-Jan S2 [92] · Pg 1015 asked 2×	RECOGNISE 45 sec	Easy
PYQ 2025-May [87] · Pg 1015	RECOGNISE 45 sec	Easy
MTP 2024-Jun S3 [82] · Pg 1013	RECOGNISE 45 sec	Medium

COMPUTE 75 sec one formula, straight through · 37 questions Application · Level II

- Ratio equations: cancel $e^{(-m)}$, e.g. $P(x=2) = P(x=3)$ gives $m = 3$; $P(x=4) = P(x=5)$ gives $m = 5$; solve the power equation for m .
- Binomial-to-Poisson: $m = np$, e.g. 4 coins, 1600 tosses, $p = 1/16$ gives $m = 100$, so $P(\text{never all heads}) = e^{(-100)}$.
- For binomial with variance = $(\text{mean})^2$, solve $npq = n^2p^2$ to get n and p .

PYQ 2019-Jun [75] · Pg 1002	COMPUTE 75 sec	Easy
PYQ 2019-Nov [80] · Pg 1003	COMPUTE 75 sec	Easy
PYQ 2021-Jul [81] · Pg 1006	COMPUTE 75 sec	Easy
PYQ 2021-Dec [85] · Pg 1007	COMPUTE 75 sec	Easy
PYQ 2022-Dec [86] · Pg 1010	COMPUTE 75 sec	Easy
PYQ 2022-Dec [88] · Pg 1011	COMPUTE 75 sec	Easy
PYQ 2023-Jun [89] · Pg 1012	COMPUTE 75 sec	Easy
PYQ 2024-Jun [88] · Pg 1012	COMPUTE 75 sec	Easy
PYQ 2024-Sep [16] · Pg 1013	COMPUTE 75 sec	Easy
MTP 2024-Dec S1 [89] · Pg 1014	COMPUTE 75 sec	Easy
PYQ 2025-Jan [7] · Pg 1014	COMPUTE 75 sec	Easy
PYQ 2026-May [94] · Pg 1019	COMPUTE 75 sec	Easy
PYQ 2018-Nov [77] · Pg 1000 asked 3×	COMPUTE 75 sec	Medium
PYQ 2018-Nov [81] · Pg 1001	COMPUTE 75 sec	Medium
PYQ 2019-Jun [73] · Pg 1001	COMPUTE 75 sec	Medium

PYQ 2020-Nov [77] · Pg 1003	COMPUTE 75 sec	Medium
PYQ 2020-Nov [79] · Pg 1004	COMPUTE 75 sec	Medium
PYQ 2021-Jan [76] · Pg 1005	COMPUTE 75 sec	Medium
PYQ 2021-Jul [80] · Pg 1006	COMPUTE 75 sec	Medium
PYQ 2021-Jul [82] · Pg 1007	COMPUTE 75 sec	Medium
PYQ 2021-Dec [87] · Pg 1008	COMPUTE 75 sec	Medium
PYQ 2021-Dec [90] · Pg 1009	COMPUTE 75 sec	Medium
PYQ 2022-Jun [85] · Pg 1010	COMPUTE 75 sec	Medium
PYQ 2023-Jun [88] · Pg 1011	COMPUTE 75 sec	Medium
PYQ 2024-Sep [19] · Pg 1013	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [88] · Pg 1015 asked 2×	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [93] · Pg 1015 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-May [90] · Pg 1016	COMPUTE 75 sec	Medium
PYQ 2025-Sep [89] · Pg 1016	COMPUTE 75 sec	Medium
PYQ 2026-Jan [93] · Pg 1017	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [84] · Pg 1018	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [87] · Pg 1018	COMPUTE 75 sec	Medium
MTP 2026-Apr S2 [81] · Pg 1018	COMPUTE 75 sec	Medium
RTP 2026-May [27] · Pg 1019	COMPUTE 75 sec	Medium
PYQ 2026-Sep [98] · Pg 1019	COMPUTE 75 sec	Medium
PYQ 2018-May [62] · Pg 999	COMPUTE 75 sec	Hard
PYQ 2021-Dec [89] · Pg 1008	COMPUTE 75 sec	Hard

Topic 4: Normal Distribution or Gaussian Distribution

P3-C16-U16-T04

Read first Study the Normal Distribution section: the pdf, standard normal variate $z = (x - \mu)/\sigma$, its properties (mean = median = mode, MD/QD relations, points of inflexion, area rules) and the additive property.

RECALL 30 sec know it or move on · 13 questions · Remembering · Level I

- Mean = median = mode = μ ; bell-shaped symmetric curve, skewness 0, third central moment 0, total area 1; standard normal: $\mu = 0$, $\sigma = 1$.
- Areas: $\mu \pm \sigma = 68.27\%$, $\mu \pm 2\sigma = 95.45\%$, $\mu \pm 3\sigma = 99.73\%$; $z = -1.96$ to 1.96 covers 95%.
- MD = 0.8σ , QD = 0.675σ , so SD : MD : QD = 15 : 12 : 10; Q1, Q3 = $\mu \pm 0.675\sigma$.
- Independent normals add: $x + y \sim N(\mu_1 + \mu_2, \sigma_1^2 + \sigma_2^2)$.

PYQ 2019-Jun [76] · Pg 1021	RECALL 30 sec	Easy
PYQ 2019-Nov [83] · Pg 1023 asked 2×	RECALL 30 sec	Easy
PYQ 2021-Jan [78] · Pg 1024	RECALL 30 sec	Easy
PYQ 2021-Jul [79] · Pg 1024	RECALL 30 sec	Easy
PYQ 2022-Dec [85] · Pg 1026	RECALL 30 sec	Easy
PYQ 2023-Dec [83] · Pg 1026	RECALL 30 sec	Easy
PYQ 2023-Dec [86] · Pg 1026	RECALL 30 sec	Easy
PYQ 2024-Jun [89] · Pg 1027 asked 2×	RECALL 30 sec	Easy
MTP 2024-Jun S3 [80] · Pg 1027 asked 2×	RECALL 30 sec	Easy
MTP 2024-Jun S3 [85] · Pg 1028	RECALL 30 sec	Easy
MTP 2024-Aug S2 [89] · Pg 1028	RECALL 30 sec	Easy
MTP 2024-Dec S1 [75] · Pg 1029 asked 3×	RECALL 30 sec	Easy
PYQ 2025-Jan [10] · Pg 1030	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 2 questions Understanding · Level I

- Changing μ shifts and σ stretches the curve but the bell shape never changes - unlike binomial/Poisson whose shape depends on parameters.
- By symmetry $\phi(-k) = 1 - \phi(k)$, $\phi(0) = 0.5$; area 0 to 1 = 0.3413 means $\phi(1) = 0.8413$.

PYQ 2020-Nov [75] · Pg 1023

RECOGNISE
45 sec

Easy

MTP 2024-Dec S1 [87] · Pg 1030

RECOGNISE
45 sec

Easy

COMPUTE 75 sec one formula, straight through · 21 questions Application · Level II

- Median = $(Q1 + Q3)/2$, e.g. $(54.52 + 78.86)/2 = 66.69$; QD = 0.675 σ ; MD = 0.8 σ (variance 16 gives MD = 3.2).
- Points of inflexion are $\mu \pm \sigma$: from 40 and 60 get $\mu = 50$, $\sigma = 10$; or read μ , σ by matching a given pdf to the standard form.
- Probabilities/counts: standardise $z = (x - \mu)/\sigma$, apply given ϕ /area values with symmetry (e.g. 100 students, mean 50, SD 14.9).

PYQ 2018-May [66] · Pg 1020

COMPUTE
75 sec

Easy

PYQ 2018-Nov [79] · Pg 1020

COMPUTE
75 sec

Easy

PYQ 2018-Nov [80] · Pg 1021 asked 2×

COMPUTE
75 sec

Easy

PYQ 2019-Nov [77] · Pg 1022

COMPUTE
75 sec

Easy

PYQ 2020-Nov [78] · Pg 1024

COMPUTE
75 sec

Easy

PYQ 2022-Jun [86] · Pg 1025

COMPUTE
75 sec

Easy

PYQ 2024-Sep [17] · Pg 1029

COMPUTE
75 sec

Easy

PYQ 2024-Sep [18] · Pg 1029 asked 2×

COMPUTE
75 sec

Easy

RTP 2025-Jan [30] · Pg 1030 asked 2×

COMPUTE
75 sec

Easy

PYQ 2025-May [88] · Pg 1031

COMPUTE
75 sec

Easy

PYQ 2025-Sep [87] · Pg 1031

COMPUTE
75 sec

Easy

PYQ 2026-Jan [94] · Pg 1032

COMPUTE
75 sec

Easy

PYQ 2026-May [43] · Pg 1032

COMPUTE
75 sec

Easy

PYQ 2026-Sep [100] · Pg 1034	COMPUTE 75 sec	Easy
PYQ 2019-Jun [77] · Pg 1021 asked 2×	COMPUTE 75 sec	Medium
PYQ 2019-Nov [82] · Pg 1022	COMPUTE 75 sec	Medium
PYQ 2021-Dec [88] · Pg 1024	COMPUTE 75 sec	Medium
MTP 2024-Jun S3 [84] · Pg 1027	COMPUTE 75 sec	Medium
PYQ 2024-Sep [15] · Pg 1028	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [91] · Pg 1030 asked 2×	COMPUTE 75 sec	Medium
PYQ 2026-May [47] · Pg 1033	COMPUTE 75 sec	Medium

CHAPTER 17

Correlation and Regression

5 Topics · 124 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **COMPUTE** · 59 sec a question on average — **faster than the paper**

RECALL Remembering	24.7%	30 sec	24 of 97 past-exam questions
RECOGNISE Understanding	17.5%	45 sec	17 of 97 past-exam questions
COMPUTE Application	57.7%	75 sec	56 of 97 past-exam questions

Topic 1: Correlation Analysis

P3-C17-U17-T01

Read first Read the introduction to bivariate data and Correlation Analysis (SM 17.1-17.2): meaning of positive/negative correlation, covariance, spurious correlation, and the properties of the correlation coefficient.

RECALL 30 sec know it or move on · 5 questions Remembering · Level I

- $\text{Cov}(x, y) = \text{Sum}[(x - \bar{x})(y - \bar{y})]/n = \text{Sum}(xy)/n - \bar{x}\bar{y}$; unlike variance it can be positive, negative or zero.
- Positive correlation: both variables move in the same direction; negative: opposite directions.
- Spurious (nonsense) correlation = correlation between two variables having no causal relationship, usually induced by a third variable (e.g. time).

PYQ 2020-Nov [80] · Pg 1039 asked 4×	RECALL 30 sec	Easy
PYQ 2020-Nov [82] · Pg 1039 asked 2×	RECALL 30 sec	Easy
MTP 2024-Jun S3 [69] · Pg 1039	RECALL 30 sec	Easy
RTP 2025-Jan [22] · Pg 1041	RECALL 30 sec	Easy
PYQ 2025-Sep [92] · Pg 1041	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 6 questions Understanding · Level I

- Judge the sign of r from context: speed vs stopping distance and temperature vs power consumption are positive; insurance profits vs claims paid is negative.

- Scatter pattern: points from lower-left to upper-right = positive; upper-left to lower-right = negative; a constant increase in a series graphs as a straight line rising left to right.
- r is unaffected by adding/subtracting constants (change of origin); multiplying BOTH variables by -1 leaves r unchanged (0.6 stays 0.6) - sign flips only if the two scale factors have opposite signs.

PYQ 2018-May [72] · Pg 1038	RECOGNISE 45 sec	Easy
PYQ 2019-Nov [87] · Pg 1038 asked 2×	RECOGNISE 45 sec	Easy
PYQ 2024-Sep [22] · Pg 1040	RECOGNISE 45 sec	Easy
PYQ 2025-May [91] · Pg 1041	RECOGNISE 45 sec	Easy
MTP 2026-Apr S1 [93] · Pg 1042	RECOGNISE 45 sec	Easy
MTP 2026-Apr S2 [91] · Pg 1042	RECOGNISE 45 sec	Easy

COMPUTE 75 sec one formula, straight through · 2 questions Application · Level II

- Cov from aggregate sums: first get $\text{Sum}(xy) = [\text{Sum}(x+y)^2 - \text{Sum}(x^2) - \text{Sum}(y^2)]/2$, then $\text{Cov} = \text{Sum}(xy)/n - \bar{x}\bar{y}$.

MTP 2025-Jan S2 [78] · Pg 1041 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-Jan [11] · Pg 1040	COMPUTE 75 sec	Medium

Topic 2: Measures of Correlation

P3-C17-U17-T02

Read first Study SM 17.2.4: the four measures - scatter diagram, Karl Pearson's product moment correlation coefficient (with its three properties), Spearman's rank correlation and coefficient of concurrent deviations, plus coefficient of determination.

RECALL 30 sec know it or move on · 13 questions Remembering · Level I

- Karl Pearson: $r = \text{Cov}(x, y)/(\text{Sx } \text{Sy})$; unit-free; $-1 \leq r \leq +1$ inclusive; for linear, quantitative (ungrouped) data.
- Spearman: $r_R = 1 - 6\text{Sum}(d^2)/[n(n^2 - 1)]$; lies in $[-1, +1]$; used for ranks/qualitative characteristics.
- Concurrent deviations uses only the DIRECTION of change: $r_C = +/\sqrt{+/(2c - m)/m}$; scatter diagram plots quantitative data.

PYQ 2018-May [70] · Pg 1042	RECALL	Easy
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	30 sec	
PYQ 2018-May [71] · Pg 1043	RECALL 30 sec	Easy
PYQ 2018-May [74] · Pg 1043	RECALL 30 sec	Easy
PYQ 2019-Jun [82] · Pg 1044	RECALL 30 sec	Easy
PYQ 2022-Jun [89] · Pg 1050	RECALL 30 sec	Easy
PYQ 2022-Jun [92] · Pg 1052	RECALL 30 sec	Easy
PYQ 2022-Jun [93] · Pg 1052	RECALL 30 sec	Easy
PYQ 2022-Dec [93] · Pg 1053	RECALL 30 sec	Easy
PYQ 2023-Jun [91] · Pg 1055	RECALL 30 sec	Easy
PYQ 2023-Dec [89] · Pg 1055	RECALL 30 sec	Easy
PYQ 2024-Jun [93] · Pg 1057	RECALL 30 sec	Easy
PYQ 2024-Jun [94] · Pg 1057	RECALL 30 sec	Easy
MTP 2024-Jun S3 [97] · Pg 1058	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 8 questions Understanding · Level I

- Scatter diagram shows existence and type (linear/non-linear) of correlation but NOT its numerical value; evenly spread points mean $r = 0$.
- Line from lower-left to upper-right means $r = +1$; an exact relation $ax + by = c$ gives $r = \pm 1$ ($4x + 3y = 7$ is perfect negative).
- If $\sum[(x - \bar{x})(y - \bar{y})] = 0$ then $r = 0$.

PYQ 2018-May [67] · Pg 1042 asked 2x	RECOGNISE 45 sec	Easy
PYQ 2020-Nov [81] · Pg 1047	RECOGNISE 45 sec	Easy
PYQ 2021-Jul [87] · Pg 1049	RECOGNISE 45 sec	Easy
PYQ 2021-Dec [91] · Pg 1049	RECOGNISE 45 sec	Easy
PYQ 2022-Jun [90] · Pg 1051	RECOGNISE 45 sec	Easy
MTP 2024-Dec S1 [91] · Pg 1059	RECOGNISE 45 sec	Easy

MTP 2024-Dec S1 [92] · Pg 1059	RECOGNISE 45 sec	Easy
PYQ 2025-Sep [94] · Pg 1061	RECOGNISE 45 sec	Easy

COMPUTE 75 sec one formula, straight through · 31 questions Application · Level II

- Drill $r = \text{Cov}(S_x S_y)$ and rearrangements (find S_y from r , Cov , S_x); $r = \pm \sqrt{\text{byxbxy}}$ with the common sign of the coefficients.
- Rank correlation: r_R from $\text{Sum}(d^2)$ and n ; solve backwards for n or $\text{Sum}(d^2)$; corrected-rank problems (swap wrong d^2 for the right one).
- Origin/scale change: $|r|$ never changes; sign flips only when the two scale factors differ in sign.
- $r^2 = \text{coefficient of determination}$, $1 - r^2 = \text{non-determination}$; population limits $r \pm \text{PE}$, $\text{PE} = 0.6745(1 - r^2)/\sqrt{n}$.

PYQ 2019-Jun [83] · Pg 1044	COMPUTE 75 sec	Easy
PYQ 2021-Jan [80] · Pg 1048	COMPUTE 75 sec	Easy
PYQ 2022-Dec [91] · Pg 1052	COMPUTE 75 sec	Easy
PYQ 2023-Dec [90] · Pg 1055	COMPUTE 75 sec	Easy
PYQ 2024-Jun [91] · Pg 1056	COMPUTE 75 sec	Easy
PYQ 2024-Jun [92] · Pg 1056	COMPUTE 75 sec	Easy
RTP 2024-Sep [29] · Pg 1059 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-May [92] · Pg 1059	COMPUTE 75 sec	Easy
PYQ 2025-May [94] · Pg 1060	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [79] · Pg 1060 asked 3×	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [97] · Pg 1060 asked 2×	COMPUTE 75 sec	Easy
RTP 2026-May [20] · Pg 1064	COMPUTE 75 sec	Easy
PYQ 2026-May [46] · Pg 1064	COMPUTE 75 sec	Easy
PYQ 2026-Sep [74] · Pg 1065	COMPUTE 75 sec	Easy
PYQ 2019-Jun [80] · Pg 1043	COMPUTE 75 sec	Medium

PYQ 2019-Jun [84] · Pg 1045	COMPUTE 75 sec	Medium
PYQ 2019-Nov [85] · Pg 1045	COMPUTE 75 sec	Medium
PYQ 2019-Nov [86] · Pg 1046	COMPUTE 75 sec	Medium
PYQ 2021-Jan [79] · Pg 1047	COMPUTE 75 sec	Medium
PYQ 2022-Jun [88] · Pg 1050	COMPUTE 75 sec	Medium
PYQ 2022-Jun [91] · Pg 1051	COMPUTE 75 sec	Medium
PYQ 2022-Dec [92] · Pg 1052	COMPUTE 75 sec	Medium
PYQ 2023-Jun [90] · Pg 1054	COMPUTE 75 sec	Medium
PYQ 2024-Jun [95] · Pg 1057	COMPUTE 75 sec	Medium
PYQ 2024-Sep [23] · Pg 1058	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [90] · Pg 1059	COMPUTE 75 sec	Medium
MTP 2025-Jan S2 [80] · Pg 1060 asked 2×	COMPUTE 75 sec	Medium
PYQ 2026-Jan [99] · Pg 1062	COMPUTE 75 sec	Medium
PYQ 2026-May [99] · Pg 1065	COMPUTE 75 sec	Medium
PYQ 2025-Sep [93] · Pg 1060	COMPUTE 75 sec	Hard
PYQ 2026-Jan [97] · Pg 1063	COMPUTE 75 sec	Hard

Topic 3: Regression Analysis

P3-C17-U17-T03

Read first Study SM 17.3: least-squares line of best fit, normal equations, regression coefficients $b_{yx} = rS_y/S_x$ and $b_{xy} = rS_x/S_y$, and identifying the two regression lines from a given pair of equations.

RECALL 30 sec know it or move on · 2 questions Remembering · Level I

- Regression line of y on x : $y - \bar{y} = b_{yx}(x - \bar{x})$, $b_{yx} = \text{Cov}(x, y)/S_x^2 = rS_y/S_x$; similarly $b_{xy} = rS_x/S_y$.
- Regression coefficients are independent of change of ORIGIN but not of SCALE.
- AM of the two regression coefficients $\geq r$; r lies between -1 and +1 including both.

PYQ 2019-Jun [79] · Pg 1067	RECALL 30 sec	Easy
MTP 2024-Dec S1 [94] · Pg 1076	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 6 questions Understanding · Level I

- byx $b_{yx} = r^2 \leq 1$, so if $b_{yx} > 1$ then b_{yx} must be less than 1; both coefficients always carry the same sign.
- In $y = a + bx$ the slope is horizontal when $b = 0$; $r^2 = 1 - (\text{unexplained}/\text{total})$ is a valid relation.

PYQ 2018-May [73] · Pg 1066	RECOGNISE 45 sec	Easy
PYQ 2021-Jul [85] · Pg 1068	RECOGNISE 45 sec	Easy
PYQ 2023-Dec [91] · Pg 1073	RECOGNISE 45 sec	Easy
PYQ 2024-Sep [21] · Pg 1075	RECOGNISE 45 sec	Easy
MTP 2024-Dec S1 [95] · Pg 1076	RECOGNISE 45 sec	Easy
PYQ 2024-Sep [20] · Pg 1074	RECOGNISE 45 sec	Medium

COMPUTE 75 sec one formula, straight through · 25 questions Application · Level II

- Means of x and y : solve the two regression equations simultaneously - the lines intersect at $(\bar{x}, \bar{y})$.
- r from two lines: compute b_{yx}, b_{xy} ; if their product exceeds 1, swap the line roles; $r = \pm\sqrt{b_{yx}b_{xy}}$ with the common sign ($4x+3y+7=0, 3x+4y+8=0$ gives $r = -0.75$).
- b_{xy} from the x -on- y equation by rewriting x in terms of y ($3x + 2y = 100$ gives $b_{xy} = -2/3$); predict $y = \text{intercept} + \text{slope}x$.
- Fit from data: $b_{yx} = (n\sum(xy) - \sum(x)\sum(y))/(n\sum(x^2) - (\sum(x))^2)$, $a = \bar{y} - b_{yx}\bar{x}$; when $r = \pm 1$ the lines coincide.

PYQ 2021-Jul [84] · Pg 1068	COMPUTE 75 sec	Easy
PYQ 2021-Jul [88] · Pg 1069	COMPUTE 75 sec	Easy
PYQ 2025-Jan [23] · Pg 1076	COMPUTE 75 sec	Easy
PYQ 2025-Jan [19] · Pg 1077	COMPUTE 75 sec	Easy
PYQ 2025-May [93] · Pg 1077	COMPUTE 75 sec	Easy
PYQ 2026-Jan [45] · Pg 1079 asked 2x	COMPUTE 75 sec	Easy

PYQ 2018-Nov [83] · Pg 1066	COMPUTE 75 sec	Medium
PYQ 2019-Nov [84] · Pg 1067 asked 2×	COMPUTE 75 sec	Medium
PYQ 2021-Jan [82] · Pg 1067	COMPUTE 75 sec	Medium
PYQ 2021-Dec [92] · Pg 1069	COMPUTE 75 sec	Medium
PYQ 2022-Dec [89] · Pg 1070	COMPUTE 75 sec	Medium
PYQ 2022-Dec [90] · Pg 1070	COMPUTE 75 sec	Medium
PYQ 2023-Jun [92] · Pg 1071	COMPUTE 75 sec	Medium
PYQ 2023-Jun [94] · Pg 1072	COMPUTE 75 sec	Medium
PYQ 2023-Dec [88] · Pg 1073	COMPUTE 75 sec	Medium
PYQ 2023-Dec [92] · Pg 1073	COMPUTE 75 sec	Medium
MTP 2024-Dec S1 [93] · Pg 1075	COMPUTE 75 sec	Medium
PYQ 2025-Jan [15] · Pg 1076	COMPUTE 75 sec	Medium
PYQ 2025-Sep [95] · Pg 1077	COMPUTE 75 sec	Medium
PYQ 2025-Sep [91] · Pg 1078	COMPUTE 75 sec	Medium
MTP 2026-Apr S1 [91] · Pg 1079	COMPUTE 75 sec	Medium
PYQ 2026-May [97] · Pg 1079	COMPUTE 75 sec	Medium
PYQ 2026-Sep [50] · Pg 1080	COMPUTE 75 sec	Medium
PYQ 2026-Sep [71] · Pg 1080	COMPUTE 75 sec	Medium
PYQ 2026-Sep [73] · Pg 1080	COMPUTE 75 sec	Medium

Topic 4: Properties of Regression Lines

P3-C17-U17-T04

Read first Study the properties listed at the end of SM 17.3: intersection of the regression lines at the means, r as GM of the regression coefficients, effect of origin/scale, and the special cases $r = 0$ and $r = \pm 1$.

RECALL 30 sec know it or move on · 9 questions Remembering · Level I

- The two regression lines intersect at $(\bar{x}, \bar{y})$ - the means of x and y .
- r is the (simple) GEOMETRIC mean of b_{yx} and b_{xy} , with their common sign; regression coefficients are unchanged by shift of origin but change with shift of scale.
- Lines coincide (become identical) when $r = +1$ or -1 ; they are perpendicular when $r = 0$ (uncorrelated variables).

PYQ 2018-Nov [82] · Pg 1081	RECALL 30 sec	Easy
PYQ 2021-Jan [81] · Pg 1081	RECALL 30 sec	Easy
PYQ 2021-Jan [83] · Pg 1082	RECALL 30 sec	Easy
PYQ 2021-Dec [94] · Pg 1082 asked 2×	RECALL 30 sec	Easy
PYQ 2023-Jun [93] · Pg 1082	RECALL 30 sec	Easy
MTP 2024-Jun S3 [78] · Pg 1083	RECALL 30 sec	Easy
MTP 2024-Aug S2 [91] · Pg 1083 asked 2×	RECALL 30 sec	Easy
RTP 2025-Jan [23] · Pg 1085	RECALL 30 sec	Easy
PYQ 2026-Sep [72] · Pg 1088	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 4 questions Understanding · Level I

- If one regression coefficient is more than unity, the other must be less than unity (product = $r^2 \leq 1$).
- Under $u = 2x - 4$, $v = 3 - 2y$ the scales are $+2$ and -2 , so r changes sign: 0.5 becomes -0.5 .
- If the lines intersect on the X -axis, then $\bar{y} = 0$.

MTP 2024-Jun S3 [96] · Pg 1083	RECOGNISE 45 sec	Easy
MTP 2025-Jan S2 [77] · Pg 1085 asked 2×	RECOGNISE 45 sec	Easy
PYQ 2018-Nov [85] · Pg 1081	RECOGNISE 45 sec	Medium
PYQ 2021-Dec [93] · Pg 1082	RECOGNISE 45 sec	Medium

COMPUTE 75 sec one formula, straight through · 9 questions Application · Level II

- From two lines get b_{yx} , b_{xy} , then $r = \pm \sqrt{b_{yx}b_{xy}}$ ($5y = 9x - 22$, $20x = 9y + 350$ gives $r = 0.9$).
- Given $\text{Var}(x)$ and both lines, find S_y from $b_{yx} = rS_y/S_x$.

- Substitute a known mean: if $2x + 3y + 2 = 0$ is x on y and $\bar{y} = -2$, then $\bar{x} = 2$; also plain prediction $\hat{Y} = \text{intercept} + \text{slope}X$.

MTP 2024-Aug S2 [94] · Pg 1084	COMPUTE 75 sec	Easy
PYQ 2026-Jan [42] · Pg 1085	COMPUTE 75 sec	Easy
PYQ 2026-May [49] · Pg 1087	COMPUTE 75 sec	Easy
PYQ 2026-May [100] · Pg 1087	COMPUTE 75 sec	Easy
MTP 2024-Jun S3 [68] · Pg 1083	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [93] · Pg 1084 asked 2×	COMPUTE 75 sec	Medium
PYQ 2025-May [95] · Pg 1084	COMPUTE 75 sec	Medium
PYQ 2026-Jan [43] · Pg 1085	COMPUTE 75 sec	Medium
MTP 2024-Aug S2 [92] · Pg 1083 asked 2×	COMPUTE 75 sec	Hard

Topic 5: Review of Correlation and Regression analysis

P3-C17-U17-T05

Read first Read the review portion of SM 17.4 and the chapter summary: coefficient of determination and non-determination, probable error, and the invariance properties of regression coefficients.

RECALL 30 sec know it or move on · 2 questions Remembering · Level I

- Coefficient of determination $r^2 = \text{explained variance} / \text{total variance}$; coefficient of non-determination = $1 - r^2 = \text{unexplained variance} / \text{total variance}$.
- Regression coefficients are independent of change of origin but NOT of scale.

PYQ 2018-May [69] · Pg 1088	RECALL 30 sec	Easy
PYQ 2018-Nov [84] · Pg 1088	RECALL 30 sec	Easy

COMPUTE 75 sec one formula, straight through · 2 questions Application · Level II

- Compute $1 - r^2$ quickly ($r = 0.6$ gives 0.36 determination, 0.64 non-determination).
- Probable error: $PE = 0.6745(1 - r^2)/\sqrt{n}$; limits for population correlation = $r \pm PE$.
- $b_{xy} = rS_x/S_y$: with $\text{Var}(X) = 5\text{Var}(Y)$, $S_x/S_y = \sqrt{5}$, so $b_{xy} = 0.2\sqrt{5}$.

PYQ 2019-Jun [81] · Pg 1088

COMPUTE
75 sec**Medium**

PYQ 2025-Jan [18] · Pg 1089

COMPUTE
75 sec**Medium**

CHAPTER 18

Index Numbers

7 Topics · 117 Classified Questions · Importance: B

WHAT THIS CHAPTER ASKS FOR mostly **RECALL** · 52 sec a question on average — **faster than the paper**

RECALL Remembering	49.4%	30 sec	44 of 89 past-exam questions
RECOGNISE Understanding	6.7%	45 sec	6 of 89 past-exam questions
COMPUTE Application	42.7%	75 sec	38 of 89 past-exam questions
SET UP Analysis	1.1%	150 sec	1 of 89 past-exam questions

Topic 1: Introduction

P3-C18-U18-T01

Read first Read SM 18.1: what an index number is (a relative measure showing percentage change over a base of 100), price/quantity/value relatives, and how to interpret a given index value.

RECALL 30 sec know it or move on · 1 question Remembering · Level I

- An index number is a series of numerical figures which shows the RELATIVE position (percentage change) of a variable compared with a base period taken as 100.
- Price relative = $(P_n/P_0) \times 100$; index numbers are expressed as percentages.

PYQ 2018-May [76] · Pg 1094

RECALL
30 sec**Easy****RECOGNISE 45 sec** decide which idea applies — no question in this edition Understanding · Level I

- Interpretation: an index of 280 with a given base means prices rose on average by 180% (index minus 100), not 280%.
- Similarly index 355 means a 255% average increase; always subtract the base 100 before quoting the percentage rise.
- An index of 250 means prices are 2.5 times the base level.

COMPUTE 75 sec one formula, straight through · 2 questions Application · Level II

- Use $F^2 = L \times P$: given $L = 110$ and $F = 109$, Paasche = $109^2/110 = 108$.
- Cost of living / Laspeyres-type ratio: $(\sum p_1q_0 / \sum p_0q_0) \times 100$, e.g. $178.6/160.7 \times 100 = 111.14$.

PYQ 2020-Nov [84] · Pg 1094

COMPUTE
75 sec**Easy**

PYQ 2025-Sep [97] · Pg 1095

COMPUTE
75 sec**Easy**

Topic 2: Issues Involved

P3-C18-U18-T02

Read first Read SM 18.2 (issues in construction: selection of data, base period, weights, average, formula) together with the uses and limitations of index numbers in SM 18.5.

RECALL 30 sec memorise · 3 questions Remembering · Level I

MTP 2024-Jun S3 [61] · Pg 1096

RECALL
30 sec**Easy**

MTP 2024-Jun S3 [63] · Pg 1096 asked 2×

RECALL
30 sec**Easy**

MTP 2024-Jun S3 [89] · Pg 1096

RECALL
30 sec**Easy**

RECOGNISE 45 sec decide which idea applies · 2 questions Understanding · Level I

- Know the USES: framing economic/business policies, revealing trends, forecasting future economic activity, deflating nominal values.
- Index numbers are NOT helpful in identifying/detecting errors - the standard 'not a use' distractor.
- Base period should be normal (stable), relatively recent; weights reflect relative importance of items.

PYQ 2021-Dec [98] · Pg 1095 asked 2×

RECOGNISE
45 sec**Easy**

MTP 2025-Jan S2 [100] · Pg 1097 asked 2×

RECOGNISE
45 sec**Easy**

COMPUTE 75 sec work the problem · 5 questions Application · Level II

MTP 2024-Aug S2 [98] · Pg 1096

COMPUTE
75 sec**Easy**

MTP 2024-Aug S2 [100] · Pg 1097

COMPUTE
75 sec**Easy**

MTP 2024-Dec S1 [98] · Pg 1097 asked 2×

COMPUTE
75 sec**Easy**

MTP 2024-Dec S1 [100] · Pg 1097

COMPUTE
75 sec**Easy**

MTP 2024-Aug S2 [99] · Pg 1096

COMPUTE
75 sec**Medium**

Topic 3: Construction of Index Number

P3-C18-U18-T03

Read first Master SM 18.4 (Methods): simple aggregative and relative methods, weighted indices (Laspeyres, Paasche, Marshall-Edgeworth, Fisher), chain index and the cost of living index.

RECALL 30 sec know it or move on · 21 questions Remembering · Level I

- Laspeyres = $(\text{Sum } p_1q_0 / \text{Sum } p_0q_0) \times 100$, base-year quantity weights; Paasche = $(\text{Sum } p_1q_1 / \text{Sum } p_0q_1) \times 100$, current-year weights; Marshall-Edgeworth uses $q_0 + q_n$.
- Fisher's ideal index $F = \sqrt{L \times P}$ (GM of the two); $F^2 = LP$; satisfies both time and factor reversal tests.
- Price relative = $(P_n/P_0) \times 100$; value index = $\text{Sum}(p_nq_n) / \text{Sum}(p_0q_0)$; chain index = $(\text{link relative} \times \text{previous chain index}) / 100$; $P_01 = \text{index for 1 on 0}$.
- CPI/cost of living: retail prices, always a weighted PRICE index; current-year value weights in average of relatives = Paasche.

PYQ 2018-May [78] · Pg 1098	RECALL 30 sec	Easy
PYQ 2018-May [81] · Pg 1098	RECALL 30 sec	Easy
PYQ 2019-Jun [85] · Pg 1100	RECALL 30 sec	Easy
PYQ 2021-Jan [84] · Pg 1101	RECALL 30 sec	Easy
PYQ 2021-Dec [96] · Pg 1104 asked 2x	RECALL 30 sec	Easy
PYQ 2022-Jun [94] · Pg 1105	RECALL 30 sec	Easy
PYQ 2022-Jun [97] · Pg 1105	RECALL 30 sec	Easy
PYQ 2022-Jun [98] · Pg 1105	RECALL 30 sec	Easy
PYQ 2022-Dec [95] · Pg 1106 asked 2x	RECALL 30 sec	Easy
PYQ 2023-Jun [96] · Pg 1108	RECALL 30 sec	Easy
PYQ 2023-Dec [94] · Pg 1109	RECALL 30 sec	Easy
PYQ 2024-Jun [96] · Pg 1110	RECALL 30 sec	Easy
MTP 2024-Jun S3 [90] · Pg 1111	RECALL 30 sec	Easy
PYQ 2024-Sep [26] · Pg 1112	RECALL 30 sec	Easy

PYQ 2025-Jan [16] · Pg 1112	RECALL 30 sec	Easy
PYQ 2025-May [100] · Pg 1114	RECALL 30 sec	Easy
PYQ 2025-Sep [98] · Pg 1115	RECALL 30 sec	Easy
MTP 2025-Jan S2 [96] · Pg 1116 asked 2×	RECALL 30 sec	Easy
PYQ 2026-Jan [48] · Pg 1117	RECALL 30 sec	Easy
PYQ 2026-Jan [47] · Pg 1117	RECALL 30 sec	Easy
PYQ 2026-May [51] · Pg 1120	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 5 questions Understanding · Level I

- If all prices (or quantities) change in the same ratio, Laspeyres = Paasche; Fisher is the geometric, not arithmetic, mean of L and P.
- Index 250 means prices are 2.5 times the base - a 150% increase.

PYQ 2021-Jan [86] · Pg 1101	RECOGNISE 45 sec	Easy
PYQ 2023-Jun [97] · Pg 1108	RECOGNISE 45 sec	Easy
MTP 2024-Jun S3 [62] · Pg 1110	RECOGNISE 45 sec	Easy
MTP 2024-Aug S2 [97] · Pg 1111	RECOGNISE 45 sec	Easy
PYQ 2018-Nov [86] · Pg 1099	RECOGNISE 45 sec	Medium

COMPUTE 75 sec one formula, straight through · 35 questions Application · Level II

- Compute L, P, F, M-E from tables via $\sum p_0q_0$, p_1q_0 , p_0q_1 , p_1q_1 ; use $F^2 = LP$ for the missing one of L, P, F.
- Base shifting: index 1970 on 1960 = $(200 \times 150)/100 = 300$; reversed-base relative: $25/30 \times 100 = 83.33$.
- $DA = \text{salary} \times (CPI - 100)/100$; real wage = nominal $\times 100/CPI$; purchasing power of Re 1 = $100/\text{index}$; required salary = old $\times \text{new CPI}/\text{old CPI}$.
- Base prices double the current ones means each $p_1/p_0 = 1/2$, so Fisher = 50.

PYQ 2018-May [80] · Pg 1098 asked 2×	COMPUTE 75 sec	Easy
PYQ 2018-May [83] · Pg 1099	COMPUTE 75 sec	Easy
PYQ 2018-Nov [87] · Pg 1099	COMPUTE	Easy

	75 sec	
PYQ 2018-Nov [88] · Pg 1100	COMPUTE 75 sec	Easy
PYQ 2022-Dec [94] · Pg 1106	COMPUTE 75 sec	Easy
PYQ 2022-Dec [97] · Pg 1106	COMPUTE 75 sec	Easy
PYQ 2023-Jun [95] · Pg 1107	COMPUTE 75 sec	Easy
PYQ 2023-Jun [98] · Pg 1108	COMPUTE 75 sec	Easy
PYQ 2023-Dec [93] · Pg 1109	COMPUTE 75 sec	Easy
PYQ 2024-Sep [24] · Pg 1111	COMPUTE 75 sec	Easy
PYQ 2025-Jan [22] · Pg 1113	COMPUTE 75 sec	Easy
PYQ 2025-May [97] · Pg 1114 asked 2×	COMPUTE 75 sec	Easy
PYQ 2025-May [99] · Pg 1115	COMPUTE 75 sec	Easy
PYQ 2025-Sep [100] · Pg 1116	COMPUTE 75 sec	Easy
MTP 2025-Jan S2 [99] · Pg 1116 asked 2×	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [96] · Pg 1118	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [98] · Pg 1118	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [99] · Pg 1118	COMPUTE 75 sec	Easy
MTP 2026-Apr S1 [100] · Pg 1118	COMPUTE 75 sec	Easy
MTP 2026-Apr S2 [97] · Pg 1119	COMPUTE 75 sec	Easy
MTP 2026-Apr S2 [98] · Pg 1119	COMPUTE 75 sec	Easy
MTP 2026-Apr S2 [100] · Pg 1119	COMPUTE 75 sec	Easy
PYQ 2026-Sep [27] · Pg 1121	COMPUTE 75 sec	Easy
PYQ 2026-Sep [28] · Pg 1121	COMPUTE 75 sec	Easy
PYQ 2026-Sep [51] · Pg 1121	COMPUTE 75 sec	Easy
PYQ 2019-Jun [87] · Pg 1100	COMPUTE	Medium

	75 sec	
PYQ 2021-Jul [90] · Pg 1101	COMPUTE 75 sec	Medium
PYQ 2021-Jul [89] · Pg 1102	COMPUTE 75 sec	Medium
PYQ 2021-Jul [91] · Pg 1103	COMPUTE 75 sec	Medium
PYQ 2021-Dec [97] · Pg 1104	COMPUTE 75 sec	Medium
PYQ 2023-Dec [96] · Pg 1109	COMPUTE 75 sec	Medium
PYQ 2024-Jun [99] · Pg 1110	COMPUTE 75 sec	Medium
PYQ 2025-Sep [99] · Pg 1115	COMPUTE 75 sec	Medium
PYQ 2026-May [52] · Pg 1119	COMPUTE 75 sec	Medium
PYQ 2025-May [96] · Pg 1113	COMPUTE 75 sec	Hard

SET UP 150 sec set it up before you compute · 1 question · Analysis · Level II

- Weighted-contribution puzzles: weight x item's rise = overall rise; beverages up 40% lifting cost of living 8% gives weight $8/40 = 20\%$. Set up this equation before computing.

PYQ 2025-Jan [20] · Pg 1112	SET UP 150 sec	Medium
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Topic 4: Usefulness of Index Numbers

P3-C18-U18-T04

Read first Read SM 18.5: areas where index numbers are useful (policy framing, trends, forecasting, deflation, cost of living) and how CPI converts nominal into real values.

RECALL 30 sec know it or move on · 2 questions · Remembering · Level I

- Index numbers are used in both economics and statistics/business: framing policies, revealing trends, forecasting, deflating nominal wages into real wages.

MTP 2024-Dec S1 [99] · Pg 1123	RECALL 30 sec	Easy
MTP 2025-Jan S2 [95] · Pg 1123 asked 2×	RECALL 30 sec	Easy

RECOGNISE 45 sec explain with reasons · 1 question · Understanding · Level I

MTP 2024-Dec S1 [97] · Pg 1122

RECOGNISE
45 sec

Medium

COMPUTE 75 sec one formula, straight through · 2 questions Application · Level II

- Real wage = nominal wage $\times$ 100 / cost of living index (Rs 12,500 at index 250 gives Rs 5,000).
- Real raise: deflate the new salary ($500 \times 110/200 = 275$ vs 330 shows the real change); compare with the old salary to judge gain or loss.

PYQ 2026-May [53] · Pg 1123

COMPUTE
75 sec

Easy

PYQ 2024-Sep [27] · Pg 1122

COMPUTE
75 sec

Medium

Topic 5: Deflating Times Series using Index Numbers

P3-C18-U18-T05

Read first Read SM 18.6: deflating a time series - deflated (real) value formula, real wages via CPI, and purchasing power of money.

RECALL 30 sec know it or move on — no question in this edition Remembering · Level I

- Deflated value = current value / price index of the current year ($\times 100$); equivalently current value $\times P_0/P_n$.
- Purchasing power of money = RECIPROCAL of the price index number.
- Real wage = money wage $\times$ 100 / CPI.

COMPUTE 75 sec one formula, straight through · 1 question Application · Level II

- Additional DA for full compensation = salary $\times$ (new index/old index) - salary, e.g. Rs 800 $\times$ $200/160$ - 800 = Rs 200.
- Rise in real terms: deflate the new salary to base prices ($540 \times 120/180 = 360$, so real increase = $360 - 240 = 120$ -type computation) - always deflate before subtracting.
- Check adequacy of a raise: required salary = old salary $\times$ new CPI/old CPI; compare with actual revised salary.

PYQ 2021-Jul [92] · Pg 1123

COMPUTE
75 sec

Medium

Topic 6: Shifting and Splicing of Index Numbers

P3-C18-U18-T06

Read first Read SM 18.7: shifting the base of an index series and splicing two series with different base years into one continuous series.

RECALL 30 sec know it or move on · 2 questions Remembering · Level I

- Shifted price index = (original price index / price index of the year adopted as new base) x 100; **SPLICING** combines two index series with different bases - used when a new commodity is added or weights/method change.

PYQ 2022-Dec [98] · Pg 1124 asked 2×

RECALL
30 sec**Easy**

MTP 2025-Jan S2 [98] · Pg 1125 asked 2×

RECALL
30 sec**Easy****RECOGNISE 45 sec** decide which idea applies — no question in this edition Understanding · Level I

- Statement checks: Laspeyres uses base-year quantities (Paasche uses current); Fisher does NOT satisfy the circular test; GM (not AM) is theoretically best for averaging relatives - splicing index is the one for adding a new commodity.

COMPUTE 75 sec one formula, straight through · 4 questions Application · Level II

- Shift base: index of 2010 (140, base 2000) on base 2020 (210) = $140/210 \times 100 = 66.67$.
- Chain-base rebasing: divide each index by the new base year's index and multiply by 100.
- DA-compensation with CPI shift: Rs 8,000 x 200/160 - 8,000 = Rs 2,000 additional.

PYQ 2026-May [50] · Pg 1125

COMPUTE
75 sec**Easy**

MTP 2024-Aug S2 [96] · Pg 1124

COMPUTE
75 sec**Medium**

PYQ 2025-May [98] · Pg 1125 asked 2×

COMPUTE
75 sec**Medium**

PYQ 2026-Sep [52] · Pg 1126

COMPUTE
75 sec**Medium**

Topic 7: Test of Adequacy

P3-C18-U18-T07

Read first Memorise SM 18.8: the four tests of adequacy - unit test, time reversal test, factor reversal test, circular test - and exactly which formula satisfies which test.

RECALL 30 sec know it or move on · 25 questions Remembering · Level I

- There are 4 tests of adequacy: Unit, Time Reversal, Factor Reversal and Circular (called tests of consistency); 'square test' or 'price relative test' are fake options.
- Time reversal test: $P01 \times P10 = 1$ (the two indices are reciprocals); satisfied by Fisher, NOT by Laspeyres or Paasche. Unit test is satisfied by all formulae except the simple aggregative.
- Factor reversal test: $P01 \times Q01 = V01 = \text{Sum}(p1q1)/\text{Sum}(p0q0)$; ONLY Fisher satisfies it - satisfying both reversal tests makes Fisher the IDEAL index (GM of L and P; Paasche uses current-year weights).

- Circular test: $P_{ab} \times P_{bc} \times P_{ca} = 1$; an extension of the time reversal test; it tests SHIFTABILITY of the base; not met by Laspeyres, Paasche or Fisher - met by the simple GM of price relatives and the weighted aggregative with fixed weights.

PYQ 2018-May [75] · Pg 1126	RECALL 30 sec	Easy
PYQ 2018-May [79] · Pg 1127 asked 2×	RECALL 30 sec	Easy
PYQ 2018-May [82] · Pg 1127 asked 4×	RECALL 30 sec	Easy
PYQ 2020-Nov [83] · Pg 1128	RECALL 30 sec	Easy
PYQ 2021-Jan [85] · Pg 1128 asked 5×	RECALL 30 sec	Easy
PYQ 2021-Dec [100] · Pg 1129	RECALL 30 sec	Easy
PYQ 2021-Dec [99] · Pg 1129	RECALL 30 sec	Easy
PYQ 2022-Jun [95] · Pg 1129	RECALL 30 sec	Easy
PYQ 2022-Jun [96] · Pg 1129	RECALL 30 sec	Easy
PYQ 2022-Jun [99] · Pg 1130	RECALL 30 sec	Easy
PYQ 2022-Dec [96] · Pg 1130	RECALL 30 sec	Easy
PYQ 2023-Jun [99] · Pg 1130	RECALL 30 sec	Easy
PYQ 2024-Jun [97] · Pg 1131	RECALL 30 sec	Easy
PYQ 2024-Jun [98] · Pg 1131	RECALL 30 sec	Easy
PYQ 2024-Jun [100] · Pg 1131	RECALL 30 sec	Easy
MTP 2024-Aug S2 [95] · Pg 1131	RECALL 30 sec	Easy
PYQ 2024-Sep [25] · Pg 1131	RECALL 30 sec	Easy
PYQ 2024-Sep [28] · Pg 1132	RECALL 30 sec	Easy
PYQ 2025-Sep [96] · Pg 1132	RECALL 30 sec	Easy
PYQ 2026-Jan [46] · Pg 1134	RECALL 30 sec	Easy
PYQ 2026-Jan [100] · Pg 1134	RECALL 30 sec	Easy

PYQ 2026-Jan [98] · Pg 1134	RECALL 30 sec	Easy
MTP 2026-Apr S1 [97] · Pg 1135	RECALL 30 sec	Easy
PYQ 2026-May [98] · Pg 1135	RECALL 30 sec	Easy
PYQ 2026-Sep [26] · Pg 1135	RECALL 30 sec	Easy

RECOGNISE 45 sec decide which idea applies · 2 questions Understanding · Level I

- Interpretation carry-over: index 225 with base 2004 means a 125% increase in prices.

PYQ 2019-Nov [88] · Pg 1128	RECOGNISE 45 sec	Easy
PYQ 2025-Jan [21] · Pg 1132	RECOGNISE 45 sec	Easy

COMPUTE 75 sec one formula, straight through · 3 questions Application · Level II

- Fisher = $\sqrt{L \times P}$, e.g. $\sqrt{110 \times 108} = 108.99$.
- Laspeyres from a p_0, p_1, q_0, q_1 table: $(\text{Sum } p_1q_0 / \text{Sum } p_0q_0) \times 100$.

PYQ 2023-Dec [95] · Pg 1130	COMPUTE 75 sec	Easy
PYQ 2025-Jan [23] · Pg 1134	COMPUTE 75 sec	Easy
PYQ 2019-Jun [86] · Pg 1127	COMPUTE 75 sec	Medium