Module 5 · Variance analysis P16 · 5.1, 5.2

SM pp. 331–410 (exercise 411–416). **Q5 = one 14-mark variance question in every paper**, plus MCQ (v) (a back-solve) and a theory MCQ. Module 5 per paper: **J26-20 · D25-18 · J25-16 · D24-16 · J24-16 · D23-16** (J23-14, old layout); Dec'26 expected ≈ 18.

Paper	Q5 (14)	MCQs
Dec'23	material, labour, VOH, FOH variances + **reconcile actual with standard profit**	FOH volume, two products
Jun'24	(a) two worker grades, breaks, idle time; (b) **overheads from a flexible budget**	actual price from the price variance
Dec'24	full set incl. power-failure idle time + sales; **reconcile**	standard material cost
Jun'25	standard cost of output, all cost variances, **reconcile standard and actual cost**	standard material cost (= D24 word for word)
Dec'25	(a) **missing material variances with a mix variance**; (b) **back-solve overhead variances**	FOH volume · standard v budget (theory)
Jun'26	(a) **two grades with process loss: price, usage, mix, yield**; (b) **budget v actual profit: cost, sales price, sales volume**	actual hours from efficiency · capacity usage ratio

HOW IT IS ASKED · DEC'26

- **Two kinds of Q5**: one 14-mark "full set + reconciliation" (D23, D24, J25) or two 7-mark halves (J24, D25, J26). The last two papers were halves: mix / yield and missing figures (a), overheads or sales (b).
- Most likely Dec'26: **mix and yield** (D25, J26), **overheads with capacity / efficiency (and calendar)** (MQP, PTP), a **labour gang** (MQP), or the full set + reconciliation.
- Every answer = the four-column table (standard, revised standard, actual at standard, actual) + each variance with F / A + a check line.

A Formula sheet — when to use

Formula (F if positive)	Notes	SM
Material cost = SQ × SP − AQ × AP = usage + price	SQ = standard quantity for the ACTUAL output.	[SM 334]
Usage = SP (SQ − AQ) = **mix** SP (RSQ − AQ) + **yield** SP (SQ − RSQ)	RSQ = actual total input in the standard proportions. Yield also = standard cost per unit of output × (actual − standard output).	[SM 334]
Price = AQ (SP − AP)	On purchases if "extracted at receipt" (Illus. 21), else on usage.	[SM 335]
Labour cost = ST × SR − AT × AR = rate + efficiency (+ idle)	Rate on hours PAID; efficiency on hours WORKED.	[SM 335]
Rate = AT (SR − AR); **efficiency** = SR (ST − AT) = mix + yield	Gang mix: SR (revised standard hours − actual hours).	[SM 335–336]
Idle time = idle hours × SR (always A)	Power failure, waiting for material — abnormal idle only.	[SM 337]
VOH: expenditure = SR × AH − actual; efficiency = SR (SH − AH)	Rate per hour = VOH per unit ÷ hours per unit.	[SM 355–356]
FOH: expenditure = budget − actual; volume = SR (SH − BH) = efficiency SR (SH − AH) + capacity SR (AH − BH) (+ calendar)	SR = budgeted FOH ÷ budgeted hours. Calendar = SR × (revised budget hours − budget hours) for extra / fewer days.	[SM 356–357]
Sales price = AQ (AP − SP); **sales volume** = (AQ − BQ) × standard profit (or price)	Profit basis for a profit reconciliation; price basis for a sales-value variance.	[SM 332, 339]
Ratios: efficiency = SH ÷ AH; activity = SH ÷ BH; capacity = AH ÷ BH (× 100)	Activity = efficiency × capacity (MCQ (xi)).	[SM 358–359]

B Material: mix, yield, missing figures · Q5(a) 5.1

1 · Standard for the actual output
scale the standard batch (allow the normal loss: input = output ÷ yield %)

↓

2 · Four columns per input
SQ×SP · RSQ×SP · AQ×SP · AQ×AP

↓

3 · Differences
yield = 1 − 2 · mix = 2 − 3 · usage = 1 − 3 · price = 3 − 4 · cost = 1 − 4

↓

4 · Check
mix + yield = usage; usage + price = cost

Missing-figure questions: write the unknowns as a, b in the same four columns and use the given variances as equations (SM Illus. 8, 14).

WORKED PATTERN · SM ILLUSTRATION 8 (MISSING FIGURES)

- A and B 50 : 50 at ₹12 and ₹15; normal loss 10%; B used 70 kg; A bought at ₹15; cost variance 650 (A); yield 135 (A). [SM 378]
- Yield: 1,350 − (945 + 13.5a) = −135 → **a = 40 kg**; cost: 15a + 70b = 2,000 → **b = ₹20**. [SM 379]
- RSQSP 1,485 · AQSP 1,530 · AQAP 2,000 → mix **45 (A)**, usage **180 (A)**, price **470 (A)**. [SM 379]

OUR WORKINGS · JUN'26 Q5(a) AND DEC'25 Q5(a) (RECOMPUTED BY SCRIPT m05_patterns.py)

JUN'26 Q5(a) ZENITH: A 60 KG AT ₹150, B 40 KG AT ₹100, LOSS 5%

₹	SQ×SP	RSQ×SP	AQ×SP	AQ×AP
A	6,000 × 150	6,420 × 150	6,200 × 150	6,200 × 160
B	4,000 × 100	4,280 × 100	4,500 × 100	4,500 × 90
Total	13,00,000	13,91,000	13,80,000	13,97,000

Output 9,500 kg needs 10,000 kg input. Yield **91,000 (A)** · mix **11,000 (F)** · usage **80,000 (A)** · price **17,000 (A)** (A 62,000 A, B 45,000 F) · cost **97,000 (A)**.

DEC'25 Q5(a) DOXIN: FIND THE MISSING VARIANCES

- R usage 600 (A) = 30 (SQ − 70) → **standard input of R = 50 kg**; total standard 100, actual 110 → RSQ 55 each.
- Mix: P 24 (55 − 40) = 360 F; R 30 (55 − 70) = 450 A → **90 (A)** ✓ (given).
- Usage P = 24 (50 − 40) = **240 (F)**; price P = 40 (24 − 30) = **240 (A)**, R = 70 (30 − 40) = **700 (A)**.
- Cost P = 1,200 − 1,200 = **nil**; R = 1,500 − 2,800 = **1,300 (A)**.

PRACTISE THESE (MIX / YIELD FIRST)

J26, D25 Q5(a) · MQP Q5(a), PTP Q5(a) · SM Illus. 5–8, 11 (SM 373–383), 14 (sales, SM 385–387) · **ICMAI Practice Workbook Ch3 illus. 1–10** · MCQ bank Q16, Q55–Q59, Q65–Q67, Q187, Q189, Q192, Q208, Q235, Q250.

C Labour: gang mix, idle time · Q5 5.1

WORKED PATTERN · SM ILLUSTRATIONS 9 AND 10

- Illus. 9 gang (skilled 32 / semi 12 / unskilled 6 in the standard gang; 40-hour week; 1,800 standard hours produced): SRSH 4,536 · SRRSH 5,040 · SRAH 4,960 · ARAH 6,960 → mix **80 (F)**, efficiency **424 (A)**, rate **2,000 (A)**. [SM 380–381]
- Illus. 10: 800 idle hours × ₹100 = **₹80,000 (A)**; efficiency on hours worked: (6,000 − 5,700) × 100 = **₹30,000 (F)**. [SM 381]

Jun'24 Q5(a) Ront (our working): standard hours = units ÷ daily standard × 8-hour day (breaks are inside the standard): Type I 2,000 ÷ 8 × 8 = 2,000 h, Type II 1,200 ÷ 10 × 8 = 960 h → **standard cost ₹2,46,400**; paid 2,400 h × 90 + 1,200 h × 100 = 3,36,000 → **cost variance ₹89,600 (A)**.

⚠ JUN'24 Q5(a) IDLE TIME
"16 hours lost … as per expectation" while normal waiting is already inside the standard: state your reading (expected idle = no idle variance, or 16 h per worker × SR as idle) and split efficiency on the hours actually worked. No ICMAI answer in our files.

Practise: J24 Q5(a), D24 Q5 (power failure 4,000 h), MQP Q5 (gang) · SM Illus. 9, 10, 11 (labour part), 17 (SM 380–392) · MCQs J23 Q1(viii), J26 Q1(v) (actual hours from the rate / efficiency variance).

D Overheads: flexible budget, capacity, calendar, back-solving · Q5(b) 5.1

WORKED PATTERN · SM ILLUSTRATIONS 19 AND 12

- Illus. 19: 2 hours a unit, FOH ₹1 and VOH ₹0.20 an hour; 10,400 units → SH 5,200; AH 4,800. FOH cost **100 (F)** = volume 200 (F) + expenditure 100 (A); VOH cost **140 (F)** = 80 (F) on hours + expenditure 60 (F). [SM 393–394]
- Illus. 12 (calendar): 22 days v 20 → efficiency **18,480 (A)**, capacity **8,800 (F)**, calendar **16,000 (F)**, expenditure 8,000 (A). [SM 384–385]

⚠ SM WORDING

Illus. 19 calls the VOH hours variance a "volume" variance — it is the efficiency variance. SM 357 writes the FOH capacity variance per unit as SR × (budgeted − actual); work in hours: capacity = SR (AH − BH), efficiency = SR (SH − AH), F if positive.

Jun'24 Q5(b) Zosin (our working): flexible budget: variable 30,000 ÷ 2,000 = ₹15 a unit, fixed ₹60,000; 5 h a unit → VOH ₹3, FOH ₹1 an hour; SH 77,800, AH 74,000, BH 60,000. VOH efficiency **11,400 (F)**, expenditure 2,22,000 − 2,32,500 = **10,500 (A)**; FOH efficiency **3,800 (F)**, capacity **14,000 (F)**.

Dec'25 Q5(b) (our working, back-solve): expenditure = cost 2,800 A − volume 2,000 A = **800 (A)** → actual OH **12,800** → AH = 12,800 ÷ 8 = **1,600**; SR = 12,000 ÷ 2,400 = **₹5**; volume −2,000 = 5 (SH − 2,400) → **SH 2,000**; capacity 5 (1,600 − 2,400) = **4,000 (A)**; efficiency 5 (2,000 − 1,600) = **2,000 (F)**.

Practise: J24, D25 Q5(b), MQP / PTP Q5(b) · SM Illus. 12, 13, 19 (SM 384–394) · MCQs D23 Q1(x), D25 Q1(v) (FOH volume).

E The full set + reconciliation · 14-mark Q5 5.1

WORKED PATTERN · SM ILLUSTRATION 21 (OPERATING STATEMENT) · OUR D23, D24, J25 (RECOMPUTED BY SCRIPT)

Illus. 21 (2,000 units, standard profit ₹70,000): material price 1,550 A (on purchases), mix 866.67 A, yield 1,866.67 F; labour rate 2,100 F, efficiency 1,500 A, idle 1,000 A; VOH expenditure 8,600 F, efficiency 3,600 A; FOH expenditure 4,100 A, volume 2,500 A → **actual profit ₹67,450**; the ₹50 gap to the books = price variance on receipt (1,550) v on use (1,500). [SM 397–400]

DEC'23 Q5 DOTSON (OUR WORKING), ₹

Budgeted profit 2,000 × 40 · sales volume (1,800 − 2,000) × 40	80,000 · 8,000 A
Sales price 9,50,000 − 1,800 × 550	40,000 A
Material price 2,000 A · usage 10,000 F	8,000 F
Labour rate 20,000 A · efficiency 32,000 F	12,000 F
VOH expenditure 20,000 A · efficiency 16,000 F	4,000 A
FOH expenditure 2,000 F · volume 10,000 A	8,000 A
Actual profit (as given)	**40,000**

DEC'24 Q5 GINTECH (OUR WORKING), ₹

- Material price 66,000 A, usage 10,000 A; labour rate 6,800 A, **idle 4,000 h × 2 = 8,000 A**, efficiency (1,60,000 − 1,66,000) × 2 = 12,000 A.
- VOH (₹0.40 an hour) expenditure 6,400 F, efficiency 2,400 A; FOH expenditure 16,000 F, efficiency 6,000 A, capacity 34,000 A.
- Budget 3,20,000 − sales volume 64,000 A − cost variances 1,22,800 A = **1,33,200** ✓ (price variance nil: ₹140 both).

JUN'25 Q5 ZINTECH (OUR WORKING), ₹

Standard cost of 18,000 units **25,74,000**. Material price 76,000 F, usage 48,000 A; labour rate 16,800 A, efficiency 42,000 F; VOH expenditure 4,000 A, efficiency 12,000 F; FOH expenditure 30,000 A, volume 1,00,000 A → total **68,800 A** → actual **26,42,800** ✓.

PRACTISE

D23, D24, J25 Q5 in full · SM Illus. 20 (reverse: actuals from variances), 21, 17 (SM 389–400) · SM exercise (SM 411–416).

F Sales and profit variances · Q5(b), MCQs 5.1, 5.2

Jun'26 Q5(b) PIL (our working): budgeted profit X 25,000 × 12 + Y 20,000 × 12 + Z 15,000 × 16 = **₹7,80,000**; actual 20,000 × 12 + 22,000 × 6 + 16,000 × 18 = **₹6,60,000**. Cost variance (std − actual cost) × actual units = **68,000 A**; sales price = **32,000 A**; sales volume (actual − budget units) × standard profit = **20,000 A** → total 1,20,000 A ✓.

- **Planning v operating**: planning = original standard v revised standard (outside causes); operating = revised standard v actual. [SM 346–347]
- Ratios: efficiency, activity, calendar, capacity usage, capacity utilisation, idle time. [SM 358]

MCQ facts asked: standard cost and budgeted cost are interrelated, not interdependent (D25 xiii); more actual hours → higher capacity usage ratio (J26 xi); uniform costing cannot work where processes are unique (J26 xiii, 5.2 — SM 404–410, MCQ bank Q68, Q233).

SM ILLUSTRATIONS 14 AND 16

- Illus. 14 (sales missing figures): R standard 400 units, S actual 800 units; price variances R 1,500 F, S 4,000 F; S volume 6,000 F. [SM 385–387]
- Illus. 16 (profit variance statement with price indices): sales price 21.60 F, sales volume 12 A … from a profit of 5 to a loss of 4 (₹ lakh). [SM 388–389]

TRAPS

- Standard quantity / hours are for the **actual output**, never the budget.
- Labour rate on hours paid, efficiency on hours worked; idle is always adverse.
- Write F / A on every line and add a check line — half marks sit in the signs.
- Reconcile from **budgeted** profit (with the sales volume variance) or from standard profit on actual sales — say which.

⚠ SM SLIPS

Illus. 11: revised standard cost written 27,322 and 27,325; labour check adds "357 + 634" (643). Illus. 21: yield 1,866.67 printed as 1,866.40 in one column.