Skillshort

Self-Study Preparation Pack

CA INTERMEDIATE

Paper 4: Cost and Management Accounting

Chapter-wise Detailed Notes

For January 2027 attempt · ICAI BoS study material (new scheme, 15 chapters) + RTP January 2027 · Every worked example verified in Python

100 marks · 3 hours | 30 MCQ + 70 descriptive | Q1 compulsory + any 4 of 5 | ≈ 80% numerical

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This subject pack has 6 parts

1 Chapter-wise notes

2 Important topics & weightage

3 Past papers: trends & links

4 Mock tests + solutions

5 Chapter practice questions

6 Last-week plan & strategy

Prepared by Skillshort for self-study. Original explanations and questions; not an official ICAI/ICMAI/ICSI publication. Items marked VERIFY should be checked against the latest official material.

How to use these notes

These notes follow the **ICAI new-scheme study material** (15 chapters in four sections). Each chapter gives the concepts examiners ask as theory, every **formula** in ICAI notation, a **worked example** (all figures checked in Python) and the common traps. Paper 4 is about **80% numerical** – after each chapter, solve the related practice set and one past-paper question.

File	Use it for
01 Chapter Notes (this file)	Concept building, formulas and first revision
02 Important Topics & Weightage	What to study first; frequency across 4 recent attempts
03 Past Papers – Trend Analysis & Links	How ICAI asks; official download links
04 Mock Tests 1–2 with Solutions	Full 3-hour practice in the exam pattern
05 Chapter-wise Practice Questions	MCQs + descriptive practice after each chapter
06 Last-Week Plan & Exam Strategy	Final revision and exam-day plan

Paper at a glance

Item	Detail
Marks / time	100 marks, 3 hours (+15 minutes advance reading 1:45–2:00 pm)
Part I – MCQs (30 marks)	15 MCQs × 2 marks: usually two case scenarios of 5 MCQs each + 5 independent numerical MCQs
Part II – Descriptive (70 marks)	Q1 compulsory (14 = 5 + 5 + 4) + **any 4 of Q2–Q6** (14 marks each); Q6 is usually theory with an OR choice
ICAI section-wise weightage	I Overview and cost sheet **10%–15%** · II Material, employee, direct expenses, overheads, ABC, cost accounting systems **35%–40%** · III Methods of costing (unit, job, batch, process, joint/by-products, service) **20%–25%** · IV Standard costing, marginal costing, budgets **25%–30%**
Skill-wise weightage	Comprehension & knowledge **20%–30%**; Analysis & application **70%–80%**

Chapter 1: Introduction to Cost and Management Accounting

1.1 Objectives, scope and users

- **Cost accounting** – the application of costing and cost accounting principles, methods and techniques to the ascertainment of costs and the analysis of savings/excesses against standards. **Management accounting** – the application of accounting information to planning, control and decision making.
- **Objectives:** ascertainment of cost; determination of selling price; **cost control and cost reduction**; ascertainment of profit of each activity; assisting management in decision making (make or buy, shut down, pricing); valuation of inventory.
- **Users:** management (pricing, budgeting, performance), employees and unions (bonus, wage negotiations), Government (price fixation, cost audit), investors and lenders, consumers.
- **Relationship:** financial accounting – historical, statutory, whole business; cost accounting – product/department-wise, both historical and estimated, mostly internal; management accounting – uses both for decisions; **financial management** – procurement and use of funds.

1.2 Cost terms and concepts

Term	Meaning
Cost object	Anything for which a cost is measured – product, service, customer, project, department
Cost unit	Unit of product/service in which cost is expressed – per tonne (steel), per km (transport), per patient-day (hospital), per kWh (power), per 1,000 bricks
Cost centre	Location, person or item of equipment for which costs are ascertained – production/service, personal/impersonal, operation/process centres
Responsibility centre	Cost centre (cost), revenue centre (revenue), **profit centre** (revenue and cost), **investment centre** (profit and capital employed – ROI, residual income)
Cost driver	The factor that causes a change in cost (number of set-ups, machine hours, orders)
Opportunity cost	Value of the next best alternative foregone
Sunk cost	Historical cost already incurred – **irrelevant** for decisions
Relevant cost	Future cost that **differs** between alternatives
Differential / incremental cost	Change in total cost between two alternatives
Imputed (notional) cost	Cost not actually incurred, e.g. notional rent of own building, interest on own capital – used in cost accounts, not financial accounts
Out-of-pocket cost	Cost involving cash outflow
Discretionary cost	Fixed costs set by management decision (advertising, R&D)
Engineered cost	Cost with a definite physical relationship to output (material per unit)
Explicit / implicit cost	Paid out vs. notional

1.3 Cost control vs cost reduction

Basis	Cost control	Cost reduction
Aim	Achieve the **target/standard** cost	**Real and permanent reduction** in unit cost below standard
Nature	Preventive, ends when standards are achieved	Corrective; continuous; challenges the standards
Techniques	Budgetary control, standard costing	Value analysis, work study, quality improvement
Assumption	Standards are correct	Standards can be improved

1.4 Elements and classification of cost

- **Elements:** material, employee (labour) and expenses – each **direct** or **indirect**; indirect ones form **overheads** (production, administration, selling, distribution).

- **By behaviour: fixed** (constant in total, falls per unit as output rises), **variable** (constant per unit), **semi-variable** (part fixed, part variable – telephone, power), **step** costs (fixed within a range, jump beyond – supervisor salaries).
- **Separating semi-variable costs:** (i) **high–low (range) method**, (ii) analytical/comparison method, (iii) scattergraph, (iv) least squares.

Variable cost per unit (high–low) = (Cost at high level − cost at low level) ÷ (High output − low output)

Fixed cost = Total cost at any level − (variable cost per unit × output at that level)

WORKED EXAMPLE **High–low method**

At 6,000 units, power cost is ₹70,000; at 10,000 units, ₹90,000. Variable cost = 20,000 ÷ 4,000 = **₹5 per unit**; fixed cost = 70,000 − 6,000 × 5 = **₹40,000**. Estimated cost at 8,000 units = 40,000 + 40,000 = **₹80,000**.

- **Methods of costing:** job, batch, contract, **unit/single output**, process, operating/service, multiple. **Techniques:** historical, **standard costing**, **marginal costing**, **budgetary control**, uniform costing.

1.5 Installation of a costing system and digital costing

- **Points to consider:** nature of business and product; organisational structure; existing records; size and layout; cost of the system (should not exceed its benefits); co-operation of staff; level of detail needed; methods of maintaining accounts (integral/non-integral).
- **Practical difficulties:** lack of management support; resistance from staff; non-co-operation at other levels; shortage of trained staff; heavy cost of installation. Overcome by **training, involvement** and showing benefits.
- **Digital costing** (new syllabus): use of **ERP systems** (integrated modules for procurement, inventory, production and costing), **Government e-Marketplace (GeM)** for public procurement, data analytics, AI-assisted machine use, cloud-based cost databases and job-cost cards.
- **Cost Accounting Standards (CAS)** – issued by the ICMAI's Cost Accounting Standards Board; Companies (Cost Records and Audit) Rules, 2014 require specified companies to maintain cost records (s. 148, Companies Act).

Chapter 2: Material Cost

2.1 Procurement and valuation of receipts

- **Purchase procedure:** purchase requisition (by storekeeper/user department) → selection of supplier (quotations, tenders, **GeM** for Government buyers) → **purchase order** → receipt and inspection (**goods received note**, inspection report) → checking and passing of invoice → payment.
- **Bill of materials (BOM):** a schedule of the standard quantities of materials for a job/product – used by **purchase** (planning purchases), **production** (issuing material), **stores** (preparing for issue) and **costing** (comparing actual vs standard; job cost estimate). **Material requisition note** – authority to the storekeeper to issue.
- **Valuation of receipts (CAS-6):** purchase price + duties and taxes (**excluding those for which credit is available**, e.g. GST ITC) + freight inward, insurance, other expenditure directly attributable – **trade discounts, rebates**, duty drawback, **refundable taxes**. **Cash discount** is **not deducted** (finance item). Demurrage/detention charges, penalties – **not** material cost (charged to costing P&L). Normal loss is absorbed (raises unit cost); abnormal loss is written off.

2.2 Stock levels

Re-order level (ROL) = Maximum consumption × Maximum lead time [or Safety stock + lead-time consumption]

Minimum level = ROL – (Normal/average consumption × Normal/average lead time)

Maximum level = ROL + ROQ – (Minimum consumption × Minimum lead time)

Average stock level = ½ (Minimum level + Maximum level) [or Minimum level + ½ ROQ]

Danger level = Normal (or minimum) consumption × Lead time for emergency purchases

Safety stock = Annual demand ÷ 365 × (Maximum lead time – Normal lead time) [or (max usage × max LT) – (avg usage × avg LT)]

WORKED EXAMPLE Stock levels (verified in Python)

Consumption per week – maximum 600, normal 450, minimum 300 units; lead time – maximum 6, normal 4, minimum 2 weeks; ROQ 2,000 units.

ROL = 600 × 6 = **3,600**; minimum = 3,600 – 450 × 4 = **1,800**; maximum = 3,600 + 2,000 – 300 × 2 = **5,000**; average = ½ (1,800 + 5,000) = **3,400** (alternatively 1,800 + ½ × 2,000 = 2,800).

2.3 Economic order quantity (EOQ)

EOQ = √(2 × A × O ÷ C) A = annual demand (units), O = ordering cost per order, C = carrying cost per unit per year

At EOQ, **annual ordering cost = annual carrying cost**. Total inventory cost = purchase cost + (A ÷ Q) × O + (Q ÷ 2) × C. With **quantity discounts**, compare the total cost at EOQ with the total cost at each discount break-point and choose the lowest.

WORKED EXAMPLE EOQ and a discount offer (verified in Python)

A = 20,000 units; O = ₹250; C = ₹10 per unit per year; price ₹100.

EOQ = √(2 × 20,000 × 250 ÷ 10) = **1,000 units**; orders = 20; ordering cost 5,000 = carrying cost 5,000; total = 20,00,000 + 10,000 = **₹20,10,000**. If the supplier offers 1% discount for orders of 4,000 units: purchase 19,80,000 + ordering 5 × 250 = 1,250 + carrying 2,000 × 10 = 20,000 → **₹20,01,250** – accept the discount (saves ₹8,750).

2.4 Inventory control techniques

- **ABC analysis** (always-better control): A items – about **10% of items, 70% of value** – tight control, frequent review; B – 20% items, 20% value; C – 70% items, 10% value – simple control. **VED** (vital, essential, desirable – spares); **FSN** (fast, slow, non-moving); **HML** (high, medium, low unit price); **SDE** (scarce, difficult, easy availability); **perpetual inventory system** with **continuous stock-taking**; **JIT** – a **demand-pull** system: produce/buy only when demanded; principles – (i) produce only what is required, (ii) eliminate waste; zero inventory, small lots, reliable suppliers.

Inventory turnover ratio = Cost of materials consumed ÷ Average stock of materials (days = 365 ÷ ratio)

2.5 Pricing of issues

Method	Issue price	Effect when prices rise
FIFO	Earliest lots first	Issues at old (low) cost; closing stock at current prices; higher profit
LIFO	Latest lots first	Issues at current cost; closing stock undervalued (not permitted by AS 2/Ind AS 2)
Simple average	Average of prices in stock (ignoring quantities)	Rough
Weighted average	Total cost ÷ total units in stock, recomputed after each receipt	Smooths fluctuations; allowed by AS 2
Standard / inflated / replacement price	Pre-set or current	For control or special cases

Returns: materials returned to the **supplier** are shown at their purchase price (as an issue); **returns from production** (excess issues) are taken back at the **price of the original issue** – under FIFO treated as a fresh receipt at that price or adjusted to the next issue as per ICAI illustration. **Shortage** found on stock-taking: normal – absorbed in the issue price (inflated price); abnormal – written off to costing P&L.

2.6 Material losses

Loss	Nature	Treatment
Waste	Unavoidable, no value	Normal – absorbed in good units; abnormal – costing P&L
Scrap	Small realisable value	Normal: credit realised value to the job/process or to overheads; abnormal: costing P&L
Spoilage	Damaged units that cannot be rectified	Normal: cost borne by good units; abnormal: costing P&L
Defectives	Can be rectified at extra cost	Normal: rectification cost charged to job/overhead; abnormal: costing P&L

Chapter 3: Employee Cost and Direct Expenses

3.1 Employee cost (CAS-7)

- **Includes:** wages/salary, overtime (at normal rate), bonus, incentives, employer's PF/ESI contributions, gratuity, leave pay, welfare costs, perquisites. **Excludes:** penalties, abnormal idle time, cost of strikes (charged to costing P&L).
- **Departments involved:** personnel/HR (recruitment, records), engineering and work study (job evaluation, standards), **time-keeping** (attendance – gate cards, biometric), **time-booking** (job cards – time spent on each job), payroll, cost accounting.

Effective hourly cost = Total annual employee cost ÷ Effective productive hours (excluding leave, holidays and normal idle time)

3.2 Idle time and overtime

Item	Normal (unavoidable)	Abnormal (avoidable)
Idle time – power failure, waiting for work, breakdown	Included in the labour rate / treated as production overhead	Charged to **costing P&L**
Overtime premium	(i) general pressure of work – production overhead; (ii) at customer's request – charged to that **job**	Due to bad planning/abnormal causes – **costing P&L**

3.3 Remuneration and incentive schemes

Halsey premium = Time allowed (TA), time taken (TT), rate R: Earnings = TT × R + 50% × (TA − TT) × R

Rowan premium = Earnings = TT × R + [(TA − TT) ÷ TA] × TT × R

Emerson efficiency = Below 66⅔% – time wage; 66⅔%–100% – bonus rising to 20%; above 100% – 20% + 1% for each 1% above 100%

Taylor differential piece rate = 83% of piece rate below standard; 125% of piece rate at/above standard

Merrick's multiple piece rate = Up to 83% efficiency – normal rate; 83%–100% – 110%; above 100% – 120% of the normal rate

Gantt task bonus = Below standard – time rate (guaranteed); at standard – time rate + bonus (usually 20%); above standard – high piece rate

WORKED EXAMPLE Halsey vs Rowan (verified in Python)

Time allowed 10 hours; time taken 8 hours; rate ₹50 per hour. **Halsey:** 8 × 50 + 50% × 2 × 50 = **₹450** (₹56.25 per hour). **Rowan:** 8 × 50 + (2 ÷ 10) × 8 × 50 = **₹480** (₹60 per hour). Rowan pays more when time saved is **below 50%** of time allowed; both pay the same at 50% saving; Halsey pays more above that.

- **Features of a good incentive scheme:** simple and easy to understand; fair to workers and management; **gains shared** (not all to workers – Halsey/Rowan); quality maintained (tie bonus to output **meeting quality standards**); guaranteed minimum wage; prompt payment; acceptable to unions. **Group schemes:** Priestman's, Scanlon, Rucker, Towne gain-sharing; **budgeted expenses bonus**, **cost efficiency bonus**.

3.4 Labour turnover

Separation method = Number of separations ÷ Average number of workers × 100

Replacement method = Number replaced ÷ Average number of workers × 100

Flux method = (Separations + Replacements) ÷ Average workers × 100 [with new accessions: (Separations + Accessions) ÷ Average workers × 100]

WORKED EXAMPLE **Labour turnover (verified in Python)**

Workers at the start 380, at the end 420 (average 400). Separations 30; replacements 24; new recruits for expansion 12. Separation **7.5%**; replacement **6%**; flux (separations + replacements) **13.5%**; flux including all accessions (30 + 36) **16.5%**.

- **Causes:** personal (marriage, health), unavoidable (retirement, death), **avoidable** (low pay, poor conditions, lack of promotion, bad relations). **Costs: preventive** (welfare, personnel department) and **replacement** (recruitment, training, lower output of new workers, scrap, tool breakage).

3.5 Direct expenses (CAS-10)

Expenses other than material and employee cost that can be **identified** with a cost object – royalty based on production, hire charges for special equipment, cost of special designs/patterns for a job, sub-contract (job work) charges, **software development cost for a specific product**. Measured at invoice price/actual cost net of recoverable taxes.

Chapter 4: Overheads – Absorption Costing Method

4.1 Classification and steps

- **Functions:** production (factory), administration, selling, distribution, research and development. **Behaviour:** fixed, variable, semi-variable. **Steps:** collection → **allocation** (wholly to one cost centre) → **apportionment** (shared on a fair basis) → **re-apportionment** of service departments (secondary distribution) → **absorption** into products.

Overhead	Basis of apportionment
Rent, rates, building insurance, lighting (if no meters), heating	**Floor area**
Power	Horse power × machine hours (or kWh)
Depreciation and insurance of plant	**Capital value** of plant
Canteen, welfare, supervision, personnel	**Number of employees**
Stores overhead	Value or number of material requisitions
Lighting	Number of light points
Repairs	Machine hours or capital value

4.2 Secondary distribution

Method	When used
Direct re-distribution	Service departments' costs go only to production departments (ignores inter-service work)
Step (non-reciprocal) method	Service department serving the largest number of departments closed first; no return of cost
Repeated distribution	Reciprocal services – distribute repeatedly until amounts become negligible
Trial and error / simultaneous equations	Reciprocal services – solve X = S1 + share of Y; Y = S2 + share of X

WORKED EXAMPLE Simultaneous equations (verified in Python)

Primary totals: P1 ₹2,00,000, P2 ₹1,60,000, P3 ₹1,40,000, S1 ₹55,000, S2 ₹38,000. S1 serves P1 40%, P2 30%, P3 10%, S2 20%; S2 serves P1 30%, P2 40%, P3 20%, S1 10%.

X = 55,000 + 0.10Y; Y = 38,000 + 0.20X → X = **₹60,000**, Y = **₹50,000**.

P1 = 2,00,000 + 24,000 + 15,000 = **₹2,39,000**; P2 = 1,60,000 + 18,000 + 20,000 = **₹1,98,000**; P3 = 1,40,000 + 6,000 + 10,000 = **₹1,56,000** (total ₹5,93,000 = all primary overheads).

4.3 Absorption

- **Methods:** percentage of direct material cost, prime cost or direct wages; **direct labour hour rate**; **machine hour rate**; rate per unit of production.
- **Blanket rate** (single rate for the whole factory) vs **departmental rates** – departmental rates are preferred where products spend **different times** in departments.

Machine hour rate = Overheads of the machine (standing + running charges) ÷ Productive machine hours

WORKED EXAMPLE Machine hour rate (verified in Python)

Machine cost ₹9,60,000, scrap value ₹60,000, life 10 years; working hours 2,000 a year including 200 hours for maintenance; repairs ₹36,000 p.a.; rent and insurance share ₹54,000 p.a.; supervision share ₹72,000 p.a.; power 12 units per running hour at ₹10.

Standing charges = depreciation 90,000 + repairs 36,000 + rent/insurance 54,000 + supervision 72,000 = 2,52,000 ÷ 1,800 productive hours = ₹140; power ₹120 per hour → **MHR = ₹260**.

4.4 Under- and over-absorption

Pre-determined rate = Budgeted overheads ÷ Budgeted base (hours/units)

- Causes: error in estimating overheads or base; seasonal variation; idle capacity; change in methods.
- **Treatment:** (i) small amounts – **costing P&L**; (ii) large amounts due to wrong estimates – **supplementary rate** to cost of sales, finished goods and WIP (in the ratio of overheads absorbed or units); (iii) due to abnormal factors (idle capacity, strikes) – **costing P&L**; (iv) carried forward in seasonal businesses.
- **Entries:** overheads absorbed – Dr WIP, Cr Overhead control; under-absorption – Dr Costing P&L, Cr Overhead control; over-absorption – Dr Overhead control, Cr Costing P&L.

4.5 Administration, selling and distribution overheads

Administration – usually absorbed as % of works cost, or treated as period cost; **selling** – % of sales or per unit; **distribution** – per unit. **R&D:** basic research – period cost; applied/development for a product – charged to that product (amortised). **Packing:** primary packing – direct material; **secondary packing** for transport – distribution overhead; fancy packing – selling overhead.

Chapter 5: Activity Based Costing (ABC)

5.1 Concept

- Overheads are traced to **activities** (cost pools), and from activities to products using **cost drivers**. Traditional costing uses volume-based rates and **over-costs high-volume** simple products while **under-costing low-volume complex** products.
- **Activity hierarchy: unit-level** (machine power – per unit), **batch-level** (set-ups, material handling – per batch), **product-level** (product design – per product line), **facility-level** (plant management – not traceable; allocated).
- **Steps:** identify activities → create cost pools → determine cost drivers → compute **cost driver rate** = pool cost ÷ driver volume → charge products by driver usage.

WORKED EXAMPLE **ABC (verified in Python)**

Overheads ₹3,00,000: set-ups ₹1,20,000 (60 set-ups → ₹2,000 each); material handling ₹90,000 (300 moves → ₹300 each); inspection ₹90,000 (180 inspections → ₹500 each). Product X: 40 set-ups, 100 moves, 60 inspections = 80,000 + 30,000 + 30,000 = **₹1,40,000**. Product Y: 20, 200, 120 = 40,000 + 60,000 + 60,000 = **₹1,60,000**.

- **Usefulness/suitability:** high overheads; wide product variety and volume differences; overheads not related to volume; complex production; intense competition needing accurate pricing; when traditional costs are not trusted by managers. **Benefits:** accurate product cost, better pricing and product-mix decisions, cost reduction by removing **non-value-added activities**. **Activity Based Management (ABM)** – cost reduction, business process re-engineering, benchmarking, performance measurement; **Activity Based Budgeting (ABB)**. **Customer profitability analysis** – charge customer-level activities (visits, orders, transport, returns) to customer categories.

Chapter 6: Cost Sheet

6.1 Format (manufacturing)

```
Direct materials consumed (opening + purchases + carriage inward - closing - returns - sale of scrap)
xxx
Direct employee (labour) cost                                                              xxx
Direct expenses                                                                            xxx
PRIME COST                                                                                 xxx
Add: Works/factory overheads                                                                xxx
GROSS WORKS COST                                                                           xxx
Add: Opening WIP  Less: Closing WIP                                                        xxx
WORKS / FACTORY COST                                                                       xxx
Add: Quality control cost, R&D (production), administration overheads relating to production    xxx
Less: Credit for recoveries / scrap / by-products / saleable waste                        (xx)
Add: Primary packing cost                                                                   xxx
COST OF PRODUCTION                                                                         xxx
Add: Opening stock of finished goods  Less: Closing stock of finished goods                xxx
COST OF GOODS SOLD                                                                          xxx
Add: Administration overheads (general), selling and distribution overheads                xxx
COST OF SALES                                                                               xxx
Profit / (Loss)                                                                             xxx
SALES                                                                                       xxx
```

6.2 Treatment of special items

Item	Treatment in cost sheet
Interest on borrowings, dividends, income tax, donations, fines, penalties, loss on sale of assets, goodwill written off, preliminary expenses	**Excluded** – pure financial items
Abnormal losses (fire, strikes, abnormal idle time, abnormal scrap)	**Excluded** – costing P&L
Cash discount allowed	Excluded (finance) – or selling overhead as per ICAI illustration if stated
Notional rent/interest on own capital	Included (imputed cost) if cost accounts are to reflect them
Bad debts (normal)	Selling overhead
Primary packing	Cost of production; secondary – distribution
Subsidy from Government for production	Reduce the related cost (if specific) VERIFY
Wages for idle time during a **lockdown** (abnormal)	Costing P&L
Royalty on production	Direct expense; royalty on sales – selling overhead

- **Service-sector cost sheet:** direct material (if any), direct employee cost, direct expenses, overheads (service-related), administration, selling → **total cost per unit of service** (per patient-day, per passenger-km, per room-day).

Chapter 7: Cost Accounting System

7.1 Non-integrated (cost control accounts)

Separate cost ledgers: **Cost Ledger Control A/c** (General Ledger Adjustment A/c) records items from the financial books; Stores Ledger Control, WIP Control, Finished Goods Control, Overhead Control A/cs, Cost of Sales A/c, Costing P&L A/c.

Transaction	Entry (non-integrated)
Purchase of materials	Stores Ledger Control Dr / Cost Ledger Control Cr
Issue of direct materials	WIP Control Dr / Stores Ledger Control Cr
Wages paid	Wages Control Dr / Cost Ledger Control Cr
Direct wages charged	WIP Control Dr / Wages Control Cr
Overheads incurred	Overhead Control Dr / Cost Ledger Control Cr
Overheads absorbed	WIP Control Dr / Overhead Control Cr
Finished goods	Finished Goods Control Dr / WIP Control Cr
Cost of sales	Cost of Sales Dr / Finished Goods Control Cr
Sales	Cost Ledger Control Dr / Costing P&L Cr

7.2 Integrated accounts

A single set of books for both purposes – no Cost Ledger Control A/c; real and personal accounts (bank, debtors, creditors) are kept. **Advantages:** no reconciliation, saving in effort, prompt data. **Pre-requisites:** clear policy on the extent of integration, suitable coding, centralised control, agreement on treatment of notional items.

7.3 Reconciliation of cost and financial profits

Reasons: items only in financial accounts (interest/dividend received, rent received, profit/loss on sale of assets, fines, donations, income tax, preliminary expenses, goodwill written off); items only in cost accounts (**notional rent, interest on own capital**); **under/over-absorption** of overheads; **different stock valuations** (opening and closing stock of materials, WIP, finished goods); different depreciation methods.

WORKED EXAMPLE **Reconciliation (verified in Python)**

Profit as per cost accounts ₹5,00,000. Items: dividend received ₹20,000 (only in financial accounts); preliminary expenses written off ₹15,000; overheads under-absorbed in cost accounts ₹30,000; closing stock valued ₹12,000 higher in financial accounts; interest on loan ₹8,000 (only in financial accounts); notional rent charged in cost accounts ₹25,000.

Profit as per financial accounts = 5,00,000 + 20,000 − 15,000 − 30,000 + 12,000 − 8,000 + 25,000 = **₹5,04,000**.

Rule: start with cost profit → **add** incomes only in financial books, over-absorption, notional costs, higher closing stock (or lower opening stock) in financial books → **deduct** expenses only in financial books, under-absorption, lower closing stock (or higher opening stock) in financial books. A **memorandum reconciliation account** may be prepared instead.

Chapter 8: Unit and Batch Costing

- **Unit (single/output) costing:** one product or a few grades; cost per unit = total cost ÷ units (cost sheet). Industries: bricks, cement, steel, mining, dairy, paper.
- **Batch costing:** a batch of identical units is the cost unit (pharma, toys, garments, components). **Economic batch quantity (EBQ):**

EBQ = √(2 × D × S ÷ C) D = annual demand, S = set-up cost per batch, C = carrying cost per unit per year

WORKED EXAMPLE **EBQ (verified in Python)**

D = 60,000 units; set-up cost ₹600 per batch; carrying cost ₹2 per unit per year → EBQ = √(2 × 60,000 × 600 ÷ 2) = **6,000 units**; 10 batches a year.

Chapter 9: Job Costing

- Each **job** is a cost unit (printing, furniture, repairs, interior decoration). **Job cost card/sheet** – records material (requisitions), labour (job cards), overheads (absorbed), and computes profit/price. **Databases** of past jobs help estimation and quotations.
- **Work-in-progress** – the cost of incomplete jobs at the period end. **Profit on incomplete jobs** – not credited.
- **Advantages:** profitability of each job; basis for estimating future jobs and quotations; control of spoilage and defectives by job; helps in price fixation; identifies efficient and inefficient jobs. **Limitations:** clerical work; costs are historical; difficulties with jobs of short duration.
- **Defective work:** normal defectives – charged to general overhead (if common to all jobs) or the specific job; abnormal – costing P&L.

Chapter 10: Process and Operation Costing

10.1 Process losses

- **Normal loss** – expected; its cost is borne by good units; scrap value credited to the process.
- **Abnormal loss** – excess of actual loss over normal; valued like good units; transferred to **Abnormal Loss A/c** (credited with its scrap value; balance to costing P&L).
- **Abnormal gain** – actual loss less than normal; valued like good units; debited to the process; Abnormal Gain A/c is debited with the scrap value foregone; balance credited to costing P&L.

Cost per unit of normal output = (Total process cost − scrap value of normal loss) ÷ (Input units − normal loss units)

WORKED EXAMPLE **Normal and abnormal loss (verified in Python)**

Input 10,000 units at ₹20 = 2,00,000; labour ₹60,000; overheads ₹46,500; normal loss 5% (scrap ₹5 per unit); output 9,200 units.

Normal loss 500 units (scrap 2,500); abnormal loss = 10,000 − 500 − 9,200 = 300 units. Cost per unit = (3,06,500 − 2,500) ÷ 9,500 = **₹32**. Output 9,200 × 32 = **₹2,94,400**; abnormal loss 300 × 32 = **₹9,600** (net loss to costing P&L after scrap 1,500 = **₹8,100**).

10.2 Equivalent production

- **FIFO:** opening WIP completed first – EU = opening WIP × (1 − degree of completion) + units started and completed + closing WIP × degree. **Weighted average:** EU = units completed + closing WIP × degree (opening WIP cost added to current cost).

WORKED EXAMPLE **FIFO equivalent units (verified in Python)**

Opening WIP 2,000 units (materials 100%, conversion 60%); introduced 18,000; closing WIP 3,000 (materials 100%, conversion 40%); completed 17,000. Current costs: materials ₹3,60,000; conversion ₹3,40,000.

EU materials = 15,000 + 3,000 = **18,000** → ₹20; EU conversion = 2,000 × 40% + 15,000 + 3,000 × 40% = 800 + 15,000 + 1,200 = **17,000** → ₹20.

- **Inter-process profit:** transfers at cost plus a margin; the unrealised profit in closing stock is eliminated (provision for unrealised profit) to find actual profit.
- **Operation costing** – cost per operation (component manufacture); **process vs job costing** – continuous homogeneous output vs specific orders.

Chapter 11: Joint Products and By-products

- **Joint products:** two or more products of **significant value** produced simultaneously from the same input (petrol, diesel, kerosene). **By-product:** small value, incidental (molasses in sugar). **Split-off point** – where products become separately identifiable.
- **Apportionment of joint costs:** (i) **physical units**, (ii) **average unit cost**, (iii) survey/points, (iv) **sales value at split-off**, (v) **net realisable value** (final sales value – further processing – selling costs), (vi) contribution margin.

WORKED EXAMPLE **Sales value at split-off (verified in Python)**

Joint cost ₹3,00,000. A: 4,000 units at ₹50 = 2,00,000; B: 6,000 at ₹30 = 1,80,000; C: 2,000 at ₹60 = 1,20,000 (total 5,00,000). Joint cost: A **₹1,20,000**, B **₹1,08,000**, C **₹72,000**.

- **By-product accounting:** (i) realisation credited to costing P&L as other income (small value); (ii) credited to the **cost of the main product** (NRV deducted from joint cost); (iii) **reverse cost method** – sales – profit – selling – further processing cost = cost at split-off; (iv) replacement/opportunity cost (when used internally).
- **Further processing decision:** process further only if **incremental revenue > incremental cost** (joint costs are irrelevant).

Chapter 12: Service Costing

Industry	Cost unit
Goods transport	Tonne-km (absolute or commercial)
Passenger transport	Passenger-km
Hotel	Room-day / bed-night
Hospital	Patient-day / bed-day
Power	kWh
Toll road	Per vehicle / per vehicle category
BPO / IT services	Per call / per project-hour
Education / training	Per student per course

- **Cost classification:** standing (fixed) charges – insurance, licence, driver's salary, depreciation (time-based); running charges – fuel, oil, tyres, depreciation (use-based); maintenance – repairs.

Passenger-km = Number of vehicles × seats × occupancy % × distance per trip × trips per day × days

WORKED EXAMPLE **Fare per passenger-km (verified in Python)**

One 50-seat bus, route 100 km, 2 single trips a day, 25 days a month, 80% occupancy → 50 × 80% × 100 × 2 × 25 = **2,00,000 passenger-km**. Monthly cost ₹4,00,000 → **₹2 per passenger-km**; with 20% profit on cost the fare is **₹2.40 per passenger-km** (₹240 per passenger for the full route).

- **Toll roads** – total cost (construction recovered over the concession period + maintenance) ÷ expected vehicles (weighted by category) → toll per vehicle. **Hotels** – room-days occupied × rate, with different rates for single/double rooms and seasons.

Chapter 13: Standard Costing

13.1 Concepts

- **Standard cost** – a pre-determined cost under efficient conditions. Types of standards: **ideal**, **normal**, **basic** (unchanged base), **current/attainable** (most useful). **Variance analysis** – difference between standard cost of actual output and actual cost, analysed by cause; **management by exception**.
- **Advantages:** cost control, performance measurement, inventory valuation, simplifies records, motivation. **Limitations:** difficult to set standards; rapid technological change; volatile prices.

13.2 Variance formulas

Material cost variance = SQ × SP − AQ × AP = price variance + usage variance

Material price variance = (SP − AP) × AQ

Material usage variance = (SQ − AQ) × SP = mix variance + yield variance

Material mix variance = (Revised SQ − AQ) × SP [RSQ = total AQ in standard ratio]

Material yield variance = (SQ − RSQ) × SP

Labour cost variance = SH × SR − AH paid × AR = rate + efficiency + idle time

Labour rate variance = (SR − AR) × AH paid

Labour efficiency variance = (SH − AH worked) × SR

Idle time variance = (AH paid − AH worked) × SR (always adverse)

Variable overhead cost variance = Standard VO for actual output − Actual VO = expenditure + efficiency

VO expenditure variance = AH worked × SR (VO) − Actual VO; VO efficiency := (SH − AH) × SR (VO)

Fixed overhead cost variance = Absorbed FO (actual output × standard rate per unit) − Actual FO

FO expenditure (budget) variance = Budgeted FO − Actual FO

FO volume variance = Absorbed FO − Budgeted FO = efficiency + capacity (+ calendar)

FO efficiency variance = (SH for actual output − AH) × standard FO rate per hour

FO capacity variance = (AH − budgeted hours) × standard FO rate per hour

Sales value variance = Actual sales − Budgeted sales = price + volume (volume = mix + quantity)

Sales price variance = (AP − BP) × actual quantity; Sales volume := (AQ − BQ) × BP

WORKED EXAMPLE Material and labour variances (verified in Python)

Output 10,000 units. Standard: 2 kg at ₹50; 3 hours at ₹40. Actual: 21,000 kg at ₹48; 31,000 hours paid at ₹42, of which 29,000 worked.

MPV = (50 − 48) × 21,000 = **₹42,000 (F)**; MUV = (20,000 − 21,000) × 50 = **₹50,000 (A)**; MCV = 10,00,000 − 10,08,000 = **₹8,000 (A)**.

LRV = (40 − 42) × 31,000 = **₹62,000 (A)**; LEV = (30,000 − 29,000) × 40 = **₹40,000 (F)**; idle time = 2,000 × 40 = **₹80,000 (A)**; LCV = 12,00,000 − 13,02,000 = **₹1,02,000 (A)**.

WORKED EXAMPLE **Fixed overhead variances (verified in Python)**

Budget: 12,000 units, 2 hours per unit (24,000 hours), FO ₹4,80,000 (₹20 per hour, ₹40 per unit). Actual: 11,000 units, 23,000 hours, FO ₹4,90,000.

Absorbed = 11,000 × 40 = 4,40,000. FOCV = **₹50,000 (A)** = expenditure **₹10,000 (A)** + volume **₹40,000 (A)**; volume = efficiency (22,000 − 23,000) × 20 = **₹20,000 (A)** + capacity (23,000 − 24,000) × 20 = **₹20,000 (A)**.

- **Reconciliation** of budgeted/standard profit with actual profit by adding favourable and deducting adverse variances. **Responsibility:** price – purchase manager; usage – production; rate – personnel/HR; efficiency – production supervisor; idle time – production planning/maintenance; sales variances – sales manager.

Chapter 14: Marginal Costing

14.1 Concepts and formulas

- Only **variable costs** are charged to products; fixed costs are **period costs**. Stock valued at variable cost. **Absorption vs marginal profit:** differ by the fixed overhead in the change in stock – if closing stock > opening stock, **absorption profit is higher**.

Contribution = Sales – Variable cost = Fixed cost + Profit

P/V ratio = Contribution ÷ Sales × 100 = Change in profit ÷ Change in sales × 100

Break-even point (units) = Fixed cost ÷ Contribution per unit; BEP (₹) := Fixed cost ÷ P/V ratio

Margin of safety = Actual sales – BE sales = Profit ÷ P/V ratio

Sales for target profit = (Fixed cost + Target profit) ÷ P/V ratio

Angle of incidence = Angle between the sales line and total cost line at BEP – a wide angle shows high profit after BEP

Cash break-even = (Fixed cost – non-cash fixed costs) ÷ Contribution per unit

Composite BEP (multi-product) = Fixed cost ÷ Composite P/V ratio (weighted by sales mix)

WORKED EXAMPLE **CVP (verified in Python)**

Selling price ₹100; variable cost ₹60; fixed cost ₹4,00,000; sales 15,000 units. P/V = **40%**; BEP = 10,000 units (**₹10,00,000**); MOS = ₹5,00,000 (**33.33%**); profit = **₹2,00,000** (= MOS × P/V). Sales for profit of ₹2,00,000 = 6,00,000 ÷ 40% = **₹15,00,000**.

14.2 Decision making

Decision	Rule
Key (limiting) factor	Rank products by **contribution per unit of the key factor** (per machine hour, per kg)
Make or buy	Buy if purchase price < **variable cost** + avoidable fixed cost + opportunity cost of capacity
Accept a special order	Accept if price > variable cost (and no effect on regular price/capacity)
Shut down / discontinue	Discontinue if contribution < **avoidable fixed costs**
Shut-down point	Avoidable fixed cost ÷ contribution per unit
Export at lower price	Accept if contribution positive and spare capacity
Sales mix	Choose the mix with the **highest total contribution**

Chapter 15: Budgets and Budgetary Control

15.1 Concepts

- **Budget** – a quantitative plan for a future period; **budgetary control** – setting budgets, comparing actual with budget and taking corrective action. **Components of a budgetary control system:** (i) budget centres and **budget manual**; (ii) **budget committee** and budget officer; (iii) **budget period** and **key/principal budget factor** (limiting factor such as sales demand, material, capacity); (iv) comparison of actual with budget, **variance analysis** and corrective action (follow-up).
- **Types:** functional (sales, production, materials, labour, overheads, cash, capital expenditure) and **master budget**; **fixed vs flexible** (prepared for different activity levels – separates fixed, variable, semi-variable costs); **zero-based budgeting** (every item justified afresh – decision packages); **performance budgeting** (programmes, activities, results – Government); **rolling (continuous) budgets**; **activity-based budgeting**.

Production budget (units) = Budgeted sales + Closing stock of finished goods − Opening stock of finished goods

Material purchase budget = Material required for production + Closing stock of material − Opening stock of material

- **Flexible budget** – total cost at level x = fixed cost + variable cost per unit × x (+ semi-variable cost: fixed part + variable part). Semi-variable costs split by the high–low method.

Formula and number sheet

Topic	Formula / number
EOQ / EBQ	√(2AO ÷ C) / √(2DS ÷ C); at EOQ ordering cost = carrying cost
Stock levels	ROL = max usage × max LT; Min = ROL − avg usage × avg LT; Max = ROL + ROQ − min usage × min LT
Halsey / Rowan	TT × R + 50% × saving × R / TT × R + (saving ÷ TA) × TT × R
Labour turnover	Separation ÷ avg; replacement ÷ avg; flux (sep + rep) ÷ avg
MHR	(standing charges ÷ productive hours) + running cost per hour
Process	Cost per unit = (cost − scrap of normal loss) ÷ (input − normal loss)
Variances	MCV = MPV + MUV; LCV = LRV + LEV + idle; FOCV = expenditure + volume (efficiency + capacity)
CVP	P/V = C ÷ S; BEP = F ÷ (P/V); MOS = profit ÷ (P/V); target sales = (F + target) ÷ (P/V)
Budgets	Production = sales + closing FG − opening FG; purchases = usage + closing RM − opening RM
Inventory turnover	Materials consumed ÷ average stock

Common mistakes in answers

1. Including **cash discount, interest, income tax, penalties or abnormal losses** in the cost sheet.
2. Valuing **abnormal loss/gain** at scrap value instead of the normal cost per unit.
3. Using **AH worked** in the labour rate variance – the rate variance uses **hours paid**; idle time is valued at the standard rate.
4. Forgetting **(F)/(A)** labels, or reconciling variances that do not add up to the total.
5. In secondary distribution, ignoring **reciprocal services** when the question says departments serve each other.
6. In key-factor questions, ranking by **contribution per unit** instead of **per unit of the limiting factor**.
7. In joint-product decisions, allocating **joint costs** when deciding about further processing (they are irrelevant).
8. In EOQ with discounts, comparing only purchase price, not **total cost** (purchase + ordering + carrying).
9. In process costing (FIFO), adding opening WIP cost to current costs before computing the rate.
10. Not stating **assumptions** (e.g. 52 weeks, 8-hour day, 365 days) in machine-hour and service-costing questions.