P14 Strategic Financial Management · Paper Map Dec'26

What the paper is, what each module carries, where the Dec'26 questions are expected, and the order of these notes (exam weight). Marks are from the 7 past papers (Jun'23 → Jun'26), out of the **128 printed marks**. **A prediction, not a promise.**

THE PAPER

- **Q1: 15 MCQs × 2 = 30, compulsory** — about 18 of the 30 are small sums; since Dec'25 they go module by module in syllabus order.
- **Q2–Q7: six questions of 7 + 7 marks, all sums. Q8: three short notes (5 + 5 + 4).** Answer any 5 of Q2–Q8 (you write 100 of 128).
- **80% of past marks are sums** — the most templated numbers paper: since Dec'23 every Q2–Q7 half has asked the same *type* of sum; only numbers and one twist change.
- 91% of Jun'26 marks were on a sum type asked before. The exam also copies **SM illustrations** with new numbers — the worked pattern in each module is that illustration.

HOW THESE NOTES WORK

- Each module: **formula sheet with "when to use"** → **solving steps / answer layout** → **one worked pattern** from the SM illustration the exam copies (recomputed by a script) → **practise these** (pointers only: past refs, SM illustration numbers, ICMAI Practice Workbook problems, MQP / PTP / postal, MCQ bank) → traps and the theory the sum needs.
- **P14 has no supplementary**; the SM's rates and methods apply. Anything taken from outside the SM carries a ⚠.
- "SM 505" = printed page of the ICMAI study material. "WB Ch13 illus. 4" = ICMAI Practice Workbook (Paper 14) chapter and problem.

Modules: what they cover and what they carried

#	Module (SM pages) · what it covers	J23	D23	J24	D24	J25	D25	J26	Exp D26	Priority
M13	**Financial derivatives** (479–600): index-futures hedging (Q6(a)), options — binomial, put-call parity, strategies (Q6(b)), swaps, FRA / caps / floors	16	20	22	20	18	18	18	**17.9**	★★★
M6	**Equity and bond valuation** (201–228): multi-stage DDM (Q3(b)), bond value / YTM / duration / convertibles (Q4(a))	8	16	16	16	18	16	16	**16.0**	★★★
M15	**Foreign exchange market** (635–670): quotes, cross rates, arbitrage, forward premium, IRP / PPP / Fisher (Q7(a))	2	9	2	9	9	11	11	**11.0**	★★★
M2	**Risky investment proposals** (69–102): CE, RADR, ENPV / SD / CV, decision tree, sensitivity, scenario, simulation (Q3(a))	12	7	11	7	7	11	11	**10.3**	★★★
M1	**Investment decisions** (6–59): incremental cash flows, replacement NPV, PI, MNPV / MIRR, EAC, inflation, capital rationing (Q2(a))	28	11	7	9	9	9	9	**9.0**	★★★
M9	**Asset pricing** (383–406): beta, CAPM, APT, levered / unlevered beta (Q5(a))	8	4	9	7	9	9	11	**7.9**	★★★
M17	**Digital finance** (717–735): stablecoins, CBDC, neo-banks, digital infrastructure, finance cube (Q8(a) note)	8	9	9	9	7	7	7	**7.2**	★★★
M3	**Leasing** (111–134): lease vs buy, lessor's break-even / structured rentals (Q2(b))	–	7	7	7	7	7	7	**7.0**	★★★
M8	**Portfolio theory** (299–359): two-asset risk, Sharpe single-index vs Markowitz, utility / risk penalty (Q5(b))	8	9	9	9	11	2	7	**6.9**	★★
M16	**Forex risk management** (685–707): forward vs money market vs option hedge (Q7(b))	16	7	14	7	7	7	7	**6.6**	★★★
M14	**International financial environment** (617–629): GDR / ADR / foreign bonds, World Bank / IMF (Q8(b) note)	–	5	5	5	5	7	7	**6.5**	★★
M10	**Portfolio performance** (419–436): Sharpe, Treynor, Jensen rankings	8	7	7	4	4	7	7	**6.4**	★★★

M4	**Securitisation** (147–155): features, parties, mechanism, limitations, SPV securities (Q8(c) note)	6	4	6	4	4	6	6	**5.6**	★★
M7	**Mutual funds** (237–286): NAV with loads / dividends, investor return (Q4(b), December)	10	9	2	9	7	7	–	**5.1**	★★
M5	Security analysis (163–190): technical indicators (RSI, stochastic, moving averages) — MCQ (v)	–	2	–	4	4	2	2	2.5	★
M12 · M11	Risks in financial markets (465–473) — MCQ (ix) · Efficient market hypothesis (445–455) — MCQ facts	2	2	2	2	2	2	2	2.1	★

Exp D26 = expected marks in the Dec'26 printed paper (workbook "Marks by Topic", from the slot model). Printed order of these notes = this table's order.

Where the Dec'26 questions are expected (the template since Dec'23)

Q	(a) 7 marks	(b) 7 marks	Notes pack
Q2	**NPV sum** (6 of 6) — every December a **replacement** (tax on old asset, depreciation shield, working capital, salvage, subsidy)	**Leasing** (6 of 6): lessor's rental (4 of last 5) or **lease vs buy** (D23, D24 — due)	M1 · M3
Q3	**Risk analysis**: ENPV / SD / CV (last 3), decision tree (MQP), scenario, simulation	**Multi-stage DDM** (6 of 6), g = ROE × retention, P/E check	M2 · M6
Q4	**Bond** (6 of 6): value v price, duration, convertible (due)	**Fund NAV** (every December) or Sharpe / Treynor ranking	M6 · M7 · M10
Q5	**CAPM / beta**: beta from covariance, under / over-valued, levered beta, alpha	**Portfolio risk** (single-index v Markowitz) or performance ranking	M9 · M8 · M10
Q6	**Index-futures hedge** (6 of 6) — the December template D23 = D24 = D25	**Options** (binomial, parity, strategies) or swap / FRA / cap	M13
Q7	Cross rates, triangular arbitrage, IRP / PPP — or a hedge	**Forward v money market v option** (every paper)	M15 · M16
Q8	(a) Digital finance note 5 · (b) GDR / ADR / foreign bonds or World Bank / IMF 5 · (c) securitisation list 4		M17 · M14 · M4

Q1 · THE 15 MCQ POSITIONS (SYLLABUS ORDER, D25 = J26)

i. Capital budgeting: MNPV / MIRR, PI, APV (M1)
ii. Sensitivity analysis (M2)
iii. Certainty equivalent / ENPV (M2)
iv. Securitisation (M4)
v. Technical analysis: RSI, stochastic (M5)
vi. Bond value (M6)
vii. CAPM or utility / CML (M9 / M8)
viii. Levered / unlevered beta (M9)
ix. Types of risk (M12)
x. Options: Greeks, payoffs (M13)
xi. Options / futures / FRA (M13)
xii. GDR / ADR / foreign bonds (M14)
xiii. Exchange rates / arbitrage (M15)
xiv. Parity: IRP / PPP / Fisher (M15)
xv. Digital finance (M17)

YOUR 5 OF 7 (ANALYSIS §5)

- **Core: Q2, Q3, Q4, Q6, Q7** — 70 marks of repeatable sums. Start with Q6 (derivatives, the biggest module), then Q4 (bond + fund).
- **Spare 1: Q5** — CAPM / beta / portfolio; the sub-type rotates most.
- **Spare 2: Q8** — notes that repeat almost word for word (GDR features, SPV securities, stablecoin variants each came twice).
- On the day, drop the two questions whose **twist** you are least sure of.

STUDY ORDER (FIRST 11 ROWS ≈ 57% OF THE PAPER)

1. 6.2 Bond valuation
2. 6.1 Equity valuation (DDM)
3. 13.2 Index-futures hedging
4. 13.3 Options
5. 1.1 NPV / replacement
6. 16.1 Transaction-exposure hedging
7. 10.1 Sharpe / Treynor / Jensen
8. 17.2 Digital finance ecosystem
9. 2.1 Risk analysis (ENPV / SD / CV)
10. 9.1 CAPM and APT
11. 8.1 Portfolio return and risk

Then 15.2 cross rates, 14.2 GDR / ADR, 3.2 lessor's rental, 7.3 NAV, 15.3 arbitrage (first 16 ≈ 72%).

⚠ WHAT COULD GO WRONG (ANALYSIS §7)

- **A new twist inside a familiar sum** (a subsidy, a trade-in, a callable bond, joint probabilities): practise two or three variants of each slot, not one model answer.
- **The June template in December** — know both versions of Q2(a) (new project), Q4(b) (investor return / Sharpe–Treynor) and Q6(a) (cut beta by selling shares for risk-free securities or by futures).
- **Q6(b) moves to interest-rate derivatives**: FRAs and caps have never been examined but sit in the MQP, PTP and postal paper.

Formula card — the sums, the formula, when to use it

Every formula is checked against its SM page; the module notes give the steps and the worked pattern. ⚠ = not in the SM (from ICMAI's workbook / answers).

Q · when	Formula
Q2(a) NPV	CFAT = EBIT (1 − t) + depreciation; PI = PV of inflows ÷ outlay [SM 8, SM 18]
MCQ (i)	MIRR = (FV of inflows ÷ PV of outflows)$^{1/n}$ − 1; MNPV = terminal value × PVIF − outlay; EAC = NPV ÷ PVIFA [SM 25–27, SM 30]
Q2(b) leasing	Rate = $k_d(1 - t)$; lessee BELR: rental (1 − t) PVIFA = PV of buying; lessor BELR = cost − PV dep. shield − PV salvage [SM 113, SM 115]
Q3(a) risk	E(CF) = Σ P × CF; SD = √Σ P (CF − mean)^2; CV = SD ÷ ENPV; CE: α × CF at the risk-free rate [SM 70–71, SM 75]
MCQ (ii)	Sensitivity = change that makes NPV = 0 ÷ estimate [SM 84]
Q3(b) DDM	$P_0 = \Sigma D_t \div (1 + k)^t + [D_{n+1} \div (k - g)] \div (1 + k)^n$; g = b × ROE; k = $D_1 \div P_0$ + g [SM 204, SM 209]
Q4(a) bond	P = C × PVIFA + RV × PVIF; YTM ≈ [C + (M − P) ÷ n] ÷ (0.4M + 0.6P) [SM 213, SM 217]
Q4(a) ⚠	Duration = Σ t × PV ÷ price; volatility = duration ÷ (1 + YTM); convertible: conversion value = ratio × share price (WB Ch4)
Q4(b) NAV	NAV per unit = net assets ÷ units; return = (ΔNAV + distributions) ÷ opening NAV [SM 254–255]

Q · when	Formula
Q5(a) CAPM	$E(R) = R_F + \beta(R_M - R_F)$; $\beta_L = \beta_U[1 + (1 - t) D/E]$ [SM 384, SM 390]
Q5(b) portfolio	$\sigma_p^2 = W_1^2\sigma_1^2 + W_2^2\sigma_2^2 + 2W_1W_2Cov$; residual = total − $\beta^2\sigma_M^2$ [SM 301, SM 351]
Q4(b) / Q5	Sharpe = $(R - R_f) \div \sigma$; Treynor = $(R - R_f) \div \beta$; Jensen α = $R - [R_f + \beta(R_m - R_f)]$ [SM 425, SM 428]
MCQ (vii)	Risk penalty = risk^2 ÷ risk tolerance; utility = E(R) − penalty [SM 320]
Q6(a) futures	$F = S e^{rt}$ (dividend yield: $S e^{(r-y)t}$); contracts = V × (β* − β) ÷ (index × lot) [SM 493, SM 505]
Q6(b) options	$C + X e^{-rt} = P + S$; $\Delta = (C_u - C_d) \div (S_u - S_d)$; p = (f − d) ÷ (u − d) [SM 539, SM 541, SM 563]
Q7(a) forex	Cross: bid × bid, ask × ask; premium p.a. = (F − S) ÷ S × 12 ÷ months [SM 645–646]
Q7 / MCQ (xiv)	PPP $e_0(1 + i_h) \div (1 + i_f)$; IRP $e_0(1 + r_h) \div (1 + r_f)$; Fisher (1 + n) = (1 + r)(1 + i) [SM 662, SM 665, SM 668]
Q7(b) hedge	Forward / money market (invest for a payable, borrow for a receivable) / option (premium + min(spot, strike)) [SM 688–690]

Module 13 · Financial derivatives P14 · 13.1–13.5

SM pp. 479–600 (exercise 601–616). **The biggest module: 16–22 marks every paper** (expected 17.9). **Q6(a) index-futures hedge in all 6 papers** since Dec'23; **Q6(b) options in 5 of 6** (binomial three times), a swap in Jun'26; **MCQs (x) and (xi)** on options / Greeks every paper. FRA and caps never examined but in the MQP, PTP and postal paper.

Paper	Q6(a) futures	Q6(b) options / swap
Jun'23	beta, risk-free route, Nifty contracts, beta after a 4% rise	binomial hedge, call value, expected return
Dec'23	**5-share portfolio: beta, Feb futures fair value, full hedge, cut beta to 0.6**	**binomial (delta) call, put by parity, expected values**
Jun'24	cut beta to 0.91: risk-free securities or futures	call by binomial and risk-neutral methods
Dec'24	= Dec'23 template (beta to 0.5)	long call + long put (strangle) at 3 prices
Jun'25	= Jun'24 template (beta to 0.975)	call from a price distribution
Dec'25	**= Dec'23 template, same rates; one beta missing**	**= Dec'23 template, same e-factors**
Jun'26	contracts with an adjusted beta; P/L both ways	**interest rate swap = SM exercise sum 9 word for word**

HOW IT IS ASKED

- **December Q6(a)**: same table of 5 shares (price × number × beta), cost of capital 10.5% (ln 1.105 = 0.0998 given), Nifty Feb futures at fair value, lot 100 / 200. Four parts — learn the four steps.
- **June Q6(a)**: reduce beta by selling shares and buying risk-free securities, or by selling futures (the risk-free route is in Module 9).
- **Q6(b)**: two-price binomial with the delta method, put by parity, expected values — all e-factors given. Or a strategy table at several prices, or a swap.
- **MCQs**: Greeks (rho of a put, theta per day, vega), straddle, LEAPS, baskets, covered call, bull call spread, contracts to hedge.

A Formula sheet — when to use

Formula	When to use · notes	SM
$\mathbf{F^* = S_0\, e^{rt}}$	Fair (theoretical) futures / forward price; no income. r continuously compounded p.a., t in years. Index futures use the same model.	[SM 490, SM 493]
$\mathbf{F^* = (S_0 - I)\, e^{rt}}$	Known cash dividend: I = PV of the dividend at e^{-rt}.	[SM 491]
$\mathbf{F^* = S_0\, e^{(r-y)t}}$	Known dividend **yield** y (index with continuous dividends).	[SM 492–493]
TFP > actual → buy spot, sell futures; TFP < actual → sell spot, buy futures	Cash-and-carry / reverse arbitrage; value of a long forward f = (F* − K) e^{-rt}.	[SM 490, SM 492]
Portfolio beta = Σ (value weight × beta)	Value = price × number of shares; step 1 of every Q6(a).	[SM 511]
$\mathbf{Contracts = V_P \times (\beta_N - \beta_E) \div V_F}$	Change beta: negative / falling → **sell** futures; rising → **buy**. V_F = index × lot. Full hedge: $\beta_N = 0$, i.e. $V_P \times \beta \div V_F$.	[SM 505, SM 511]
Hedge ratio = $\rho_{SF} \times \sigma_S \div \sigma_F$	Cross hedge (no futures on the stock): contracts = hedge ratio × units to hedge ÷ units per contract.	[SM 506]
Call BEP = X + C · Put BEP = X − P	Pay-off tables at several spot prices; buyer's loss limited to the premium.	[SM 519–520]
Intrinsic value: call max(S − X, 0), put max(X − S, 0); time value = premium − IV	ITM / ATM / OTM questions; Illus. 47 table.	[SM 524, SM 550]
$\mathbf{C + X\, e^{-rt} = P + S}$	Put-call parity, European only: P = C + X e^{-rt} − S.	[SM 539]

$\Delta = (C_u - C_d) \div (S_u - S_d)$; C = Δ × ($S_0$ − PV of the lower price)	Binomial, **delta method** (the December Q6(b)), when $C_d = 0$.	[SM 563]
$p = (f - d) \div (u - d)$, $f = e^{rt}$; C = $[C_u\, p + C_d(1 - p)] \div f$	Binomial, risk-neutral method; $u = S_u/S_0$, $d = S_d/S_0$; two-stage: work back node by node.	[SM 541–542]
$C = S\, N(d_1) - X\, e^{-rt}\, N(d_2)$; $d_2 = d_1 - \sigma\sqrt{t}$	Black-Scholes (N values are given in the question).	[SM 543]
Swap gain = |fixed diff − floating diff| − commission	Quality spread; strong party borrows where its advantage is bigger and swaps.	[SM 580]
FRA payoff = N × (ref − fixed) × α ÷ (1 + ref × α)	Settled at the start of the period, so discounted; α = days ÷ 360.	[SM 586]

B Index-futures hedging · Q6(a) 13.2

- **Forward**: private, customised, settled at maturity. **Futures**: exchange-traded, standardised, **marked to market** daily — re-priced at the settlement price, gains and losses settled each day. [SM 487]
- **Basis** = futures price − spot price. [SM 487]
- **Initial margin** deposited to open; **maintenance margin** the minimum balance; a call brings it back to the initial level = **variation margin**. [SM 488]
- **Hedge with stocks held**: equal and opposite futures position; a 100% hedge with beta 1.5 makes a 10% market fall net nil. [SM 503]
- **Money in the account** (stocks not yet chosen) → **buy** index futures to ride a rally. [SM 503–504]
- **Modify systematic risk**: V × original β ± futures position = V × desired β. Selling futures reduces beta. [SM 504]
- Cross hedge carries **basis risk**; choose the index with the highest correlation, then the beta nearer 1. [SM 506, SM 510]

1 · Portfolio beta
value = price × shares; β = Σ value × β ÷ Σ value (back-solve a missing beta)

↓

2 · Fair value of the futures
r = ln(1 + rate); $F = S\, e^{rt}$, t = days ÷ 365

↓

3 · Full hedge
contracts to SELL = V × β ÷ (F × lot)

↓

4 · Change beta
V × (β − β*) ÷ (F × lot): sell to cut, buy to raise; round to whole contracts

The answer layout ICMAI uses: a table Security · Price · Shares · Value · Beta · Value × Beta, then one line per part.

PROBLEMS BOX · INDEX-FUTURES HEDGE (Q6(a) — RECOMPUTED BY SCRIPT m13_patterns.py)

WORKED PATTERN · SM ILLUSTRATION 19 (STOCK INDEX FUTURES)

Stock	Value ₹ lakh	Beta	Weighted
1 · 2 lakh × ₹800	1,600	1.1	0.34
2 · 4 lakh × ₹600	2,400	1.2	0.55
3 · 6 lakh × ₹200	1,200	1.3	0.30
Portfolio	**5,200**		**1.19**

- One contract = spot 2700 × 100 = ₹2,70,000.
- Cut beta to 0.8: **sell** 5,200 lakh × (1.19 − 0.8) ÷ ₹2,70,000 = **751 contracts**.
- Raise beta to 1.5: **buy** 5,200 lakh × (1.50 − 1.19) ÷ ₹2,70,000 = **597 contracts**. [SM 510–511]
- Illus. 15: ₹100 crore, β 1.2 → 0.8, futures 5500 × 100: (0.8 − 1.2) × 100 crores ÷ 550000 = **−727** (sell). [SM 504–505]

FAIR VALUE — SM ILLUSTRATIONS 3–5

- Illus. 4: dividend ₹1.50 in 4 months, r 10%: I = 1.4508; F = (38 − 1.4508) × $e^{0.10 \times 6/12}$ = **₹38.4231**. Illus. 5: 25 × $e^{(0.10 - 0.04) \times 6/12}$ = **₹25.76**. [SM 491–492]

DEC'23 Q6(a) DEVAL — THE DECEMBER TEMPLATE (OUR WORKING)

- Values: A 17,46,500 · B 33,63,500 · C 47,48,160 · D 73,47,000 · E 16,49,700 = **₹1,88,54,860**; Σ value × β = ₹1,60,09,114 → **β = 0.8491**.
- r = ln(1.105) = 0.0998; 1 Jan → end Feb = 58 days: 0.0998 × 58/365 = 0.015858 → F = 5900 × 1.01598 = **5,994.28**.
- Full hedge: 1,60,09,114 ÷ (5,994.28 × 200) = 13.35 → **sell 13 contracts**.
- Beta to 0.6: 1,88,54,860 × (0.8491 − 0.6) ÷ 11,98,856 = 3.92 → **sell 4 contracts**.

DEC'25 Q6(a) HICKS — THE TWIST (OUR WORKING)

- Portfolio β 0.859 given, β of BZ missing: (0.859 × 1,63,29,800 − Σ known value × β) ÷ 16,71,000 = **1.1534**.
- F = 13000 × 1.01598 = **13,207.74**; full hedge 0.859 × 1,63,29,800 ÷ (13,207.74 × 100) = 10.62 → **11**; at β 1.263: 15.62 → **16** (our reading of part (iv)).

PRACTISE THESE (MOST LIKELY FIRST)

D23, D24, D25 Q6(a) (December template) · J24, J25 Q6(a) and J23 Q6(a) (risk-free route) · J26 Q6(a) · MQP Q6(a), Q1(ix) (cross hedge 1.5) · PTP Q6(a), Q1(ix) · postal Q4(b)(i) · SM Illus. 15, 19, 20, 21, 22 (beta matrix), 16–17 (cross

⚠ SM SLIP · ILLUSTRATION 3

The SM writes $70 \times e^{0.06 \times 3/12} = 70 \times 1.0202 = ₹71.41$. $0.06 \times 3/12 = 0.015$ and $e^{0.015} = 1.0151$, so **F* = ₹71.06**; 1.0202 is $e^{0.02}$. [SM 491]

hedge), 3–6, 9–12 (pricing) · SM exercise sums 1–2, MCQs 20, 27, 28 · **ICMAI Practice Workbook Ch8 illus. 8, 9, 11, 12, 13, 14, 16** · MCQ bank Q128, Q131, Q133, Q135, Q136, Q160, Q162, Q165, Q170, Q172.

C Options · Q6(b) and MCQs (x)–(xi) 13.3

Position	Max loss	Max gain	BEP
Long call	premium	unlimited	X + C
Short call	unlimited	premium	X + C
Long put	premium	substantial	X − P
Short put	substantial	premium	X − P

Illus. 25–28: X ₹3,500, premium ₹50 → call BEP **₹3,550**, put BEP **₹3,450**. [SM 520–524]

Strategy	Made of	View
Covered call	long stock + short call	neutral / mildly bullish
Protective put	long stock + long put	insure a holding
Bull call spread	buy lower-strike call + sell higher-strike call	moderately bullish
Bear put spread	buy higher-strike put + sell lower-strike put	moderately bearish
Long straddle	buy call + put, **same** strike and expiry	big move either way
Long strangle	buy OTM put + OTM call; BEPs: call strike + net premium, put strike − net premium	very high volatility
Strap / strip	2 calls + 1 put / 2 puts + 1 call	bullish / bearish on volatility

[SM 528–539]

- **Greeks**: **delta** = change in option price ÷ change in stock price (call positive, put negative; = shares per option for a riskless hedge); **gamma** = rate of change of delta; **vega** = sensitivity to volatility; **theta** = sensitivity to time to expiry (time decay); **rho** = sensitivity to the interest rate. [SM 544–545]
- MCQ facts: value up 1.75 / 1.8 when rates fall 1% = **rho of a put** (J23, D24); theta −0.02 → option loses 0.02 a day (J26); options up to 3 years = **LEAPS** (D25); options on portfolios = **baskets** (J26). (past MCQs)
- **Bounds**: European call max S, min max(0, $S - X e^{-rt}$); American put max X, min max(0, X − S). [SM 525]
- Put-call parity is **not applicable to American options**. [SM 539]
- Black-Scholes assumptions: no dividend, efficient market, no costs or taxes, constant known r, log-normal returns, European exercise. [SM 543]

Binomial · delta method

pay-offs at the two prices: $C_u = S_u - X$, $C_d = 0$

↓

$\Delta = (C_u - C_d) \div (S_u - S_d)$

↓

PV of $S_d = S_d \times e^{-rt}$; $C = \Delta \times (S_0 - PV)$

↓

Put = $C + X e^{-rt} - S_0$; expected values with the given probabilities

PROBLEMS BOX · OPTION VALUE (Q6(b) — RECOMPUTED BY SCRIPT)

WORKED PATTERN · SM ILLUSTRATION 57 (ABC LTD) — THE DELTA METHOD

- S ₹110; in 3 months ₹100 or ₹150; X ₹120; r 12% continuous.
- Pay-offs: lapse at 100 (nil), exercise at 150 (₹30). Option delta = (₹30 − 0) ÷ (₹150 − ₹100) = **0.60**.
- Invest at risk-free = PV of ₹100 = ₹100 ÷ $e^{0.12 \times 0.25}$ = ₹100 ÷ 1.0305 = **₹97.04**.
- Call = 0.60 × (₹110 − ₹97.04) = **₹7.78**; put = ₹7.78 + ₹116.45 − ₹110 = **₹14.23**. [SM 562–563]

RISK-NEUTRAL METHOD · SM ILLUSTRATION 41

S ₹50, ± 20% in 3 months, X ₹50, 8%: f = 1.02, p = (1.02 − 0.80) ÷ (1.2 − 0.8) = 0.55 → call = 10 × 0.55 ÷ 1.02 = **₹5.39**, put = 10 × 0.45 ÷ 1.02 = **₹4.41**. [SM 541]

PARITY · SM ILLUSTRATION 40

DEC'25 Q6(b) HONT — THE DECEMBER TEMPLATE (OUR WORKING)

- S ₹648 → ₹680 (60%) or ₹616 (40%); X ₹640; 6% continuous; 3 months ($e^{-0.015}$ = 0.985112).
- Pay-offs ₹40 / nil → Δ = 40 ÷ 64 = **0.625**; PV of 616 = 616 × 0.985112 = 606.83.
- Call = 0.625 × (648 − 606.83) = **₹25.73**; put = 25.73 + 640 × 0.985112 − 648 = **₹8.20**.
- Expected price in 3 months = 680 × 0.6 + 616 × 0.4 = **₹654.40**; expected option value at expiry = 40 × 0.6 = **₹24**.

PRACTISE THESE (MOST LIKELY FIRST)

D23, D25 Q6(b) (delta + parity) · J24 Q6(b) (both methods) · J23 Q6(b) · J25 Q6(b) · D24 Q6(b) (strangle) · PTP Q6(b), Q8(b), Q1(xi) · MQP Q1(x) · postal Q1(ii) · SM Illus. 57, 58, 41, 42, 40, 23–39 (pay-offs, strategies), 43 (Black-Scholes), 47, 50, 51 (tables) · SM exercise sums 4, 5, 6, 8 (binomial

S ₹500, call ₹12, X ₹550, 3 months, 8%: P = 12 + 539.11 − 500 = **₹51.11**. [SM 540]

₹21.522), 10 (strategy names), MCQs 6–12, 19–26, 29 · **ICMAI Practice Workbook Ch8 illus. 1–7, 10, 15, 17, 18** · MCQ bank Q126, Q127, Q129, Q130, Q134, Q138, Q139, Q163, Q164, Q166–Q169, Q189.

D Swaps, FRA, caps and floors 13.4 · 13.5

Interest rate swap — steps
differences: fixed rates, floating rates → net (quality spread)

↓

less the bank's commission → net gain; split in the given ratio

↓

the party with the bigger edge in fixed borrows **fixed**, the other **floating**; they swap

↓

effective rate = own loan ∓ differential ∓ share of gain (+ commission); check against the direct-borrowing rate

- Plain vanilla swap = fixed for floating (J23 MCQ). Swaps are private agreements (MQP MCQ). (past MCQs)
- **FRA**: forward rate > LIBOR → the buyer pays the difference; forward rate < LIBOR → the seller pays. The principal is notional. [SM 586]
- **Cap** = call options on interest rates (pays when rates rise above the strike); **floor** = put options on rates; **collar** = buy a cap + sell a floor. [SM 593]

PROBLEMS BOX · SWAP / FRA / CAP (RECOMPUTED BY SCRIPT)

WORKED PATTERN · SM ILLUSTRATION 69 (PQR / DEF)

- Floating diff 0.5% · fixed diff 1.4% · net 0.9% − bank 0.5% = 0.4% → 0.2% each.
- PQR borrows fixed 12.0%, collects 11.9% − LIBOR from DEF and 0.2% gain → **LIBOR − 0.1%**. DEF borrows LIBOR + 0.6% and pays the rest. [SM 580–581]

SM EXERCISE SUM 9 = JUN'26 Q6(b) (OUR WORKING)

- X 7.5% / L + 25 bp; Y 8.45% / L + 37 bp; commission 0.2% borne by Y; split 60 : 40.
- 0.95 − 0.12 = 0.83% − 0.20 = **0.63%** → X 0.378%, Y 0.252%.
- X borrows fixed 7.5%, collects 7.25% − L from Y → **L − 0.128%**; Y: L + 0.37 + 7.25 − L + 0.378 + 0.2 = **8.198%** (v 8.45%).
- Savings on US$ 50 million: X **$1,89,000**, Y **$1,26,000** a year.

FRA · SM ILLUSTRATION 71 · CAP · ILLUSTRATION 75

3 × 6 FRA on $3,00,00,000 at 5.5%; settles at 4.875% for 92 days → payoff **$47,326.39** to the seller. [SM 586]

Cap 9% on ₹400 million at 0.65% = ₹26,00,000; rates at 10% → cap pays ₹40,00,000; floors to sell to pay for it: ₹37,68,11,594. [SM 593–594]

PRACTISE THESE

J26 Q6(b) · MQP Q6(b) · postal Q8, Q4(b)(ii), Q5(a), Q5(b) · PTP Q1(x) (cap pay-off) · SM Illus. 65–70, 71–75, solved case 1 · SM exercise sums 3, 7, **9** · **WB Ch8 illus. 19** · MCQ bank Q132, Q140, Q192.

R Revision sheet and traps

Item	Rule	SM
Fair value	$S e^{rt}$; dividend: $(S - I) e^{rt}$; yield: $S e^{(r-y)t}$	[SM 493]
Contracts	$V \times (\beta^* - \beta) \div$ (index × lot)	[SM 505]
Parity	$C + X e^{-rt} = P + S$	[SM 539]
Risk-neutral p	$(f - d) \div (u - d)$, $f = e^{rt}$	[SM 541]
Delta	change in option ÷ change in stock	[SM 544]
BEP	call X + C; put X − P	[SM 519–520]

TRAPS

- Use the **continuous** rate: ln(1 + annual rate) when the question gives ln values — not the simple rate.
- Days: count from the trade date to the expiry month-end as the question says; the e-factor given tells you which count ICMAI used.
- Contracts must be whole: state "sell 13 (13.35)"; say **sell** or **buy**.
- The full hedge uses value × **beta**, not the value alone.
- Delta method needs $C_d = 0$; if both pay off, use the risk-neutral formula.
- Swap: commission borne by one party is added only to that party's cost.

MEMORY HOOK

"Beta, Fair, Full, Fix" — the four steps of every December Q6(a). **"Delta, PV-low, Call, Parity"** — the four of Q6(b).

Module 6 · Equity and bond valuation P14 · 6.1 · 6.2

SM pp. 201–228 (exercise 229–236). **16–18 marks every paper since Dec'23** (expected 16.0): **Q3(b) multi-stage DDM in all 6 papers** and **Q4(a) a bond sum in all 6**, plus MCQs (ii) Gordon and (vi) bond value. The SM has **no duration and no convertible-bond section**, yet the exam asked convertibles four times and duration in Dec'25 — those parts follow ICMAI's Practice Workbook (Ch4) and are marked ⚠.

Paper	Q3(b) DDM	Q4(a) bond
Jun'23	–	convertible: straight value, conversion value / premium, downside risk, parity price
Dec'23	three-stage 18%, 12%, 6%	convertible worked backwards
Jun'24	three-phase (growth falls linearly) = SM Illus. 8	convertible debenture: premium, income differential
Dec'24	two-stage, g from ROE (DuPont), CAPM k	convertible (semi-annual): redemption v conversion
Jun'25	multi-stage backwards: find g	zero-coupon, tiered yields, call / put
Dec'25	**12%, 10%, then g = ROE × b; over / under-valued**	**price, duration, volatility, price after +100 / −75 bp** (= WB Ch4 illus. 10)
Jun'26	two-stage, g = ROE × b; price from P/E	value v market price, premium redemption (= MQP Q4(a))

HOW IT IS ASKED

- **Q3(b)**: dividends grow at given rates for 1–3 years, then at **g = ROE × retention**; PV factors given (one set is a distractor); compare with the market price.
- **Q4(a)**: PVIFA / PVIF given; value v market price; or duration table; or a convertible's five measures.
- **MCQs**: Gordon value (D0 × (1 + g)), price in 3 years, expected return D1/P0 + g, bond price at a market rate, semi-annual bond, issue price with premium redemption.

A Formula sheet — when to use

Formula	When to use · notes	SM
$\mathbf{V_0 = D_0 \div k}$	Zero growth (constant dividend for ever).	[SM 202]
$\mathbf{V_0 = D_1 \div (k - g)}$, $D_1 = D_0(1 + g)$	Constant growth (Gordon). Read "currently pays / just paid" = D_0; "expected / next" = D_1.	[SM 202]
$V = (1 - b)\ E_1 \div (k - g)$	Earnings and payout given; b = retention rate.	[SM 204]
$\mathbf{k = D_1 \div P_0 + g}$	Expected / required return from the price (dividend yield + growth).	[SM 204, SM 206]
$\mathbf{g = b \times ROE}$; $P_0/E_1 = (1 - b) \div [k - (ROE \times b)]$	Sustainable growth for the last stage; P/E from the DDM.	[SM 209]
$\mathbf{P_0 = \Sigma\ D_t \div (1 + k)^t + [D_{n+1} \div (k - g_n)] \times 1 \div (1 + k)^n}$	Multi-stage: PV of the high-growth dividends + PV of the price at the end of the high-growth period.	[SM 204]
$V_0 > P_0$ under-valued (buy / hold); $V_0 < P_0$ over-valued (sell / avoid)	The last line of every Q3(b).	[SM 206]
$\mathbf{P = C \times PVIFA_{r,n} + FV \times PVIF_{r,n}}$	Bond value; FV = redemption value (premium if redeemable at a premium). Semi-annual: C/2, r/2, 2n.	[SM 213–214]
Current yield = annual interest ÷ price	MCQ; ignores the gain or loss to maturity.	[SM 215, SM 218]
YTM ≈ [C + (M − P) ÷ n] ÷ (0.4 M + 0.6 P)	Approximate YTM; exact = trial and error with interpolation. Zero-coupon: $(FV \div P)^{1/n} - 1$.	[SM 217]

⚠ **Duration** = Σ (t × PV of cash flow) ÷ price; **volatility** (modified duration) = duration ÷ (1 + YTM); new price ≈ price × (1 ∓ volatility × change in yield)	Not in the SM — ICMAI Practice Workbook Ch4 illus. 10 and Dec'25 Q4(a).	WB
⚠ **Convertible**: straight value = PV of coupons + redemption at the plain-bond rate; conversion value = ratio × share price; conversion premium = (bond price − conversion value) ÷ conversion value; downside risk = (bond price − straight value) ÷ straight value; parity price = bond price ÷ ratio	Not in the SM (it only defines a convertible bond, SM 211) — ICMAI's answers and WB Ch4 illus. 4.	WB

B Multi-stage DDM · Q3(b) 6.1

1 · Dividends of the high-growth years
$D_1 = D_0(1 + g_1)$, $D_2 = D_1(1 + g_2)$ …

↓

2 · Stable growth
g = ROE × retention (or given); $D_{n+1} = D_n(1 + g)$

↓

3 · Price at the end of year n
$P_n = D_{n+1} \div (k - g)$

↓

4 · Discount
$V_0 = \Sigma D_t \times PVIF + P_n \times PVIF_n$ (use the factors at k)

↓

5 · Compare
V_0 v market price (or P/E × EPS) → under / over-valued

ICMAI layout: table Year · Growth · Dividend · PVIF · PV, then the terminal value line, then the total and the advice.

- The DDM is very **sensitive**: k from 15% to 16% → value ₹154.29 to ₹135 (12.5% fall); g from 8% to 9% → ₹181.67 (17.74% rise). [SM 203]
- Value grows by g each year: V_2 = ₹154.29 × (1.08) = ₹166.63. [SM 202–203]
- **P/E rises** with the payout ratio and with g; falls as k rises. High dividend yield + low P/E = limited growth; low yield + high P/E = growth prospects. [SM 208]
- If k < g, the constant-growth formula is meaningless (Additional illus. 3(a)). [SM 221]
- **Three-phase model**: growth g_a for A years, declines linearly in phase B, then g_n for ever (J24 Q3(b) asked it). [SM 206–207]
- Relative valuation: $P_0 = E_0$ × P/E multiple — avoids estimating g and k. [SM 207–208]

PROBLEMS BOX · MULTI-STAGE DDM (Q3(b) — RECOMPUTED BY SCRIPT m06_patterns.py)

WORKED PATTERN · SM ILLUSTRATION 6 (TWO-STAGE)

- D_0 ₹3.00; 25% for 5 years; then 7%; k 14%.
- Step I: PV of D_1–D_5 = ₹ (3.29 + 3.61 + 3.96 + 4.34 + 4.76) = ₹19.96.
- Step II: $P_5 = 3.00(1.25)^5(1.07) \div (0.14 - 0.07)$ = ₹140; ÷ $(1.14)^5$ = ₹72.71.
- Step III: ₹19.96 + ₹72.71 = **₹92.67**. [SM 205]

The SM rounds each PV (exact 19.94 → ₹92.62); either is accepted.

THREE-PHASE · SM ILLUSTRATION 8 (= J24 Q3(b) TYPE)

D 2.00 next year; 10% for four years; then 0.09, 0.08, 0.07, 0.06; k 14%: ₹6.656 + ₹4.27 + ₹17.761 → **₹28.69** ($(1.14)^7$ = 2.5023). [SM 207]

EPS + PAYOUT · ADDITIONAL ILLUS. 2 (CHANDRA)

EPS ₹7, DPS ₹2.50, 10% for 3 years then 3%, payout 60%, k 16%: EPS_4 ₹9.60, DPS_4 ₹5.76, P_3 = ₹44.31; P_0 = 2.37 + 2.25 + 2.13 + 28.39 = **₹35.14**. [SM 220]

DEC'25 Q3(b) LMN (OUR WORKING)

- D_0 ₹25; 12% then 10%; then g = 18% × 50% = **9%**; k 14% (ignore the 18% factors).
- D_1 28.00 · D_2 30.80 · D_3 33.572 → P_2 = 33.572 ÷ (0.14 − 0.09) = **₹671.44**.
- V_0 = 28 × 0.877 + 30.80 × 0.769 + 671.44 × 0.769 = **₹564.58** > ₹550 → **under-valued**, buy.

JUN'26 Q3(b) ZENITH (OUR WORKING)

- D_0 ₹3.60; 12% for 2 years; g = 15% × 40% = 6%; k 12%: D_1 4.032, D_2 4.516, D_3 4.787, P_2 = ₹79.78.
- V_0 = **₹70.78**; market price by P/E = 14 × ₹6 = **₹84** → over-valued.

PRACTISE THESE (MOST LIKELY FIRST)

D25, J26, D24 Q3(b) · J25 Q3(b) (find g backwards) · D23, J24 Q3(b) (three stages) · MQP Q3(b), PTP Q3(b) · MCQs D23, J24, D24, J25 Q1(ii) · SM Illus. 1–8, Additional illus. 1–10 (SM 219–223), solved case 1 (SM 234) · SM exercise MCQs

9–10 · **ICMAI Practice Workbook Ch4 illus. 1, 5, 6, 9; Ch1 illus. 8, 15** · MCQ bank Q56, Q57, Q66, Q68, Q70.

C Bond valuation · Q4(a) 6.2

- **Price varies inversely with yield**: required yield down → price up. [SM 219]
- **YTM** = the rate that equates the PV of the bond's cash flows with its price; earned only if held to maturity and coupons are reinvested at the YTM. [SM 215–216]
- **Yield to call**: return if bought at today's price and held till called (Illus. 15: 6.95%). The bond callable at the lower price has the higher YTM. [SM 210, SM 217–218, SM 225]
- **Realised compound yield** = (total ending wealth ÷ price)$^{1/n}$ − 1. [SM 218]
- Types (MCQ): zero coupon (issued at a discount), convertible, puttable (holder may sell back at par), callable, exchangeable (another firm's shares), high-yield / junk, perpetual, floating rate, inflation bonds. [SM 211–212]
- A premium bond (coupon > YTM) moves towards par as time passes — its price falls. [SM 226]

Bond-value layout
coupon × PVIFA + redemption × PVIF = value

↓

value v market price → under / over-priced

↓

duration table: Year · Cash flow · PVIF · PV · Year × PV

REVISION SHEET

Item	Rule	SM
Gordon	$D_1 \div (k - g)$	[SM 202]
Return	$D_1 \div P_0 + g$	[SM 206]
Growth	b × ROE	[SM 209]
Bond value	C × PVIFA + FV × PVIF	[SM 213]
YTM approx	[C + (M − P)/n] ÷ (0.4M + 0.6P)	[SM 217]
Current yield	coupon ÷ price	[SM 215]
⚠ Duration	Σ t × PV ÷ price; ÷ (1 + YTM) = volatility	WB Ch4

TRAPS

- D_0 v D_1: "has just paid" is D_0 — grow it once before Gordon.
- Terminal value at the end of year n uses D_{n+1} and is discounted with the year-n factor, not year n + 1.
- Two PV tables given: use the one at the required return k; the other is a distractor (or for the bond's YTM).
- Premium redemption: discount the redemption value (₹1,050 / ₹1,060), not the face value.
- Semi-annual: halve the coupon and the rate, double the periods.
- Convertible: the straight value uses the **plain-bond** rate, not the coupon.

MEMORY HOOK

"Grow, settle, cap, discount, compare" — the five lines of every Q3(b).

PROBLEMS BOX · BOND (Q4(a) — RECOMPUTED BY SCRIPT)

WORKED PATTERN · SM ILLUSTRATIONS 10–12, ADDITIONAL 11

- 10-year 12% bond, ₹10,000, yield 13%: 1200 × 5.426 + 10000 × 0.295 = **9461.2**. [SM 213]
- 8-year 12%, ₹1,000, semi-annual, 14%: 60 × 9.447 + 1000 × 0.339 = **₹906**. [SM 214]
- Redeemable at ₹1,050, 12% coupon, 13%: 651.12 + 309.75 = **₹960.87**. [SM 224]

⚠ DURATION · ICMAI WORKBOOK CH4 ILLUS. 10

₹10,000, 10%, 5 years, YTM 15%: price ₹8,324.20; Σ year × PV = 33,987.50 → duration **4.083 years**; volatility 4.083 ÷ 1.15 = **3.5504**.

DEC'25 Q4(a) (OUR WORKING, SAME TEMPLATE)

- ₹1,000, 11%, 6 years, YTM 15%: 110 × 3.784 + 1000 × 0.432 = **₹848.24**.

- YTM approx (₹850, 8%, 9 years): (80 + 16.66) ÷ (400 + 510) = **10.62%**. [SM 217]

- Duration **4.576 years**; volatility 4.576 ÷ 1.15 = **3.979%**.
- +100 bp: 848.24 × (1 − 0.03979) = **₹814.49**; −75 bp: 848.24 × (1 + 0.75 × 0.03979) = **₹873.55**.

⚠ CONVERTIBLE · JUN'23 Q4(a) SROIC (OUR WORKING)

- Straight value at 9.5%: 85 × 2.5089 + 1000 × 0.7617 = **₹974.96**; conversion value 25 × ₹45 = **₹1,125**.
- Premium (1,175 − 1,125) ÷ 1,125 = **4.44%**; downside risk (1,175 − 974.96) ÷ 974.96 = **20.52%**; parity price 1,175 ÷ 25 = **₹47**.

PRACTISE THESE

D25, J26 Q4(a) · MQP Q4(a) (= J26), PTP Q4(a) · **convertibles J23, D23, J24, D24 Q4(a)** (due) · J25 Q4(a) (zero coupon) · MCQs J25 Q1(iv), D25 Q1(vi), J26 Q1(vi), MQP / PTP Q1(vi) · SM Illus. 9–15, Additional illus. 11–24 (SM 224–227) · **ICMAI Practice Workbook Ch4 illus. 2, 3, 4, 7, 8, 10** · MCQ bank Q58–Q65, Q67, Q69, Q71–Q73, Q213.

Module 15 · Foreign exchange market P14 · 15.1–15.5

SM pp. 635–670 (exercise 671–684). **Rising: 9–11 marks in the last four papers** (expected 11.0). **Q7(a)** = cross rates (J26), triangular arbitrage (D25, also MQP), investing abroad with forward cover (D23), parity (J25 Q7(b)); **MCQs (xiii) exchange rates / arbitrage and (xiv) parity** every paper since Dec'25. 15.1 market structure and 15.4 currency derivatives: never asked (read the headings).

Paper	Long question	MCQ
Jun'23	–	direct quote of EUR from USD cross rates
Dec'23	Q7(a) invest 6 months in a UK fund or Euro T-bills (forward rates)	90-day forward by IRP
Jun'24	–	bank buying rate for an export bill (0.20% margin)
Dec'24	Q7(b) two-way quotes: % change, encash now or later	annualised forward premium on the ask
Jun'25	Q7(b) Fisher nominal rates, IRP forward, PPP spot	US T-bill rate from spot and forward (IRP)
Dec'25	**Q7(a) triangular arbitrage GBP / USD / INR** (SM example's GBP/USD quote)	EUR/INR cross rate · inflation v expected spot = PPP
Jun'26	**Q7(a) EUR/INR cross rate, arbitrage on a receivable**	arbitrage via implied cross · 6-month IRP forward

HOW IT IS ASKED

- **Q7(a)**: three two-way quotes → implied cross rate → is there an arbitrage? → the steps and the profit on a stated sum. Or a receivable converted direct v through a third currency.
- **Parity sums**: nominal rates by Fisher, forward by IRP, expected spot by PPP — one formula each.
- **MCQs**: cross rate from two-way quotes, forward premium annualised, IRP forward, the parity that a statement describes.

A Formula sheet — when to use

Formula	When to use · notes	SM
Bid = dealer buys (customer sells); **ask / offer** = dealer sells (customer buys); spread = ask − bid	Choose the side from the **dealer's** view: you sell to the bank at its bid, buy at its ask.	[SM 642–643]
Direct quote: forward > spot → foreign currency at a **premium**; indirect: forward < spot → premium	Premium / discount questions; swap points rising = premium (direct).	[SM 645]
Annualised premium = (forward − spot) ÷ spot × 100 × 12 ÷ months (direct)	Indirect quote: (spot − forward) ÷ forward × 100 × 12 ÷ months. Positive = appreciation.	[SM 645]
Foreign currency appreciating: forward = spot × (1 + %); home currency appreciating: spot ÷ (1 + %)	Forward rate from a stated % move.	[SM 644]
Cross rate: bid A/B = bid A/C × bid C/B; ask A/B = ask A/C × ask C/B	Through a common currency C. Bid A/B = 1 ÷ ask B/A; ask A/B = 1 ÷ bid B/A.	[SM 646]
Triangular arbitrage: compare the implied cross with the quoted one; sell the currency that is over-priced	Three conversions, each at the side the dealer gives you; profit = end − start.	[SM 649]
PPP: $e_t = e_0 \times (1 + i_h) \div (1 + i_f)$	Expected spot from inflation; e_0 as a direct quote of the home country; for t years raise both to t.	[SM 662]
IRP: $f_1 \div e_0 = (1 + r_h) \div (1 + r_f)$	Forward rate from interest rates **for the period** (r × months ÷ 12); premium = interest differential.	[SM 665]

Fisher: (1 + nominal) = (1 + real) × (1 + expected inflation)	Nominal rate from real + inflation; approx. r = a + i.	[SM 668]

B Quotes, cross rates and arbitrage · Q7(a) 15.2 · 15.3

- **Direct quote**: one unit of foreign currency in home currency ($1 = ₹40.00 in India); **indirect**: ₹1 = $0.025. **American quote**: per unit of a currency in US$; **European**: per US$ in another currency. [SM 642]
- **Determinants** of exchange rates: interest-rate differentials, inflation differentials, government policies, market expectations, investment opportunities, speculation. [SM 642]
- **Spread** is narrow when the rate is stable or volume high; wide when volatile or thinly traded. $1 = Rs. 40.00 – 40.25 → spread Rs. 0.25. [SM 643–644]
- **Cross rate** = a rate between two currencies not quoted against each other but against a common one; Peso via Euro: 57.50 × (1 ÷ 17.50) ≈ Rs. 3.2833. [SM 645]
- **Two-point arbitrage**: one pair in two centres (London 1.55, New York 1.60 per £) — buy cheap, sell dear. [SM 648]
- **Spot** = settlement on the second working day; **forward** = rate contracted today for a future date; both parties bound. [SM 647]

1 · Implied cross rate
bid × bid, ask × ask through the common currency

↓

2 · Compare with the quoted rate
quoted bid > implied ask, or quoted ask < implied bid → arbitrage

↓

3 · Route
start in the currency you hold; sell where it is dear, buy where cheap

↓

4 · Three conversions
each at the dealer's bid (you sell) or ask (you buy); profit = end − start

⚠ SM SLIPS
SM 646 prints the cross-rate rule as "Bid A/C + Bid C/B" — it is a product (×). The Peso example rounds 1 ÷ 17.50 to 0.0571 (exact ₹3.2857).

PROBLEMS BOX · CROSS RATE / ARBITRAGE (Q7(a) — RECOMPUTED BY SCRIPT m15_patterns.py)

WORKED PATTERN · SM THREE-POINT ARBITRAGE EXAMPLE

- GBP/USD £1 = $ 1.5715-721 · USD/JPY $1 = ¥ 106.090-120 · GBP/JPY £1 = ¥ 176.720-831; start with £1,000,000; sterling over-priced against yen.
- Sell £ for ¥ at the bid ¥176.720 → ¥176,720,000.
- Sell ¥ for $ at the offer ¥106.120 → $1,665,284.58.
- Sell $ for £ at $1.5721 → £1,059,273.95: **profit 5.9%**. [SM 649]

DEC'25 Q7(a) ASHAN — USD 80,000 (OUR WORKING)

- Implied GBP/INR via USD = 1.5715 × 85.5050 – 1.5740 × 85.5085 = **₹134.37 – 134.59**; quoted £1 = ₹113.44 – 113.45 → GBP is cheap in rupees: arbitrage exists.
- USD → INR at 85.5050 = ₹68,40,400 → GBP at 113.4487 = £60,295.09 → USD at 1.5715 = **$94,753.74**.
- Profit = **$14,753.74**.

JUN'26 Q7(a) APEX — € 1,000,000 RECEIVABLE (OUR WORKING)

- Cross EUR/INR via USD: bid 1.1400 × 85.20 = **97.128**; ask 1.1450 × 85.50 = **97.8975**; quoted 95.20 – 95.90.
- Sell € for $ at 1.1400, $ for ₹ at 85.20 → **₹9,71,28,000** v direct at 95.20 → ₹9,52,00,000: route through USD gains **₹19,28,000**.

PRACTISE THESE (MOST LIKELY FIRST)

D25, J26 Q7(a) · MQP Q7(a) (triangular), PTP Q7(a), Q7(b) · D23 Q7(a) (invest abroad with forward cover) · D24 Q7(b) (two-way quotes) · MCQs J23 Q1(v), J24 Q1(xi), D24 Q1(iii), D25 Q1(xiii), J26 Q1(xiii), MQP / PTP Q1(xiii) · SM exercise sums 1, 3, 9 (SM 679–681) and M16 sum 1 (SM 711) · SM exercise MCQs (list 2) 1, 5, 7–10, 14–17, 19–22, 25, 26, 33, 34 · **ICMAI Practice Workbook Ch9 illus. 1, 2, 3, 4, 5, 6, 7, 8, 9, 12** · MCQ bank Q148, Q149, Q151, Q161, Q212, Q220, Q221, Q223–Q226.

C Parity relationships · J25 Q7(b) and MCQ (xiv) 15.5

- **PPP (relative)**: the currency of the country with the higher inflation depreciates; change in the rate = inflation differential $(i_h - i_f) \div (1 + i_f)$. [SM 662]
- **IRP**: the currency with the lower interest rate is at a forward **premium**; holds only with free capital movement, no taxes, no restrictions. [SM 664]
- No IRP → **covered interest arbitrage**: borrow in the low-rate currency, convert spot, invest, sell the proceeds forward. [SM 665, SM 667]
- IRP implications: domestic rate < foreign → foreign currency at a forward discount; if the discount is not large enough, arbitrage. [SM 667]
- The parity family: PPP, Fisher effect, international Fisher effect, IRP, forward rate as an unbiased predictor of the future spot. [SM 661]

⚠ SM SLIP · ILLUSTRATION 7

The question gives India 2.5% and UK 5.5% inflation, but the solution uses India (home) 5.5% and UK 2.5% → ₹81.3122/£. Read which country is which before you put i_h on top.

PROBLEMS BOX · PARITY (RECOMPUTED BY SCRIPT)

WORKED PATTERN · SM ILLUSTRATIONS 6, 9, 10

- PPP: UK 3%, India 6%, ₹78/£ → 78 × (1 + 0.06) ÷ (1 + 0.03) = **80.27**; after 2 years 78 × 1.1236 ÷ 1.0609 = **82.61**. [SM 662–663]
- IRP: rupee 8%, sterling 5%, ₹79/£, 6 months: 79 × (1 + 0.08 × 6/12) ÷ (1 + 0.05 × 6/12) = **80.1561**. [SM 665]
- Yen: 0.0038 × (1 + 0.10 × 90/360) ÷ (1 + 0.07 × 90/360) = **$0.003828**. [SM 665]
- Covered interest: €761,250 sold forward at €0.74/$ → $1,028,716; gain $8,716 over investing in dollars. [SM 664–665]

JUN'25 Q7(b) NOVANTA (OUR WORKING)

- India inflation = (6.3 + 6.8) ÷ 2 = 6.55%; nominal = 1.012 × 1.0655 − 1 = **7.83%**; US = 1.015 × 1.024 − 1 = **3.94%**.
- IRP forward = 82.50 × 1.0783 ÷ 1.0394 = **₹85.59**; PPP spot = 82.50 × 1.0655 ÷ 1.024 = **₹85.84**.

PRACTISE THESE

J25 Q7(b) · MCQs D23 Q1(xiii), J25 Q1(ix), D25 Q1(xiv), J26 Q1(xiv), MQP / PTP Q1(xiv) · SM Illus. 6–13 · SM exercise sums 2, 4–7, 10, 11 (SM 680–681) · **WB Ch9 illus. 11, 13, 14** · MCQ bank Q150, Q179, Q219, Q222.

R Revision sheet and traps

Item	Rule	SM
Cross bid / ask	bid × bid / ask × ask	[SM 646]
Bid from ask	bid A/B = 1 ÷ ask B/A	[SM 646]
Premium p.a.	(F − S) ÷ S × 12 ÷ months	[SM 645]
PPP	$e_0 (1 + i_h) \div (1 + i_f)$	[SM 662]
IRP	$e_0 (1 + r_h) \div (1 + r_f)$	[SM 665]
Fisher	(1 + a)(1 + i) − 1	[SM 668]

TRAPS

- Use the dealer's side every time: you **sell** at the bid, **buy** at the ask — never the mid-rate.
- IRP rates are **per period**: 8% p.a. for 6 months = 4%.
- Home currency on top: with a direct quote ₹/£, India is the home country.
- Show the "no arbitrage" test before the steps — the marks come for both.
- State the profit in the currency you started with.

MEMORY HOOK

"Dealer buys low (bid), sells high (ask)." PPP = Prices, IRP = Interest — same fraction, home over foreign.

Module 2 · Risky investment proposals P14 · 2.1–2.4

SM pp. 69–102 (exercise 103–110). **7–12 marks every paper** (expected 10.3): **Q3(a) a risk-analysis sum in all 6 papers** since Dec'23 — ENPV / SD / CV the last three running (J25, D25, J26), payoff table D23, scenario J24, simulation D24, decision tree J23 (and the MQP) — plus **MCQs (ii) sensitivity and (iii) certainty equivalent**.

Paper	Q3(a)	MCQ
Jun'23	decision tree, 2-year project (= SM Illus. 9 type)	least risky by CV
Dec'23	payoff table: expected values + minimax regret	–
Jun'24	best-case and worst-case scenario NPVs	abnormal risk premium via IRR; normal-distribution range
Dec'24	Monte Carlo: five runs, average NPV	–
Jun'25	two projects: ENPV, SD, CV	–
Dec'25	**expected inflows, CV v an industry benchmark CV**	CE coefficient · sensitivity to project cost
Jun'26	joint probabilities, SD from CV, NPV at risk-adjusted rates	CE coefficient · sensitivity of cash flow

HOW IT IS ASKED

- **Q3(a)**: probabilities × cash flows → expected value → SD → CV → "which is less risky / acceptable against the benchmark?" Variants: joint probabilities over two years (decision tree), scenario NPVs, simulation with given random numbers.
- **MCQ (ii)**: the % change in cost / cash flow / life / rate that makes NPV zero. **MCQ (iii)**: certainty-equivalent coefficient or riskless cash flow.

A Formula sheet — when to use

Formula	When to use · notes	SM
CE coefficient α_t = riskless ÷ risky cash flow; NPV = $-CF_0 + \Sigma\ \alpha_t\ CF_t \div (1 + i)^t$	Certainty equivalent: α between 0 and 1; discount at the **risk-free** rate.	[SM 69–70]
RADR = cost of capital (or risk-free) + risk premium	Discount the risky cash flows at the higher rate (Illus. 1: 13% + 2% = 15%).	[SM 71]
Expected CF = $\Sigma\ P_i\ CF_i$; SD = $\sqrt{[\Sigma\ P_i\ (CF_i - \text{mean})^2]}$	Hillier model step 1, year by year.	[SM 71]
ENPV = $\Sigma\ A_t \div (1 + i)^t - I$; perfectly correlated: $\sigma(\text{NPV}) = \Sigma\ \sigma_t \div (1 + i)^t$	Step 2; discount at the risk-free rate. Independent flows: square root of $\Sigma\ \sigma_t^2 \div (1 + i)^{2t}$.	[SM 72]
CV = SD of NPV ÷ expected NPV	Compare projects of different size: the higher CV is the riskier.	[SM 75–76]
Z = (NPV − expected NPV) ÷ SD of NPV	Probability of an NPV range from the normal table.	[SM 76]
Sensitivity: the value of one input that makes NPV = 0, as a % of its estimate	One variable at a time, others held at their estimates.	[SM 83–84]
Decision tree: NPV per path × joint probability = expected NPV	Two-year trees; joint probability = P(year 1) × P(year 2 given year 1).	[SM 77–79]

B ENPV, SD, CV and decision trees · Q3(a) 2.1

1 · Expected cash flow
Σ probability × cash flow (per year / per project)

↓

2 · SD
√ Σ P (CF − mean)^2 (or given / from CV × mean)

↓

3 · Expected NPV
PV of expected flows − outlay

↓

4 · CV and decide
lower CV = less risk; compare with the benchmark CV

ICMAI layout: table Probability · Cash flow · P × CF · (CF − mean)^2 × P for each project, then a CV line and the advice.

- Three decision situations: complete certainty, complete uncertainty, risk. [SM 69]
- Techniques: certainty equivalent, RADR, expected NPV and SD, decision tree; advanced: sensitivity, scenario, simulation. [SM 69]
- **CE coefficient** falls as risk rises (inverse relationship). [SM 70]
- **Hillier model**: risk = SD of the expected cash flows; ENPV and σ(NPV) depend on whether the flows are perfectly correlated, independent or moderately correlated. [SM 71–72]
- **Decision tree**: analyses proposals with sequential decisions and project flexibility; each path is one outcome. [SM 77–78]

⚠ SM SLIP · ILLUSTRATION 7
It says "refer to Illustration 6" but uses Illustration 5's ENPV ₹16,215.75 and SD ₹34,268, and prints P(Z ≥ 0.11) = 1 − (0.5 + 0.4602) = 3.98%. For Z = 0.11 the table area is 0.0438, so P = 0.4562 (45.6%). Learn the method from Illustration 8.

PROBLEMS BOX · RISK ANALYSIS (Q3(a) — RECOMPUTED BY SCRIPT m02_patterns.py)

WORKED PATTERN · SM ILLUSTRATION 2 (EXPECTED CF AND SD)

Project M (₹'000)	P × X	(X − 16)^2 × P
0.10 × 12 · 0.20 × 14 · 0.40 × 16 · 0.20 × 18 · 0.10 × 20	16.0	4.8
SD = √4.8		**2.19**
Project N: 8, 12, 16, 20, 24 (0.10, 0.25, 0.30, 0.25, 0.10)	16.0	20.8 → **4.56**

Same mean, N has the larger SD. [SM 71–72] CV: M 0.137, N 0.285 → N is riskier.

CV · SM ILLUSTRATION 6

X: 4,800 ÷ 12,000 = **0.4**; Y: 5,800 ÷ 14,000 = **0.414** → Y riskier; prefer X. [SM 75–76]

DECISION TREE · SM ILLUSTRATION 9 (= J23 Q3(a) TYPE)

Outlay ₹40,000; year 1 ₹25,000 or ₹30,000; three year-2 outcomes each; 12%. Six paths: worst −8,111 (joint probability 0.08), best 10,703 (0.06); expected NPV **₹2,045.40** → accept. [SM 78–80]

NORMAL DISTRIBUTION · SM ILLUSTRATION 8

ENPV ₹800, SD ₹400: P(NPV ≤ 0) = P(Z ≤ −2) = 1 − (0.50 + 0.4772) = **0.0228**. [SM 76]

DEC'25 Q3(a) ARON (OUR WORKING), ₹ LAKH

- E(A) = 7 × 0.2 + 9.5 × 0.5 + 12 × 0.3 = **9.75**; E(B) = 5 × 0.3 + 10 × 0.4 + 14 × 0.3 = **9.70**.
- CV A = 1.8 ÷ 9.75 = **0.1846**; CV B = 2.5 ÷ 9.70 = **0.2577**.
- Benchmark = average of 1.6/8, 2.2/10, 1.8/9 = **0.2067** → A is below the benchmark, B above: **choose A**.

OTHER Q3(a) VARIANTS — WHAT TO DO

- **Joint probabilities** (J26): tree of year-1 × year-2 outcomes; SD from CV = CV × mean.
- **Payoff table** (D23): expected value per act; regret = best in that state − payoff; choose the smallest maximum regret.
- **Scenario** (J24): NPV with all-best inputs and all-worst inputs (SM Illus. 12).
- **Simulation** (D24): cumulative probabilities → random-number ranges → read the given random numbers → NPV per run → average.

PRACTISE THESE (MOST LIKELY FIRST)

D25, J25, J26 Q3(a) · MQP Q3(a) (decision tree), PTP Q3(a) · J23 Q3(a) · D23 Q3(a) · J24 Q3(a), postal Q2(a) (scenario) · D24 Q3(a) (simulation) · MCQs J23 Q1(ii), J24 Q1(i), Q1(iv), D25 Q1(iii), J26 Q1(iii), MQP / PTP Q1(ii)–(iii) · SM Illus. 1–10, 12 · SM exercise sums 1–4 (SM 106–107) · **ICMAI Practice Workbook Ch1 illus. 3, 12, 13; Ch2 illus. 2, 3, 6–14** · MCQ bank Q16, Q19–Q21, Q23, Q178.

C Sensitivity, scenario, simulation · MCQ (ii) 2.2–2.4

WORKED PATTERN · SM ILLUSTRATION 11 (SENSITIVITY — RECOMPUTED)

- Investment ₹1,00,000; 3 years; inflows ₹2,00,000, outflows ₹1,50,000; 10%: ENPV = −1,00,000 + 50,000 × (0.909 + 0.826 + 0.751) = **₹24,300**.
- Investment can rise to ₹1,24,300 → **24.30%**; NCF can fall to ₹40,225 → **19.55%**; life to 2.35 years → **21.67%**; rate to **23.4%**. [SM 83–84]

The **lowest** % is the most sensitive variable (here net cash inflow).

PRACTISE

D25, J26 Q1(ii), MQP Q1(ii) · SM Illus. 11, exercise sum 5, solved case 1 (SM 107–108) · **WB Ch2 illus. 1, 4, 5** · MCQ bank Q17, Q22, Q175.

- **Sensitivity**: each estimate in turn, others held constant, to see how far it may move before the decision changes. [SM 83]
- **Scenario analysis**: base case (most likely inputs), best case (lowest rate, highest flows), worst case (highest rate, lowest flows) → a range of NPVs. [SM 85]
- **Simulation steps**: determine the probabilistic variables; define their distributions; check correlation; run the simulation; decide. [SM 87]
- Simulation allocates **random-number ranges** to cash flows by cumulative probability. [SM 99–100]

Item	Rule	SM
CE	riskless ÷ risky; risk-free rate	[SM 69–70]
CV	SD ÷ expected NPV	[SM 75]
Z	(X − ENPV) ÷ SD	[SM 76]
Sensitivity	change to NPV = 0 ÷ estimate	[SM 84]

TRAPS

- CE flows are discounted at the **risk-free** rate; RADR flows at the risk-adjusted rate — never both adjustments.
- CV decides when means differ; SD alone only when means are equal.
- Joint probability = product along the path; the path probabilities must add to 1.

Module 1 · Investment decisions P14 · 1.1–1.5

SM pp. 6–59 (exercise 60–68). **9 marks in every paper since Jun'24** (expected 9.0): **Q2(a) an NPV sum in all 6 papers — every December a machine replacement** (D23, D24, D25 with a subsidy) — plus **MCQ (i)** on MNPV / MIRR (three times), PI or APV. Capital rationing (1.4) and social cost-benefit (1.5): never asked.

Paper	Q2(a)	MCQ (i)
Jun'23	overhaul v replace parts (costs rising 5%); case Q8: EAC, real v nominal	base-case NPV of a perpetuity
Dec'23	**replacement**: annual savings, PV, viability	APV with a perpetual debt tax shield
Jun'24	new AI system: savings, deferred payment, advance maintenance	–
Dec'24	**replace a manual machine**: cash savings, NPV	reinvestment rate from MNPV
Jun'25	replacement with trade-in, WDV, staged working capital	MNPV at 12% reinvestment
Dec'25	**replacement with a 15% subsidy: NPV and PI**	initial outlay from PI
Jun'26	new project: capacity build-up, WDV, extra working capital	initial investment from MNPV

HOW IT IS ASKED

- **December Q2(a)**: old machine (book value, sale value, remaining life) v new machine (price + installation, salvage, subsidy) → incremental savings → incremental depreciation → tax → CFAT → NPV and PI at the given factors.
- **Twists**: subsidy received at the end of year 1; trade-in price; WDV depreciation; working capital staged and released at the end; "ignore tax on the loss on the old machine".
- **MCQ (i)**: MNPV / MIRR either way; outlay from PI; APV.

A Formula sheet — when to use

Formula	When to use · notes	SM
CFAT = EBIT (1 − t) + depreciation	Interest is excluded (financing decision); depreciation added back.	[SM 7–8]
Initial outflow = cost + installation + working capital − salvage of old asset (± tax)	Replacement: sale value of the old machine is an inflow at t_0; sunk cost ignored.	[SM 6–7]
Terminal inflow = salvage ± tax on loss / gain on sale + release of working capital	Last year of the project.	[SM 9]
PI = PV of inflows ÷ PV of outflows (or ÷ initial outlay)	Accept if > 1; rank by PI when outlays differ; MCQ: outlay = PV of inflows ÷ PI.	[SM 18–19]
APV = base-case NPV + PV of tax shield on debt − issue costs	Adjusted NPV (MCQ D23, MQP).	[SM 20–21]
IRR = lower rate + (higher − lower) ÷ (NPV_L − NPV_H) × NPV_L	Interpolation between two trial rates; at IRR, PI = 1.	[SM 22–23]
MIRR = (FV of inflows at the cost of capital ÷ PV of outflows)$^{1/n}$ − 1	One IRR even for non-conventional flows.	[SM 25]
MNPV = terminal value (inflows compounded at the reinvestment rate) × PVIF − outlay	Terminal-value method; MCQ asks it backwards (rate or outlay).	[SM 26–27]
EAC / EAB = NPV ÷ PVIFA (× capital recovery factor)	Unequal lives: compare the annual equivalent.	[SM 30]
Payback reciprocal = CFAT p.a. ÷ initial investment	Rough IRR proxy (MCQ).	[SM 14]

Real cash flow = nominal ÷ (1 + inflation)^t; (1 + nominal rate) = (1 + real)(1 + inflation)	Discount real with real, nominal with nominal.	[SM 35]

B The replacement NPV · Q2(a) 1.1

1 · Net outlay at t_0
new cost + installation + testing − sale of old (± tax on loss / gain) + working capital

↓

2 · Incremental savings
savings − extra costs (salaries, maintenance)

↓

3 · Incremental depreciation
new − old (SLM or WDV as told)

↓

4 · CFAT
(savings − depreciation) × (1 − t) + depreciation

↓

5 · Discount
CFAT × factors + subsidy / salvage / working capital at their years → NPV, PI → advise

- Initial cash flow includes cost, installation, transport and incidental costs; **sunk cost is ignored**. [SM 6]
- Replacement: the old item's salvage value is an inflow subtracted from the outlay; extra working capital is an outflow. [SM 7]
- **Interest exclusion principle**: interest is a financing charge, not deducted when estimating cash inflows. [SM 7]
- Relevant costs = future costs that differ between alternatives; SM Illus. 2: book value of the old machine is sunk (not relevant); its current salvage and the new machine's cost and operating costs are relevant. [SM 9–10]
- NPV **advantages**: time value, all cash flows, adds to shareholders' wealth; **limits**: ignores size of outlay and different lives — hence PI and EAC. [SM 18]
- Capital rationing: **divisible** projects ranked by PI; **indivisible** — accept whole or reject (combinations). [SM 38]

PROBLEMS BOX · REPLACEMENT NPV (Q2(a) — RECOMPUTED BY SCRIPT m01_patterns.py)

WORKED PATTERN · ICMAI WORKBOOK CH1 ILLUS. 9 (NEW INDIA LTD)

Cost of the new machine	2,20,000
Less: sale value of the old machine	(50,000)
Less: tax saving on loss [(1,50,000 − 10,000 × 5) − 50,000] × 35%	(17,500)
Add: additional working capital	30,000
Net cash outflow	**1,82,500**
Sales + 60,000 − costs 20,000 − extra depreciation (22,000 − 10,000) 12,000 = PBT	28,000
PAT (35% tax) + depreciation 12,000 = CFAT, years 1 to 10	30,200
30,200 × 6.145 + working capital 30,000 × 0.386	1,85,579 + 11,580
NPV = 1,97,159 − 1,82,500 → replace	**14,659**

DEC'25 Q2(a) PEGUS — THE DECEMBER TEMPLATE (OUR WORKING)

- Cost of Y = 24,00,000 + 1,40,000 + 60,000 = 26,00,000 − sale of X 1,80,000 = **₹24,20,000** net outlay (tax on the loss ignored, as told).
- Savings 3 × 1,68,000 + 4,80,000 + 3,50,000 − 3,90,000 − 1,54,000 = **₹7,90,000**.
- Depreciation Y (26,00,000 − 3,20,000) ÷ 6 = 3,80,000 − X 4,80,000 ÷ 6 = 80,000 → incremental 3,00,000.
- CFAT = (7,90,000 − 3,00,000) × 0.70 + 3,00,000 = **₹6,43,000** × 3.888 = 24,99,984.
- + subsidy 15% × 24,00,000 at year 1: 3,15,720 + salvage 3,20,000 × 0.456 = 1,45,920 → PV inflows **₹29,61,624**.
- **NPV ₹5,41,624; PI 1.2238** → replace. ⚠ Assumption stated: depreciation on full cost, subsidy a separate inflow (if the subsidy reduces the cost, recompute depreciation).

PRACTISE THESE (MOST LIKELY FIRST)

D25, D24, D23 Q2(a) (December replacement) · J25 Q2(a) (trade-in, WDV) · J26, J24 Q2(a) (new project) · MQP Q2(a) (choose CD or EF) · J23 Q2(a) · SM Illus. 2–16 · SM exercise sums 1–2 (SM 63) · **ICMAI Practice Workbook Ch1 illus. 1, 9, 11, 14** · MCQ bank Q1, Q2, Q4–Q6, Q8–Q10, Q173, Q180, Q181.

C PI, APV, IRR, MIRR, MNPV, EAC · MCQ (i) 1.1 · 1.2 · 1.3

WORKED PATTERNS · SM ILLUSTRATIONS (RECOMPUTED)

- **PI** (Illus. 10): PV of CFAT 71,951 ÷ 70000 = **1.028** → accept. Illus. 11: PI 1.25 v 1.17 although NPV 15,000 v 20,000 → choose Project 1. [SM 18–19]
- **APV** (Illus. 12): base-case NPV (−) ₹5,12,700 + PV of tax shield 4,03,270 − issue cost 1,37,000 = **(−) ₹2,46,430** → reject. [SM 21]
- **MIRR** (Illus. 15): FV at 12% = 2,09,793; $(2.09793)^{1/5}$ − 1 = **15.97%**. [SM 26]
- **MNPV** (Illus. 16): terminal value 1,54,324 × 0.683 = 1,05,403 − 1,20,000 = **₹ −14,597** → reject. [SM 27]
- **IRR** (Illus. 13): NPV 2,720 at 10%, (1,560) at 12% → IRR = 10% + 2% × 2720 ÷ [2720 − (−1560)]. [SM 23–24] = 11.27% (⚠ the SM prints 1.28% → 11.28%; 2 × 2,720 ÷ 4,280 = 1.27.)

PRACTISE

MCQs D23, D24, J25, D25, J26 Q1(i), MQP / PTP Q1(i), postal Q1(vi) · J23 Q8 (EAC, real v nominal) · SM Illus. 15–21, 22 (capital rationing) · **WB Ch1 illus. 2, 4, 5, 6, 7, 10** · PTP Q2(a) (capital rationing) · MCQ bank Q7, Q11–Q15, Q174, Q176, Q177, Q201.

- **NPV v IRR**: NPV assumes reinvestment at the cost of capital, IRR at the IRR itself; MIRR removes the multiple-IRR and reinvestment problems. [SM 22, SM 25]
- **MNPV / terminal value**: compound each inflow at the reinvestment rate to the end, discount the total at the cost of capital, deduct the outlay. [SM 26–27]
- **Unequal lives**: equivalent annual benefit / cost resolves the conflict. [SM 30]
- **Abandonment value**: abandon when the abandonment value exceeds the PV of the remaining cash flows. [SM 32]
- **Inflation**: nominal cash flows ÷ inflation → real cash flows, discounted at the real rate; or nominal at the nominal rate — same answer. [SM 35]

Item	Rule	SM
CFAT	EBIT (1 − t) + depreciation	[SM 8]
PI	PV inflows ÷ outlay	[SM 18]
MIRR	$(FV \div PV)^{1/n} - 1$	[SM 25]
EAC	NPV ÷ PVIFA	[SM 30]

TRAPS

- Do not deduct interest from cash flows; do not count sunk costs (book value of the old machine).
- Depreciation shield is on the **incremental** depreciation (new − old).
- Working capital: outflow at the start (or when it is needed), inflow at the end.
- Subsidy at the end of year 1 → discount with the year-1 factor; state how it affects depreciation.
- Salvage at book value → no tax; above / below book value → tax on the gain / saving on the loss.

Module 9 · Asset pricing theories P14 · 9.1 · 9.2

SM pp. 383–406 (exercise 407–418). **4–11 marks every paper** (expected 7.9): **Q5(a) a CAPM / beta sum** in five of six papers (D24, J25, D25, J26; APT J24) plus **MCQs (vii) CAPM / SML and (viii) levered / unlevered beta** (D25, J26, both practice papers). The June Q6(a) "cut beta with risk-free securities" also lives here.

Paper	Q5(a)	MCQ
Jun'23	Q6(a): portfolio beta, risk-free securities to cut beta to 1.125	SML intercept = risk-free
Dec'23	(Jensen + Treynor → beta, Rf: Module 10)	SML slope = risk premium · beta from SDs and correlation
Jun'24	Q5(b) two-factor APT	characteristic line v SML
Dec'24	expected returns by probability, beta, CAPM, under / over-priced	–
Jun'25	levered beta, CAPM (T-bill yield from price)	APT v CAPM
Dec'25	CAPM return and alpha of two portfolios	equity beta after a debt-funded buy-back
Jun'26	**beta from covariance, CAPM with T-bill yield from its price, over / under-valued**	many macro factors = APT · asset beta from D/E

HOW IT IS ASKED

- **Q5(a)**: beta (covariance ÷ market variance, or ρ $\sigma_s \div \sigma_m$) → risk-free rate (often a T-bill: coupon ÷ price) → CAPM required return → compare with the expected return → under / over-valued.
- **MCQ (viii)**: levered ↔ unlevered beta with the tax factor; equity beta after a buy-back financed by debt.
- **MCQ (vii)**: SML v CML v characteristic line; APT = many factors.

A Formula sheet — when to use

Formula	When to use · notes	SM
$E(R) = R_F + \beta (R_M - R_F)$	CAPM required / equilibrium return of a security or portfolio.	[SM 384]
$\beta = Cov_{SM} \div \sigma_M^2$; $\beta = \rho_{SM}\, \sigma_S \div \sigma_M$	Beta from covariance, or from correlation and SDs.	[SM 344, SM 505]
Portfolio beta = $\Sigma\, W_i\, \beta_i$	Weights by market value.	[SM 404]
CAPM return < estimated return → **undervalued (buy)**; > → overvalued (sell)	Above the SML = under-priced; below = over-priced.	[SM 384, SM 387]
CML: $E(R_p) = R_f + \lambda\, \sigma_p$; $\lambda = (R_m - R_f) \div \sigma_M$	Efficient portfolios only; total risk (SD) on the x-axis.	[SM 385–386]
APT: $E(R) = R_F + R_1\beta_1 + R_2\beta_2 + \ldots + R_n\beta_n$	Multi-factor: one beta and one risk premium per factor.	[SM 388]
Risk-free route: buy risk-free = V × (present β − desired β); sell risk-free = V × (desired β − present β)	Change portfolio beta without futures (June Q6(a)).	[SM 388]
$\beta_L = \beta_U \times [1 + (1 - t) \times D/E]$; $\beta_U = \beta_L \div [1 + (1 - t)\, D/E]$	Levered (equity) ↔ unlevered (asset) beta; proxy beta for a project.	[SM 390–391]
Asset (project) beta = $W_E\, \beta_E + W_D\, \beta_D$ (debt weight × (1 − t) with taxes)	Beta balance sheet; $\beta_D = 0$ if debt is risk-free.	[SM 389]
Risk-return ratio = $(R_s - R_f) \div \beta$ (or ÷ σ)	Excess return per unit of risk.	[SM 387]

B CAPM, SML, CML, APT · Q5(a) and MCQ (vii) 9.1

- **CAPM features**: links expected return, systematic risk and value; diversification removes unsystematic risk; beta depends on market risk, asset risk and their correlation. [SM 383]
- **Assumptions**: rational, utility-maximising investors with homogeneous expectations; free information; unlimited borrowing and lending at the risk-free rate; no taxes or costs; assets divisible and marketable. [SM 383–384]
- **SML** = expected return v beta; every security and portfolio lies on it. **CML** = return v SD; only efficient portfolios; individual securities do not lie on it. [SM 384–386]
- **Characteristic line**: time series of security returns v index returns; its slope is beta. SML is cross-sectional. [SM 386–387]
- APT is a multi-factor model; CAPM a single-factor model. [SM 388]

1 · Beta
Cov ÷ σ_M^2 (or $\rho\sigma_S/\sigma_M$, or weighted)

↓

2 · Risk-free rate
given, or T-bill coupon ÷ price

↓

3 · CAPM return
$R_F + \beta (R_M - R_F)$

↓

4 · Compare
expected > CAPM → undervalued, buy; < → overvalued, sell

PROBLEMS BOX · CAPM (Q5(a) — RECOMPUTED BY SCRIPT m09_patterns.py)

WORKED PATTERN · SM SOLVED CASE 1 (FIVE-STOCK FUND)

Stock	Weight	Beta	CAPM 9 + 6β	Expected	Verdict
A	0.20	1.10	15.60%	15%	overvalued
B	0.10	0.75	13.50%	14%	undervalued
C	0.15	0.90	14.40%	15%	undervalued
D	0.25	1.20	16.20%	16%	overvalued
E	0.30	1.40	17.40%	17%	overvalued
Fund	**1.00**	**1.15**	**15.90%**		

R_f 9%, R_m 15%. [SM 403–404]

JUN'26 Q5(a) ROHAN (OUR WORKING)

- β_A = 0.020 ÷ 0.016 = **1.25**; β_B = 0.028 ÷ 0.016 = **1.75**.
- R_f = T-bill coupon 6.75 ÷ price 108 = **6.25%**.
- CAPM A = 6.25 + 1.25 × 8.75 = **17.19%** < 19% → **undervalued**; B = 6.25 + 1.75 × 8.75 = **21.56%** > 20% → **overvalued**.

APT · SM ADDITIONAL ILLUS. 14 (ITC, FIVE FACTORS)

4.5 + 0.65 − 0.224 + 2.88 − 0.30 + 2.853 = **10.36%**. [SM 403]

PRACTISE THESE (MOST LIKELY FIRST)

J26, D24 Q5(a) · MQP Q5(a), PTP Q5(a), postal Q7(a) · J24 Q5(b) (APT) · J23, J24, J25 Q6(a) (risk-free route) · MCQs J23 Q1(viii), D23 Q1(ix), (xiv), J24 Q1(xii), J25 Q1(vii), J26 Q1(vii) · SM exercise MCQs (SM 407–410, 414–415), Additional illus. (SM 393–403) · **ICMAI Practice Workbook Ch6 illus. 1, 4, 5, 10; Ch7 illus. 4, 5, 7, 8, 9** · MCQ bank Q98, Q100–Q103, Q191.

C Levered and unlevered beta · MCQ (viii) and J25 / D25 Q5(a) 9.2

- **Levered (equity, geared) beta** carries both business and financial risk; used in CAPM for the cost of equity. [SM 390]
- **Unlevered (asset) beta**: market risk with no debt — compares firms with different capital structures. [SM 390–391]
- **Proxy beta**: the beta of a levered firm arrived at from an unlevered firm's beta (project in a new line of business). [SM 389]
- Illus. 8: β_U 0.90, tax 0.30, 60% debt / 40% equity → 0.90 × (1 + 0.70 × 1.5) = 0.90 × 2.05 = **1.85**. [SM 391]
- Solved case 2: all-equity β 0.6; half the equity bought back with risk-free debt → 0.6 = 0.5 × β_E + 0.5 × 0 → **β_E = 1.20** (= D25 MCQ (viii) type). [SM 404–405]

⚠ SM SLIP

SM 305 prints β = COV_{SM} ÷ σ_m; it is ÷ σ_m^2 (the market **variance**), as SM 344 and every worked answer use.

Practise: J25, D25 Q5(a) · MCQs D25, J26 Q1(viii), MQP / PTP Q1(viii) · SM Illus. 8, solved cases 1–2 · **WB Ch6 illus. 2, 3; Ch7 illus. 1, 2, 3, 6** · MCQ bank Q96, Q97, Q99, Q195, Q198, Q200, Q214–Q217.

Item	Rule	SM
CAPM	$R_F + \beta(R_M - R_F)$	[SM 384]
Beta	Cov ÷ σ_M^2	[SM 344]
Levered β	$\beta_U[1 + (1 - t)D/E]$	[SM 390]
APT	$R_F + \Sigma R_i\beta_i$	[SM 388]
Risk-free route	V × (β − β*)	[SM 388]

⚠ TRAPS

- T-bill yield = coupon ÷ **market price**, not the face value.
- Undervalued means the expected return is **above** the CAPM return (the stock plots above the SML).
- Levered beta uses D/E (not D/total); multiply D/E by (1 − t).
- Market risk premium = $R_M - R_F$; if the question gives the premium, do not subtract R_F again.
- **Hook: "Above the line, buy the stock."** SML = beta, CML = sigma.

Module 17 · Digital finance P14 · 17.1–17.3

SM pp. 717–735 (exercise 736–740). **7–9 marks every paper** (expected 7.2): **Q8(a) a 5-mark note in all 6 papers** since Dec'23 + **MCQ (xv)** every paper. No sums. The notes are SM lists — learn them in the SM's order and wording; three of six Q8(a)s repeated an earlier one (stablecoin variants twice).

Paper	Q8(a) / long	MCQ
Jun'23	Q3(b) components of digital infrastructure (6)	not a component of digital infrastructure (stablecoins)
Dec'23	**variants of stablecoins**	benefits of UPI to merchants · not a digital asset
Jun'24	advantages of digital financial services	distributed ledger = blockchain · ecosystem components
Dec'24	**neo-bank: meaning and benefits**	pegged crypto = stablecoin · not a benefit of CBDC
Jun'25	**variants of stablecoins** (= D23)	API = the messenger
Dec'25	**CBDC: meaning and advantages**	Dogecoin
Jun'26	digital finance cube: business functions	how stablecoins stay stable

WHAT IS DUE FOR DEC'26 (PREDICTION, NOT A PROMISE)

- Asked and repeatable: stablecoin variants, neo-banks, CBDC, cube, DFS advantages, infrastructure components.
- **Not yet asked as a note**: limitations of stablecoins; UPI features / benefits; cryptocurrency advantages / disadvantages; NFTs; fintech types; benefits of digital finance; regulators' role (17.3, a PTP MCQ).
- Answer style: a one-line meaning, then the SM list as points with the SM's headings (5 marks ≈ 5–7 points).

A Meaning, traditional v digital, benefits 17.1

- **Digital finance** = delivery of traditional financial services digitally through computers, tablets and smartphones. [SM 717]
- **Benefits of digital finance** (7): boosts GDP through access to credit and products; long-term gains in banking performance (e.g. SWIFT); higher tax revenue for governments; regulators — less counterfeit currency and money laundering; users — control of personal finance, quick decisions, payments within seconds; affordable, secure banking for the poor in developing countries; **financial inclusion**. [SM 719]

MODEL ANSWER · JUN'24 Q8(a) ADVANTAGES OF DIGITAL FINANCIAL SERVICES

DFS = financial services (payments, remittances, credit) accessed and delivered through digital channels, including mobile devices. Advantages: **(a) improved customer experience** — information before availing the service; **(b) ease of access** — no branch visit, a click away; **(c) streamlined operations** — e.g. insurance from enquiry to claim settlement online; **(d) reduction in cost of delivery** — minimum physical facilities and manpower. [SM 726–727]

B Regulation and governance · MCQ 17.3

- **Role of regulators**: users well informed; stop deceptive or biased actions by service organisations; accessible grievance and dispute routes without over-burdening providers. [SM 732]
- **Fintech laws in India**: Payment and Settlement Systems Act, 2007; Master Direction on Prepaid Payment Instruments; NPCI guidelines for UPI; RBI Act, 1934 (NBFCs); NBFC peer-to-peer lending directions 2017; payment aggregator / gateway guidelines; anti-money-laundering laws (RBI); data-privacy laws. [SM 733–734]
- **Governance issues**: governance of the internet economy; intellectual property and competition; taxation; customer privacy; owning and sharing data. **Principles**: foundational regulatory objectives; reflexive, iterative regulation; responsible actors; oversight and enforcement; sustainable development. [SM 734]

Practise these: Q8(a) D23, J24, D24, J25, D25, J26 · J23 Q3(b) · MQP Q8(a), PTP Q8(a) · MCQs every paper Q1(xv), MQP Q1(xv), PTP Q1(xv) (regulators) · SM exercise short essays 1–5, essays 1–5, MCQ 5, true / false and fill-in 1–5 (SM 736–737) · MCQ bank Q152–Q159, Q231–Q233 · ICMAI Practice Workbook: no problem on this module.

C The digital finance ecosystem · Q8(a) 17.2

MODEL ANSWER · VARIANTS OF STABLECOINS (D23, J25)

A **stablecoin** is a cryptocurrency pegged to a reserve asset (fiat currency, commodity or another cryptocurrency) — a tokenized version of the asset. [SM 725]

a. **Fiat-collateralized** — linked to sovereign legal tender (Tether, TUSD).
b. **Commodity-backed** — real estate, gold, silver, other precious metals (Kitco Gold).
c. **Crypto-backed** — backed by another cryptocurrency; over-collateralised because of volatility.
d. **Algorithmic** — not backed; algorithms and code manage supply and demand.

[SM 726]

Uses: everyday currency (little fluctuation); smart contracts. **Limitations**: value rests on trust in the company holding the reserve; may lose value if it goes bankrupt; holders need solvency declarations; not meant for trading gains. [SM 725–726]

MODEL ANSWER · CBDC: MEANING AND ADVANTAGES (D25)

CBDC = digital tokens issued by a central bank, backed by it and pegged to the country's fiat currency; like paper notes a means of payment, unit of account and store of value, each unit uniquely identifiable. **Advantages**: (a) technological efficiency, lower cost; (b) tracking of transactions and location of money; (c) prevents money laundering, tax evasion, terror financing; (d) digital record of every transaction; (e) more secure payments; (f) competition and resilience in domestic payments; (g) financial inclusion. [SM 722]

MODEL ANSWER · NEO-BANK: MEANING AND BENEFITS (D24)

Neo-bank (online / internet-only / virtual / digital bank) = a direct bank operating exclusively online with no physical branches. **Benefits**: (i) convenient, user-friendly; (ii) built for a niche audience; (iii) cost-effective; (iv) savings accounts, prepaid cards, bill payments, money transfers; (v) financial management services; (vi) 24×7 support; (vii) high security; (viii) simple app interface; (ix) transparent, real-time notifications. Examples: Jupiter, Fi Money, Niyo. [SM 728–729]

MODEL ANSWER · COMPONENTS OF DIGITAL INFRASTRUCTURE (J23)

a. **Internet** — global network of networks (TCP/IP).
b. **Mobile telecom and digital communication suites**, including applications.
c. **Data centers and networks**.
d. **Enterprise portals, platforms, systems and software** (EIP).
e. **Cloud services** — on demand over the internet.
f. **Operational security, user identity and data encryption**.
g. **APIs and integrations** — the API is the "messenger" (J25 MCQ).

[SM 721]

MODEL ANSWER · DIGITAL FINANCE CUBE (J26)

Three dimensions: **(I) business functions** — digital financing (invoice financing / factoring, e-invoicing, lease financing, crowdfunding), digital investments, digital money, digital payments, digital insurance, digital finance advice; **(II) technologies** — blockchain, social networks, near field communication, peer-to-peer, big data analytics, enablers (mobile, cloud, security, automation, AI); **(III) institutions** — FinTech companies and traditional service providers. [SM 729–731]

- **UPI**: one mobile app for many bank accounts, immediate transfer round the clock, single-click two-factor authentication, virtual address (no card / account / IFSC details), QR code, merchant and bill payments, complaints from the app. [SM 727]
- UPI benefits to **merchants**: seamless collection with single identifiers; no risk of storing the customer's virtual address; reach customers without cards (D23 MCQ). [SM 728]
- **Fintech types**: alternative lending, insurtech, payments, wealthtech, regtech. [SM 729]
- **Cryptocurrency**: peer-to-peer, blockchain ledger, mined; Bitcoin (2009), Ethereum (2015), Litecoin, Dogecoin. Cons: pseudonymous, money laundering, energy use, volatility, hacks. [SM 724–725]
- **NFTs**: unique cryptographic tokens on a blockchain, created by asset tokenization; not interchangeable like cryptocurrency units. [SM 723]

Module 3 · Leasing decisions P14 · 3.1–3.3

SM pp. 111–134 (exercise 135–146). **7 marks in every paper since Dec'23** (expected 7.0): **Q2(b) a leasing sum in all 6** — the lessor's rental in 4 of the last 5 (J24, J25, D25, J26), **lease v buy** in D23 and D24 (both December papers: due). No MCQ trend; 3.3 cross-border leasing / sale and lease back never asked (PTP Q8(c)).

Paper	Q2(b)
Dec'23	**finance lease v borrow-and-buy a car**: PV of outflows, net advantage of leasing
Jun'24	lessor's minimum rental (wet lease, inflating costs)
Dec'24	**buy (loan schedule) v lease with revenue-share rent**
Jun'25	lessor's rentals in the ratio 2 : 2 : 1 : 1 (= SM Illus. 3 type)
Dec'25	**rental that makes lease = loan** (break-even rental)
Jun'26	deferred and ballooned rentals (= MQP Q2(b) with new numbers)

HOW IT IS ASKED

- **Lessee**: PV of after-tax lease rentals v PV of buying with a loan (instalments − interest shield − depreciation shield − salvage), discounted at the **after-tax cost of debt**.
- **Lessee's break-even rental** (D25): the rental that makes the two equal.
- **Lessor**: minimum rental = (cost − PV of depreciation shield − PV of salvage) ÷ PV factor of after-tax rentals; structured, deferred, ballooned or ratio rentals change only the factor.

A Formula sheet — when to use

Formula	When to use · notes	SM
Discount rate = cost of debt × (1 − tax)	Lease v buy is a financing comparison (Illus. 1: 12 × 0.7 = 8.4%).	[SM 113]
Lease: PV = rental × (1 − t) × PVIFA	Rentals in arrears; in advance → shift one year.	[SM 113]
Buy: PV of instalments − PV of interest shield − PV of depreciation shield (− PV of salvage)	Instalment = loan ÷ PVIFA at the loan rate; interest from the loan schedule.	[SM 113, SM 115]
Lessee BELR: rental × (1 − t) × PVIFA = PV of the buy option	Maximum rental the lessee will pay.	[SM 115]
Lessor BELR: PV of after-tax rentals = cost − PV of depreciation shield − PV of salvage	Minimum rental the lessor can accept.	[SM 115]
Leveraged lease: rental − loan instalment must recover the lessor's equity	Lessor partly financed by a lender.	[SM 117]

B Lease basics 3.1 · 3.3

- **Lease**: the lessor conveys to the lessee the right to use an asset for an agreed period for rentals; a lessee may sub-lease. [SM 111]
- **Finance lease** transfers substantially all risks and rewards of ownership; **operating lease** does not — "operating lease is merely a rental, financial lease is a disguised purchase". [SM 111]
- **To the lessor**: full security (owner, can repossess), tax relief by depreciation, high profits, trading on equity. [SM 111]
- **To the lessee**: source of finance; no dilution of ownership; no loss of control (no lender's conditions); tax benefit (whole rental expensed); less risk (obsolescence with the lessor); **sale and leaseback** to raise cash. [SM 112]
- 3.3: **cross-border leasing** and **sale and lease back** — read the headings (PTP Q8(c)). [SM 122–123]

C Lease v buy and break-even rentals · Q2(b) 3.1 · 3.2

PROBLEMS BOX · LEASING (Q2(b) — RECOMPUTED BY SCRIPT m03_patterns.py)

WORKED PATTERN · SM ILLUSTRATION 1 (EXCEL TRANSPORT, LEASE V BUY)

- Truck ₹3,00,000; loan 12% in 4 equal instalments; or lease ₹90,000 a year; SLM; tax 30%. Rate 12(1 − 0.3) = 8.4%.
- Lease: 90,000 × (1 − 0.3) × 3.28 = **₹2,06,640**. [SM 113]

Buy option	₹
Instalment 3,00,000 ÷ 3.037 = 98,782; PV 98,782 × 3.2828	3,24,282
Less: PV of interest tax shield (interest 36,000 · 28,466 · 20,028 · 10,634)	24,258
Less: PV of depreciation tax shield (75,000 × 30% = 22,500 a year)	73,864
PV of buying → lease is cheaper	**2,26,160**

[SM 113–114] The last year's interest (10,634) is the balancing figure: instalment − closing principal.

LESSEE'S BREAK-EVEN RENTAL · SM ILLUSTRATION 2

X × (1 − 0.30) × 3.2828 = 2,26,160 → **X = 98,417**, the most the lessee will pay. [SM 116]

LESSOR'S STRUCTURED RENTALS · SM ILLUSTRATION 3 (4 : 3 : 2 : 1)

Cost ₹6 crores, SLM 4 years, tax 30%, 10% → 7.0%: depreciation shield ₹1.5 crores × 0.30 × 3.387 = ₹1.52415 crores; 6.1278X = 6,00,00,000 − 1,52,41,500 → **X = 73,04,171**; rentals ₹2,92,16,684, ₹2,19,12,513, ₹1,46,08,342, ₹73,04,171. [SM 116–117]

DEC'25 Q2(b) GAMMA — RENTAL THAT EQUALS THE LOAN (OUR WORKING)

- Loan ₹80,000 at 12%, principal ₹16,000 a year; depreciation ₹16,000 (full cost); tax 35%; after-tax rate 10%.
- Net outflow = principal + interest − 35% × (interest + depreciation): year 1 = 16,000 + 9,600 − 8,960 = **₹16,640**; then 15,392 · 14,144 · 12,896 · 11,648.
- Salvage 4,000 − 10% commission = 3,600, fully depreciated → after tax **₹2,340** inflow in year 5.
- PV of the loan option = **₹53,049.93**; L × 0.65 × 3.790 = 53,049.93 → **rental ₹21,534.37** a year.

STEPS (ANSWER LAYOUT)

1. Discount rate = after-tax cost of debt (or the given after-tax cost of capital).
2. Loan schedule: opening · interest · instalment · principal · closing.
3. Year table: instalment (or principal + interest) − tax on interest − tax on depreciation − salvage after tax = net outflow → PV.
4. Lease: rental × (1 − t) × factor. Compare, or solve for the rental.

PRACTISE THESE (MOST LIKELY FIRST)

D23, D24 Q2(b) (lease v buy — due) · **D25 Q2(b)** · J26 Q2(b) = MQP Q2(b) (deferred / ballooned) · J25, J24 Q2(b) (lessor) · PTP Q2(b) (leveraged), postal Q2(b), Q3(a), Q3(b) · SM Illus. 1–5, Additional illus. (SM 123–131), solved case 1 (SM 133) · SM exercise sums 1–5 (SM 142–144) · **ICMAI Practice Workbook Ch3 illus. 1–10** · MCQ bank Q24, Q26–Q32, Q208–Q211.

Item	Rule	SM
Rate	k_d (1 − t)	[SM 113]
Lessee BELR	= PV of buying	[SM 115]
Lessor BELR	cost − PV dep. shield − PV salvage	[SM 115]

⚠ TRAPS

- The lessee does **not** get the depreciation shield under lease; the lessor does.
- Use the after-tax rate for both options; the instalment itself uses the pre-tax loan rate.
- Rentals in advance: first rental at year 0, no factor; its tax saving comes at year 1.
- Salvage under buy: after commission and after tax on the gain over book value.

Module 8 · Portfolio theory and practice P14 · 8.1–8.3

SM pp. 299–359 (exercise 360–382). **2–11 marks a paper** (expected 6.9): **Q5(b) portfolio risk** in D23, D24, J25 (J24 Q5(a)) — **D23 = J25 = SM 8.3 Illustration 15 with new numbers** (portfolio beta, residual variance, Sharpe single-index v Markowitz variance); J26 Q5(b) holding-period / expected return; **MCQ (vii)** on utility / risk penalty / CML five times.

Paper	Long	MCQ
Jun'23	Q5(a) portfolio as risky as the market: amounts in stock and debentures	–
Dec'23	**Q5(b) portfolio β, residual variance, Sharpe index and Markowitz variance**	risk penalty = variance ÷ tolerance
Jun'24	Q5(a) betas, covariances, total and systematic risk, equal weights	utility = return − variance ÷ tolerance
Dec'24	Q5(b) correlations, 2-stock variance, unsystematic risk	statements on risk penalty
Jun'25	**Q5(b) = D23 template**	risk tolerance from utility · index portfolio = systematic risk
Dec'25	–	risk-free + equity mix with SD 24% (CML)
Jun'26	Q5(b) average / expected return, Treynor per stock (8.3)	–

Formula	When to use	SM
HPR = $(P_1 - P_0 +$ dividend$) \div P_0$	Holding-period return; = current yield + capital appreciation.	[SM 299–300]
$E(R_p) = \Sigma W_i R_i$	Portfolio return.	[SM 300]
$\boldsymbol{\sigma_p^2 = W_1^2\sigma_1^2 + W_2^2\sigma_2^2 + 2W_1W_2Cov_{12}}$; Cov = $\rho\sigma_1\sigma_2$	Two-asset risk; three assets: the 3 × 3 matrix.	[SM 301]
Systematic variance = $\beta^2 \sigma_M^2$; residual = total − systematic	Split of total risk (Sharpe single-index model).	[SM 351]
Single-index $\sigma_p^2 = \beta_p^2\sigma_M^2 + \Sigma W_i^2 \times$ residual$_i$	Portfolio variance by the Sharpe index model.	[SM 351]
Risk penalty = risk² ÷ risk tolerance; utility = $E(R_p)$ − penalty	MCQ (vii).	[SM 320]
$S_p = [E(r_p) - r_f] \div \sigma_p$	Optimal risky portfolio maximises this slope (CAL).	[SM 320]

B Portfolio risk · Q5(b)

- **Markowitz** (1952): first scientific approach to risk, return and covariance of a portfolio. [SM 299]
- The expected return of a portfolio is always the weighted average of its holdings' returns; its risk is not (covariance). [SM 301]
- **Systematic risk**: external, market-wide (market, interest-rate, purchasing-power risk) — not diversifiable. **Unsystematic**: the residual = total − systematic; removed by diversification. [SM 301, SM 303]
- An index-like portfolio carries only systematic risk (J25 MCQ). (past MCQ)
- Utility example: return 16%, variance 289, tolerance 60 → penalty 289% ÷ 60 = 4.82%; utility 16% − 4.82% = 11.18%. [SM 320]

PROBLEMS BOX · PORTFOLIO VARIANCE (RECOMPUTED BY SCRIPT m08_patterns.py)

WORKED PATTERN · SM 8.3 ILLUSTRATION 15 (= D23, J25 Q5(b) TEMPLATE)

Share	W	β	Total var.	$\beta^2\sigma_M^2$	Residual
A	0.20	0.40	0.015	0.0016	0.0134
B	0.50	0.50	0.025	0.0025	0.0225
C	0.30	1.10	0.100	0.0121	0.0879

- σ_M = 10%. Portfolio beta 0.08 + 0.25 + 0.33 = **0.66**.
- Sharpe index: $(0.10)^2 \times (0.66)^2$ = 0.0044 + $\Sigma W^2 \times$ residual 0.0140 = **0.0184**.
- Markowitz (Cov AB 0.030, AC 0.020, BC 0.040): **0.0363**. [SM 350–352]

JUN'25 Q5(b) KETON (OUR WORKING)

- Weights 0.35 / 0.25 / 0.40, betas 0.35 / 1.25 / 0.80, σ_M 12%: portfolio β = **0.7550**.
- Residual variances: ASL 0.015 − 0.0018 = **0.0132**; NSL 0.035 − 0.0225 = **0.0125**; ZNL 0.020 − 0.0092 = **0.0108**.
- Markowitz variance (Cov 0.025, 0.060, 0.035) = **0.0334**.

1 · Portfolio beta
Σ weight × beta

↓

2 · Residual variance per share
total − $\beta^2 \times \sigma_M^2$

↓

3 · Sharpe index model
$\beta_p^2\sigma_M^2$ + Σ W^2 × residual

↓

4 · Markowitz
Σ $W^2\sigma^2$ + 2 Σ $W_iW_jCov_{ij}$ (matrix)

PRACTISE THESE (MOST LIKELY FIRST)

D23, J25 Q5(b) · D24 Q5(b), J24 Q5(a), J23 Q5(a) · J26 Q5(b) (8.3) · MCQs D23 Q1(iii), J24 Q1(iii), D24 Q1(ix), J25 Q1(viii), (xv), D25 Q1(vii), PTP Q1(vii) · postal Q4(a), Q7(b) · SM Illus. 1–11, 8.3 Illustrations 1–16 (SM 328–359) · SM exercise MCQs (SM 360–375) · **ICMAI Practice Workbook Ch6 illus. 6, 7, 8, 9, 11, 12** · MCQ bank Q18, Q89–Q95, Q193, Q194, Q196, Q197, Q204.

⚠ **Traps**: residual uses the **market** variance × β^2, not the share's SD; the Sharpe index model ignores the covariances given (they are for Markowitz); square the weights in both models; keep 4 decimals as the question asks.

Module 16 · Foreign exchange risk management P14 · 16.1–16.3

SM pp. 685–707 (exercise 708–716). **7–16 marks every paper** (expected 6.6): **Q7(b) — a hedging-choice sum in every paper since Dec'23** (forward v money market v option, sometimes futures or no hedge). Translation (16.2) and operating exposure (16.3): never asked — read the headings.

Paper	Hedging sum
Jun'23	USD import: pay with a loan or take supplier credit; CAD payables: forward v option
Dec'23	Q7(b) export receivable: forward v currency futures v no hedge
Jun'24	yen payable: forward v option; invoicing currency for an export and an import
Dec'24	Q7(a) net EUR exposure: forward v money market v option
Jun'25	USD payable: forward v call option v EUR cross route
Dec'25	**Q7(b) USD payable: forward v money market v option (two scenarios)**
Jun'26	Q7(b) yen payable and USD receivable: forward v money market

Hedge	Payable (you must buy FC)	Receivable (you will sell FC)
Forward	buy FC forward at the forward **ask**	sell FC forward at the forward **bid**
Money market	invest PV of FC now (FC rate); buy it spot with home currency borrowed (home rate); repay loan + interest	borrow PV of FC now (FC rate); sell spot; invest the home currency (home rate)
Option	buy a **call**: exercise if spot > strike; cost = min(spot, strike) + premium	buy a **put**: exercise if spot < strike
Futures	buy futures (long)	sell futures (short); contracts = exposure ÷ contract size

Forward / money market / options / futures as external techniques. [SM 687–691]

A Transaction exposure and the hedges 16.1

- **Transaction exposure**: effect of exchange-rate movement in the time gap between the transaction date and the settlement date. [SM 685]
- **Internal techniques**: choice of invoicing currency; leading and lagging; exposure netting (bilateral, multilateral); back-to-back credit swap; sharing risk. [SM 686–687]
- **Invoicing**: foreign currency appreciating → invoice exports in foreign currency, imports in home currency; depreciating → the reverse (J24 Q7(b), postal MCQ). [SM 686]
- **External techniques**: currency forwards, money market, currency options, currency futures. [SM 687]
- Options limit the downside loss without limiting the upside — the advantage over forwards and futures. [SM 690]
- **Translation exposure** (16.2): current / non-current, monetary / non-monetary, temporal, current-rate methods; balance-sheet hedge. **Operating exposure** (16.3): diversify production and markets, currency zones, sourcing flexibility, flexible manufacturing, diversified financing. [SM 693–696]

PROBLEMS BOX · HEDGING CHOICE (Q7(b) — RECOMPUTED BY SCRIPT m16_patterns.py)

WORKED PATTERN · SM MONEY-MARKET EXAMPLE (FRENCH EXPORTER, £1 MILLION)

- Borrow £ so that it grows to £1 million: B = £1/1.02 = £0.98039 million (8% for 3 months).
- Sell spot at €1.4120/£ → €1.3843 million; invest at 5.5% → **€1.4033 million** certain. [SM 689]

OPTION · SM EXAMPLE (GERMAN IMPORTER, $10 MILLION)

- Call at $1.19/€, premium 2.5%: €0.025 × 10/1.20 = €0.2083 million.
- Exercise (spot $1.175): €10/1.19 = €8.4034 + €0.2083 = 8.6117; lapse (spot $1.21): €8.2645 + €0.2083 = **€8.4728 million**. [SM 690–691]

DEC'25 Q7(b) MEDCARE — USD 8 MILLION PAYABLE (OUR WORKING)

- Forward: 8m × 84.50 = **₹67.60 crore**.
- Money market: invest 8m ÷ 1.015 = $78,81,773 now; buy at 83.70 = ₹65.97 crore borrowed at 8% for 6 months → **₹68.61 crore**.
- Option (call 84, premium ₹1.20): at 82.50 lapse → ₹66.96 crore; at 86 exercise → ₹68.16 crore; expected (0.4 / 0.6) **₹67.68 crore**.

Q7(b) answer layout
(i) forward: amount × forward rate

↓

(ii) money market: PV in FC → spot → borrow / invest at home rate → future value

↓

(iii) option: each scenario (exercise or lapse) + premium → expected

↓

(iv) compare; the **lowest certain** outflow (or highest inflow) wins

- Lowest **certain** cost: the **forward** (₹67.60 crore).

PRACTISE THESE (MOST LIKELY FIRST)

D25, J26 Q7(b) · D24 Q7(a) · J25 Q7(a) · J24 Q7(a), Q7(b) (invoicing) · D23 Q7(b) (futures) · J23 Q7(a), Q7(b) · MQP Q7(b) · postal Q1(viii) · SM exercise sums 2–5 (SM 711–712) and MCQs (SM 708, SM 710) · **ICMAI Practice Workbook Ch9 illus. 10**.

⚠ SM SLIPS AND TRAPS

- SM 688 forward example: the question says $6,00,000, the working uses $5,00,000 (₹32 million at ₹64). SM 690–691 option example prints "€08.6117" and then "€8.6167" — 8.4034 + 0.2083 = **€8.6117 million**.
- Money market for a payable: **invest** in the foreign currency; for a receivable: **borrow** in it. Use rates for the period (8% × 6/12).
- Option premium is paid up front — add it to every scenario (ICMAI usually ignores interest on it unless told).
- "Lowest certain cost" — compare forward and money market; the option's expected cost is not certain.

Module 14 · International financial environment P14 · 14.1 · 14.2

SM pp. 617–629 (exercise 630–634). **5–7 marks every paper since Dec'23** (expected 6.5): **Q8(b) a 5-mark note** — GDR / ADR / foreign bonds four times (J24, J25, D25, J26), **World Bank / IMF in both D23 and D24** (December papers) — plus **MCQ (xii)** (GDR features, Euro notes). One sum in the SM (GDR issue), never examined.

Paper	Q8(b) note	MCQ
Dec'23	**major initiatives of the World Bank**	–
Jun'24	features of GDRs	–
Dec'24	**IMF lending schemes**	–
Jun'25	types of foreign bonds	–
Dec'25	key features of GDRs (= J24)	features of GDRs
Jun'26	ADR: concept and advantages	unsecured short / medium-term FC debt = Euro notes

WHAT IS DUE FOR DEC'26 (PREDICTION)

- The December habit: **World Bank / IMF** (D23, D24; MQP Q8(b)). The SM gives only the institutions — learn the IBRD / IDA / IFC / MIGA / ICSID list and the IMF's functions; the scheme lists below are marked ⚠.
- Repeatable: GDR features, ADR advantages / limitations, foreign bonds; not yet asked: FCCB benefits / limitations, Euro notes (CP, NIF, MTN), sponsored v unsponsored DRs.

A International financial institutions · Q8(b) 14.1

- **Bretton Woods** (July 1944): IMF and World Bank. **IMF** — international monetary cooperation, exchange-rate stability, orderly exchange arrangements; 44 countries at the conference; 24-member Executive Board; resources from member **quotas**. [SM 617–618]
- **IMF's three functions**: overseeing economic development, **lending**, capacity development. Lending: General Resources Account on non-concessional terms to all members; concessional support through the Poverty Reduction and Growth Trust. [SM 618]
- **World Bank** (two institutions): **IBRD** — lends to governments of middle-income and creditworthy low-income countries; **IDA** — interest-free credits and grants to the poorest countries. [SM 618]
- **World Bank Group** adds: **IFC** (private sector), **MIGA** (created 1988; guarantees to promote FDI in developing countries), **ICSID** (conciliation and arbitration of investment disputes). Medium- and long-term infrastructure loans; government guarantee needed. [SM 618–619]
- Also: regional development banks, national development banks, other regional institutions. [SM 619–620]

⚠ NOT IN THE SM — D24 Q8(b) IMF LENDING SCHEMES

From the IMF's own facility list (verify before relying on it): **non-concessional** — Stand-By Arrangement (SBA), Extended Fund Facility (EFF), Flexible Credit Line (FCL), Precautionary and Liquidity Line (PLL), Rapid Financing Instrument (RFI); **concessional (PRGT)** — Extended Credit Facility (ECF), Standby Credit Facility (SCF), Rapid Credit Facility (RCF); **Resilience and Sustainability Facility** (RSF). Open with the SM's lines on the GRA and PRGT.

⚠ NOT IN THE SM — D23 Q8(b) WORLD BANK INITIATIVES

The SM has no list of "initiatives". Build the answer from the SM's five institutions and their roles (above), then add, with ⚠: poverty reduction and shared prosperity (twin goals), infrastructure and IDA financing for the poorest, private-sector support through IFC / MIGA, dispute settlement through ICSID, BoP-support lending tied to growth-oriented policies (SM 619).

B Sources of foreign currency · Q8(b) and MCQ (xii) 14.2

MODEL ANSWER · FEATURES OF GDRs (J24, D25)

a. **Underlying shares** — each GDR represents one or more shares held by the custodian of the depository bank.
b. **Entry in company's books** — the depository bank is shown as the holder.
c. **Returns** — dividends paid in local currency to the depository, converted into dollars for the holders.
d. **Negotiable** — exchangeable for the underlying shares at any time or after a period, generally **45 Days**.
e. **Globally marketed** — traded in more than one country.
f. **Settlement** — through CEDEL and Euro-Clear.

Impact on Indian markets: investors track world events (arbitrage), free pricing, foreign investment inflow. [SM 628]

MODEL ANSWER · ADR: CONCEPT AND ADVANTAGES (J26)

A depository receipt issued in the US against a foreign company's shares held by a custodian; sponsored (Level I, II, III, 144A) or unsponsored. **Advantages**: (i) access to large capital; (ii) access to foreign exchange; (iii) no change in shareholding / voting pattern; (iv) international recognition; (v) no exchange-rate risk (dividends paid in rupees). **Limitations**: high issue cost; large issue size; stringent compliance. [SM 625–627]

MODEL ANSWER · TYPES OF FOREIGN BONDS (J25)

a. **Yankee bonds** — US-dollar issues by foreign borrowers in the US market.
b. **Samurai bonds** — non-Japanese borrowers in the domestic Japanese market (minimum investment grade).
c. **Bulldog bonds** — sterling foreign bonds in the UK market.
d. **Shibosai bonds** — privately placed bonds in Japan; less stringent criteria.

[SM 622]

- **Eurobonds**: outside the regulation of the country of the currency of denomination. [SM 621]
- **FCCB** benefits: lower coupon; debt falls on conversion; investors get a fixed minimum return plus upside. Limitations: weak demand in a falling market; dilution of EPS; adverse exchange moves; credit risk; no control over conversion terms. [SM 622]
- **Euro notes** (J26 MCQ): commercial paper (short-term unsecured), note issuance facilities (up to one year), medium-term notes (over one year). [SM 623]
- Euro-convertible bonds (call / put options), Euro-convertible zero bonds, Euro-bonds with equity warrants, syndicated credits. [SM 623–624]
- GDR issue (SM Illus. 1, recomputed by m14_patterns.py): net $20 million, cost 2% → gross $20.408 million; GDR = 2 shares × ₹500 × 90% = ₹900 = $12.50 → **1.63264 million GDRs**; cost = 40 ÷ 882 + 0.10 = **14.54%**. [SM 628–629]

Practise these: Q8(b) D23, J24, D24, J25, D25, J26 · MQP Q8(b) · MCQs D25, J26 Q1(xii), MQP Q1(xii) · SM exercise (SM 630–634) · ICMAI Practice Workbook: no problem on this module.

Module 10 · Portfolio performance evaluation P14 · 10.1 · 10.2

SM pp. 419–436 (exercise 437–444). **A long question in every paper** (expected 6.4) — in Q4(b) or Q5: ranking by **Sharpe, Treynor, Jensen** (J23, J24, D25 = SM Illus. 7 template, J26), reverse questions (D23: beta and R_f from Jensen and Treynor) — plus MCQs (D24, J25: Sharpe ratio; correlation or market SD from the two ratios). 10.2 market timing / style analysis: headings only.

Paper	Long question
Jun'23	Q5(b) rank three MFs by Sharpe and by Treynor
Dec'23	Q5(a) from Jensen alpha and Treynor: beta, R_f, SML
Jun'24	Q4(b) four funds: Sharpe, Treynor (beta from systematic risk)
Dec'25	**Q5(b) three funds: Sharpe, Treynor, Jensen ($\beta = \rho\sigma \div \sigma_M$)**
Jun'26	Q4(b) fund returns from NAVs; Sharpe and Treynor

Formula	When to use	SM
Sharpe = $(R_i - R_f) \div \sigma_i$	Reward per unit of **total** risk; poorly diversified portfolio.	[SM 428]
Treynor = $(R_i - R_f) \div \beta_i$	Reward per unit of **systematic** risk; well-diversified portfolio.	[SM 424, SM 428]
Jensen α = $R_p - [R_f + \beta_p(R_m - R_f)]$	Absolute out- / under-performance against CAPM.	[SM 425]
MWROR: IRR equating the fund's opening value and net cash flows with its end value	Money-weighted return (affected by timing of contributions); TWROR removes it.	[SM 419–420]

ANSWER LAYOUT (ICMAI TABLE)

- Columns: Fund · R · σ · β · R − R_f · Sharpe · rank · Treynor · rank · CAPM return · Jensen α · rank. Include the market as a row when it is given.
- Beta not given: $\beta = \rho \times \sigma_{fund} \div \sigma_{market}$, or from systematic risk: $\beta = \sqrt{(\text{systematic variance})} \div \sigma_M$.
- Reverse questions: Treynor = $(R - R_f) \div \beta$ and $\alpha = R - R_f - \beta(R_m - R_f)$ are two equations — solve for β and R_f.
- MCQ: Sharpe ÷ Treynor = $\beta \div \sigma = \rho \div \sigma_M$ → correlation or market SD.
- Ranks can differ: Sharpe penalises unsystematic risk, Treynor does not.

PROBLEMS BOX · RANKING FUNDS (RECOMPUTED BY SCRIPT m10_patterns.py)

WORKED PATTERN · SM ILLUSTRATION 7 (SIX FUNDS, R_f 6%, R_m 15%)

Fund	R	σ	β	Sharpe	Rk	Treynor	Rk	Jensen	Rk
P	18.5	24.05	1.2	0.5198	4	10.4167	2	1.7	2
Q	16.3	22.37	1.1	0.4604	5	9.3636	4	0.4	4
R	9.0	14.59	0.9	0.2056	7	3.3333	7	-5.1	7
S	21.25	28.10	1.3	0.5427	3	11.7308	1	3.55	1
T	16.80	19.58	1.05	0.5516	2	10.2857	3	1.35	3
U	12.25	16.00	0.8	0.3906	6	7.8125	6	-0.95	6
Market	15.00	13.40	1	0.6716	1	9	5	0	5

[SM 426–428]

SM ILLUSTRATIONS 5 AND 6

Treynor: return 40%, β 1.2, R_f 8% → 32 ÷ 1.2 = 26.67% v market 25%; CAPM 8 + (25 − 8) × 1.2 = 28.4% → outperformed by 11.6%. [SM 424]

Jensen: R_m 12%, R_f 6%: portfolio 1 14.5 − 13.2 = +1.30%; 2: 9.5 − 10.8 = −1.30%; 3: 18.0 − 14.4 = +3.60% (best). [SM 427]

DEC'25 Q5(b) TAMIA (OUR WORKING; R_f 9%, R_m 14%, σ_M 1.20)

Fund	Sharpe	Rk	β = ρσ ÷ 1.20	Treynor	Rk	Jensen	Rk
ROX	10 ÷ 2.50 = 4.00	1	1.75	5.7143	1	+1.25	1
SEZ	4.5 ÷ 2.00 = 2.25	3	0.90	5.0000	2	0.00	2
TOM	2 ÷ 0.80 = 2.50	2	0.65	3.0769	3	−1.25	3

Jensen: ROX 19 − (9 + 1.75 × 5) = +1.25; SEZ 13.5 − (9 + 0.90 × 5) = 0; TOM 11 − (9 + 0.65 × 5) = −1.25.

PRACTISE THESE (MOST LIKELY FIRST)

D25 Q5(b), J26 Q4(b), J24 Q4(b) · D23 Q5(a) (reverse) · J23 Q5(b) · MQP Q5(b), Q1(vii) · PTP Q4(b), Q5(b) · postal Q6(a) · MCQs D24 Q1(iv), (xiii), J25 Q1(iii), (xi) · SM Illus. 1–8 (SM 420–428), exercise MCQs 4–5 (SM 441) · MCQ bank Q104–Q109 · also M7 (fund NAV) for Q4(b).

⚠ **Traps**: use excess return ($R - R_f$) in both ratios; rank the **highest** ratio first; negative Jensen = under-performed; compute β before Treynor when only ρ is given.

Module 4 · Securitization P14 · 4.1–4.4

SM pp. 147–155 (exercise 156–162). **4–6 marks every paper** (expected 5.6): **Q8(c) a 4-mark list in all 6 papers** + **MCQ (iv)** (D25, J26). Four SM lists cover every question; two have already repeated (parties D23 = J26; SPV securities J24 = D25). **Not yet repeated: limitations** (D24 only) and reasons / benefits (J25). No sums.

Paper	Q8(c) / long	MCQ
Jun'23	Q2(b) features of securitisation (6)	–
Dec'23 · Jun'26	**participants / parties** (also MQP Q8(c))	J26: role of the SPV · MQP: who is not a party
Jun'24 · Dec'25	**securities issued by the SPV**	J24: a debt-market instrument · D25: issued by a subsidiary = preferred stock certificates
Dec'24	**limitations**	–
Jun'25	why financial institutions securitise (benefits)	PTP: multiple-maturity certificate = pay-through

4.1 · MEANING AND BENEFITS (J23, J25)

Securitization: certain assets are pooled and repackaged into interest-bearing securities; the interest and principal from the assets pass to the purchasers of the securities. Illiquid assets → securities backed by them. [SM 147]

Why banks securitise: **(a) funding** — support rapid asset growth, diversify the funding mix and reduce its cost, reduce maturity mismatches; **(b) balance-sheet capital management** — regulatory and economic capital relief; **(c) risk management and credit-risk transfer** — assets sold to the SPV. **For investors**: diversification into sectors not in the regular bond market; different (sometimes superior) risk-reward; access to otherwise closed sectors. [SM 148–149]

4.2 · PARTICIPANTS (D23, J26, MQP)

a. **Originator** — creates / owns the receivables (e.g. a bank).
b. **Arranger** — designs and sets up the structure.
c. **Special purpose vehicle** — buys the assets for off-balance-sheet treatment; issues the securities.
d. **Investors** — institutions, insurers, pension and hedge funds, companies, HNIs.
e. **Servicers** — collect the receivables as SPV's agent for a fee.
f. **Rating agencies** — rate the SPV's capacity to pay.
g. **Enhancement providers** — credit enhancement for liquidity, marketability, safety.
h. **Regulators** — accounting, capital adequacy, SPV structure.

[SM 150]

4.3 · LIMITATIONS (D24 — DUE)

a. **Costly** in practice, especially in emerging markets.
b. **High initial cost** of the SPV → a minimum economic size.
c. **Asset-liability mismatch** passes to investors (pass-through repayment pattern).
d. **High disclosure** to regulators, servicers, trustees, rating agencies.
e. Only **better-quality receivables** can be securitised.
f. **No flexibility to restructure** debts — trustees have no discretion.
g. **Upfront booking of profits**, including estimated future profits.

[SM 153]

Mechanism (12 steps, short form): originator selects receivables → SPV formed → SPV acquires them → SPV issues securities (Class A, B, C = senior, mezzanine, junior) → servicer appointed (normally the originator) → obligors notified if required → servicer collects (escrow) and pays the SPV → SPV pays investors → defaults: losses in reverse order of seniority → clean-up by buy-back → originator's residual profit. [SM 152–153]

4.4 · SECURITIES ISSUED BY THE SPV (J24, D25)

a. **Pass-through certificates** — investors paid as and when the assets pay.
b. **Pay-through certificates** — multiple maturities; SPV reinvests to bridge gaps.
c. **Preferred stock certificates** — issued by a subsidiary against the parent's trade debts and consumer receivables.
d. **Asset-backed commercial paper** — SPV buys mortgage portfolios from several lenders.
e. **Interest-only certificates** and **principal-only certificates** (speculative).

Also ABS, MBS, CDOs (CBO, CLO, CRE CDO). [SM 154–155]

Practise these: Q8(c) D23, J24, D24, J25, D25, J26 · J23 Q2(b) · MQP Q8(c), Q1(iv) · PTP MCQ · MCQs J24 Q1(xiii), D25 Q1(iv), J26 Q1(iv) · SM exercise (SM 156–162) · ICMAI Practice Workbook: no problem on this module.

Module 7 · Mutual funds P14 · 7.1–7.5

SM pp. 237–286 (exercise 287–298). **0–10 marks a paper** (expected 5.1): **Q4(b) a NAV sum in every December** (D23, D24, D25), investor-return sums in June (J23 = J25 template: units, NAV, yield, days held); MCQs on NAV, entry load. 7.1 / 7.2 / 7.5 (structure, regulation, ETFs, REITs, InvITs): never asked. **MQP Q4(b)** (NAV with loads and dividend equalisation) is unused — practise it.

Formula	When to use	SM
NAV per unit = net asset value of the fund ÷ units outstanding	Every NAV sum.	[SM 254]
Net assets = market value of investments + receivables + accrued income + other assets − accrued expenses − payables − other liabilities	Build the fund's balance sheet at market value; unlisted / non-traded securities at estimated value.	[SM 254–255]
Return = (change in NAV + dividend + capital-gains distribution) ÷ opening NAV	Holding-period return; annualise ÷ years (SM Illus. 3, SM 256).	[SM 255]
Sector value at valuation = cost × index now ÷ index at purchase	December template (D23, D25).	exam

ANSWER LAYOUT

1. Revalue each holding (sector index ratio, market price, bonds at value) → total investments.
2. + cash, receivables, accrued income − expenses payable, liabilities = **net assets**.
3. ÷ units outstanding = **NAV per unit** (opening NAV = amount raised ÷ units).
4. Return = (closing NAV − opening NAV + dividends) ÷ opening NAV; annualise by the years held.
5. Investor sums: units = amount ÷ (NAV + entry load); yield = (gain + dividends) ÷ amount; days held from the yield given.

⚠ **Traps**: opening NAV uses the amount invested (no cash at purchase); dividends paid are added back to the return; expenses payable are deducted; units outstanding, not face value.

PROBLEMS BOX · NAV AND FUND RETURN (Q4(b) — RECOMPUTED BY SCRIPT m07_patterns.py)

WORKED PATTERN · SM ILLUSTRATIONS 1, 2, 4

- Illus. 1: fund ₹300 crore, face value ₹10; investments ₹360 crore + receivables 6 + accrued income 4 − liabilities 2 − accrued expenses 1 = 367 ÷ 30 crore units = **₹12.23 per unit**. [SM 255]
- Illus. 2: NAV ₹50 → ₹55, dividend ₹4, capital gains ₹3: (5 + 4 + 3) ÷ 50 = **24%**; year II (50 − 55 + 5) ÷ 50 = 0%. [SM 255]
- Illus. 4: (180 + 1 + 1 − 0.50 − 0.50) lakhs ÷ 10 lakhs units = **₹18.1 per unit**. [SM 257] (⚠ the SM writes "18.1 lakhs" — it is ₹18.10 per unit.)

PRACTISE THESE (MOST LIKELY FIRST)

D25, D23 Q4(b) (NAV) · **MQP Q4(b)** (loads, dividend equalisation — unused) · D24 Q4(b) (fund beta, NAV after a 10% fall) · J25, J23 Q4(b) (investor return, days held) · postal Q6(b) · MCQs D23 Q1(iv), J24 Q1(v), D24 Q1(xii), J23 Q1(ix) · SM Illus. 1–8, 7.5 examples (SM 279–280, entry load) · **ICMAI Practice Workbook Ch5 illus. 1–14** · MCQ bank Q75, Q79, Q83, Q85, Q87, Q182–Q186, Q199, Q202, Q203, Q206, Q234, Q239.

DEC'25 Q4(b) — RETURN (OUR WORKING, CONT.)

Opening NAV = 125 ÷ 7 = ₹17.8571; return = (27.5920 − 17.8571 + 2 × 3.00) ÷ 17.8571 = **88.1%** over 2 years → **44.06% a year** (simple).

DEC'25 Q4(b) WEALTH PLUS (OUR WORKING)

Holding (₹ crore)	Cost	Index	Value
IT and ITES	35	3100 / 1800	60.2778
Infrastructure	20	2550 / 1500	34.0000
Aviation / transport	10	2300 / 1400	16.4286
Automotive	25	2800 / 1750	40.0000
Banking / financial	15	2500 / 1600	23.4375
Unlisted bonds (⚠ no coupon given: at cost — state it)	20		20.0000
+ cash 4 − expenses payable 5			(1.0000)
Net assets → ÷ 7 crore units			**193.1438 → ₹27.5920**

Module 5 · Security analysis P14 · 5.1 · 5.2

SM pp. 163–190 (exercise 191–200). **MCQs only: 2–4 marks a paper** (expected 2.5) — **MCQ (v) technical analysis in 5 of 6 papers** (stochastic %K twice, RSI, relative strength, moving-average signal, definition); fundamental analysis once (D23: Porter's entry barriers).

Paper	MCQ
Dec'23	Porter: not an entry barrier (5.1)
Dec'24	definition of technical analysis · stochastic %K over 100 days
Jun'25	moving-average buy signal · relative strength from closing prices
Dec'25	stochastic %K (= D24 with new numbers)
Jun'26	RSI from six prices
MQP	EMA exponent 0.067 → number of periods (the formula is not in the SM text; learn it from the MQP answer)

- **Basis of technical analysis**: price discounts everything; price movements are not totally random; "what" matters more than "why". [SM 179–180]
- **Four points of view**: prices, time, volume, width (breadth across sectors). [SM 180]
- Tools: Dow theory, charts (line, bar, point and figure, candlestick), patterns (V formation, tops and bottoms, head and shoulders; reversal v continuation), Elliott wave theory. [SM 181–188]
- **RSI** (Wells Wilder) = 100 − 100 ÷ (1 + RS); RS = average gain per day ÷ average loss per day; usually 5, 7, 9 or 14 days. [SM 189]
- **Stochastic** (George C Lane): %K and %D between 0 and 100; %D lags %K (three-day moving average of slow %K). Overbought above 70, oversold below 30; best buy below 15, best sell above 85. [SM 189–190]

MCQ PATTERNS (RECOMPUTED BY SCRIPT m05_patterns.py)

DEC'25 Q1(v) STOCHASTIC %K (OUR WORKING)

⚠ %K = (close − lowest low) ÷ (highest high − lowest low) × 100 — the SM describes %K but its formula is not in the text layer. (210 − 200) ÷ (240 − 200) × 100 = **25%** (option A).

JUN'26 Q1(v) RSI (OUR WORKING)

Changes +6, +22, −2, +3, −11 → gains 31, losses 13; RS = 31 ÷ 13 = 2.38 → RSI = 100 − 100 ÷ 3.38 = **70.41** (option A; unrounded 70.45).

FUNDAMENTAL ANALYSIS (5.1) — HEADINGS

Economy → industry → company analysis (E-I-C); leading / coincident / lagging indicators; diffusion index (postal); Porter's five forces (D23); valuation by book value, P/E, sustainable growth = retention × ROE.

PRACTISE THESE

D24, D25 Q1(xiv)/(v) (%K) · J26 Q1(v) (RSI) · J25 Q1(vi), (xiii) · D24 Q1(v) · D23 Q1(xi) · MQP Q1(v) (EMA) · postal MCQ (diffusion index) · SM exercise (SM 191–200) · MCQ bank (Module 5 set).

⚠ **Traps**: RSI uses **average gain ÷ average loss** (totals over the same number of days give the same RS); %K uses the period's lowest low and highest high, not the opening price.

Module 12 · Risks in financial markets P14 · 12.1–12.4

SM pp. 465–473 (exercise 474–478). **MCQ (ix) only** (expected 1.2): J23 not a part of market risk (downgrade risk) · D25 downgrade risk · J26 responses to risk (avoidance, transfer). No sums.

- **Risk v uncertainty**: not synonymous — risk = several possible outcomes with known probabilities. [SM 465]
- **Types (CIMA 2005)**: operational, financial, country, environmental (PESTEL), reputational, strategic; by diversification: **systematic** (non-diversifiable, macroeconomic) and **unsystematic** (firm-specific, avoidable). [SM 466]
- **Risk-management process**: setting objectives → identification → measurement and prioritisation → development of strategy → implementation → monitoring. [SM 467–468]
- **Strategies (J26 MCQ)**: **avoidance** (halt the activity), **reduction** (internal controls), **sharing or transfer** (insurance, outsourcing, hedging), **acceptance** (no action). [SM 468]
- **Market risk**: equity, interest-rate, inflation-rate, commodities, currency risk. [SM 469–470]
- **Credit risk**: **default** risk, **credit spread** risk, **downgrade** risk (rating lowered) — downgrade is credit risk, **not** market risk (J23, D25 MCQs); also concentration risk and country risk (transfer / conversion, sovereign). [SM 471]
- **Liquidity risk**: funding and market liquidity risk, and their links with other risks. [SM 472]

Practise these: MCQs J23 Q1(x), D25 Q1(ix), J26 Q1(ix) · MQP / PTP Q1(ix) · SM solved case (SM 473), exercise (SM 474–478) · MCQ bank (Module 12 set).

Module 11 · Efficient market hypothesis P14 · 11.1–11.3

SM pp. 445–455 (exercise 456–464). **MCQ only**: one a paper D23 → J25, none in D25 / J26 (expected 0.9). D23 insider cannot profit = strong form · J24 public information in prices = semi-strong · D24 event study tests the semi-strong form · J25 true for all three forms.

- **Weak form**: each share price reflects all information in **past share prices** (and trading data) — technical analysis cannot earn excess returns. [SM 449]
- **Semi-strong form**: prices reflect past prices **and all publicly available information**; tested by the speed of price adjustment to public news — **event studies** (stock splits: Fama, Fisher, Jensen and Roll, 1969). [SM 449–450]
- **Strong form**: all information, public or **private**, is in the price — not even insiders can earn above-average returns. [SM 449, SM 453]
- Semi-strong anomalies in the SM: exchange listing, low P/E stocks (Basu, 1977), the size effect (Banz, 1981). [SM 451–452]
- An efficient market: a new fair value (say ₹205) is reflected at once; in an inefficient one it adjusts slowly as brokers spread the news. [SM 446]

Practise these: MCQs D23 Q1(v), J24 Q1(ix), D24 Q1(xv), J25 Q1(xii) · SM exercise (SM 456–464) · MCQ bank (Module 11 set).