CA Final SPOM Set B – Strategic Cost & Performance Management
ICAI Module Questions Compilation

Chapter 13 - STANDARD COSTING

Illustration 1

HDR Ltd produces units and incurs labour costs. A change in technology after the preparation of the budget resulted in a 25% increase in standard labour efficiency, such that it is now possible to produce 10 units instead of 8 units using 8 hours of labour- giving a revised standard labour requirement of 0.80 hours per unit. Details of actuals and budgeted for period XII are:

Grade	Original Standards (ex-ante)		Revised Standards (ex-post)		Actual (1,100 units)	
X	1,100 units × 1 hrs. × ₹ 10	₹ 11,000	1,100 units × 0.80 hrs. × ₹ 10.00	₹ 8,800	1,200 hrs.× ₹ 8.50	₹ 10,200

Required

(i) Calculate the variances for 'X' by,
- **(a)** Traditional Variance Analysis; and
- **(b)** An approach which distinguishes between Planning and Operational Variances.

(ii) Comment on the results.

Solution

(i) (a) Traditional Variances

Efficiency Variance	=	(1,100 hrs. – 1,200 hrs.) × ₹10
	=	₹1,000 (A)
Rate Variance	=	(₹10 – ₹8.50) × 1,200 hrs.
	=	₹1,800 (F)
Total Variance	=	₹1,000 (A) + ₹1,800 (F) = ₹800 (F)

(b) Operational Variances

Efficiency Variance	=	(880 hrs. – 1,200 hrs.) × ₹10.00
	=	₹3,200 (A)
Rate Variance	=	(₹10.00 – ₹8.50) × 1,200 hrs.
	=	₹1,800 (F)
Total Variance	=	₹3,200 (A) + ₹1,800 (F) = ₹1,400 (A)

Planning Variances

Efficiency Variance	=	(1,100 hrs. – 880 hrs.) × ₹10
	=	₹2,200 (F)
Rate Variance	=	(₹10 – ₹10) × 880 hrs.
	=	₹0
Total Variance	=	₹2,200 (F) + ₹0 = ₹2,200 (F)

(ii) Comment

In this case, the separation of the labour cost variance into operational and planning components shows a large problem in the area of labour efficiency that might otherwise have been indicated.

The operational variances are based on the revised (ex post) standard, and this gives a more meaningful performance benchmark than the original (ex-ante) standard.

Illustration 2

N & S Co. (NSC) is a multiple product manufacturer. NSC produces the unit and all overheads are associated with the delivery of units to its customers.

Particulars	Budget	Actual
Overheads (₹)	4,000	3,900
Output (units)	2,000	2,100
Customer Deliveries (no.'s)	20	19

Required

Calculate Efficiency Variance and Expenditure Variance by adopting ABC approach.

Solution

Computation of Variances

Efficiency Variance = Cost Impact of undertaking activities more/ less than standard

= (21 deliveries* – 19 deliveries) × ₹200

= ₹400 F

$* \left(\frac{20 \text{ Deliveries}}{2{,}000 \text{ units}}\right) \times 2{,}100 \text{ units}$

Expenditure Variance = Cost impact of paying more/ less than standard for actual activities undertaken.

= 19 deliveries × ₹200 – ₹3,900

= ₹100 (A)

Illustration 3

City International Co. is a multiproduct firm and operates a standard costing and budgetary control system. During the month of June, the firm launched a new product. An extract from performance report prepared by Sr. Accountant is as follows:

Particulars	Budget	Actual
Output	30 units	25 units
Direct Labour Hours	180.74 hrs.	118.08 hrs.
Direct Labour Cost	₹ 1,19,288	₹ 79,704

Sr. Accountant prepared a performance report for the new product on certain assumptions but later on he realized that this new product has similarities with other existing product of the company. Accordingly, the rate of learning should be 80% and the learning would cease after 15 units. Other budget assumptions for the new product remain valid.

The original budget figures are based on the assumption that the labour has learning rate of 90% and learning will cease after 20 units, and thereafter the time per unit will be the same as the time of the final unit during the learning period, i.e. the 20th unit. The time taken for 1st unit is 10 hours.

Required

Show the variances that reconcile the actual labour figures with revised budgeted figures (for actual output) in as much detail as possible.

Note:

The learning index values for a 90% and a 80% learning curve are −0.152 and −0.322 respectively. [log 2 = 0.3010, log 3 = 0.47712, log 5 = 0.69897, log 7 = 0.8451, antilog of 0.6213 = 4.181, antilog of 0.63096 = 4.275]

Solution

Working Note

The usual learning curve model is

$$y = ax^b$$

where,

y	=	Average time per unit for x units
a	=	Time required for first unit
x	=	Cumulative number of units produced
b	=	Learning coefficient

W.N.1

Time required for first 15 units based on revised learning curve of 80% (when the time required for the first unit is 10 hours)

y	=	$10 \times (15)^{-0.322}$
log y	=	log 10 − 0.322 × log 15
log y	=	log 10 − 0.322 × log (5 × 3)
log y	=	log 10 − 0.322 × [log 5 + log 3]
log y	=	1 − 0.322 × [0.69897 + 0.47712]
log y	=	0.6213
y	=	antilog of 0.6213
y	=	4.181 hours
Total time for 15 units	=	15 units × 4.181 hours
	=	62.72 hours

Time required for first 14 units based on revised learning curve of 80% (when the time required for the first unit is 10 hours)

y	=	10 × (14) –0.322
log y	=	log10 − 0.322 × log 14
log y	=	log10 − 0.322 × log (2 × 7)
log y	=	log10 − 0.322 × [log 2 + log 7]
log y	=	1 − 0.322 × [0.3010 + 0.8451]
log y	=	0.63096
y	=	antilog of 0.63096
y	=	4.275 hrs.
Total time for 14 units	=	14 units × 4.275 hrs.
	=	59.85 hrs.

Time required for 25 units based on revised learning curve of 80% (when the time required for the first unit is 10 hours)

Total time for first 15 units	=	62.72 hrs
Total time for next 10 units	=	28.70 hrs. [(62.72 – 59.85) hours × 10 units]
Total time for 25 units	=	62.72 hrs. + 28.70 hrs
	=	91.42 hrs

W.N.2
Computation of Standard and Actual Rate

Standard Rate $= \frac{₹1,19,288}{180.75\ hr\ .}$

=₹660.00 per hrs.

Actual Rate $= \frac{₹79,704}{118.08\ hrs.}$

=₹675.00 per hrs.

W.N.3
Computation of Variances

Labour Rate Variance = Actual Hrs × (Std. Rate – Actual Rate)
= 118.08 hrs × (₹660.00 – ₹675.00)
= ₹1,771.20 (A)

Labour Efficiency Variance = Std. Rate × (Std. Hrs – Actual Hrs)
= ₹660 × (91.42 hrs – 118.08 hrs)
= ₹17,595.60 (A)

Statement of Reconciliation (Actual Figures Vs Budgeted Figures)

Particulars	₹
Actual Cost	79,704.00
Less: Labour Rate Variance (Adverse)	1,771.20
Less: Labour Efficiency Variance (Adverse)	17,595.60
Budgeted Labour Cost (Revised)*	60,337.20

*Budgeted Labour Cost (Revised)**
= Std. Hrs. × Std. Rate
= 91.42 hrs. × ₹ 660
= ₹ 60,337.20

Illustration 4

Well-known Footwear (WF) is a shop that focuses on shoes for various sports and activities like jogging, cricket, tennis, and hockey. Budgeted profit for the WF is calculated considering an average selling price of ₹ 500 per pair of shoes and an average cost of ₹ 350 per pair of shoes. The supervisor of the WF has discretion in staffing and in setting prices. Usually, the WF is staffed for 650 hrs. per month at a budgeted rate of ₹ 125 per hr. In addition to this base wages, sales staff gets a payment equal to 5.5% of takings. Moreover, staffing levels are not expected to change in response to "little" changes in shoe sales. For Sep'2023, the WF had budgeted sales of 2,250 pairs of shoes and 650 staffing hrs. Actual results for Sep'2023 were as follows:

Pairs of shoes sold	2,500
Revenue	12,00,000
Less: Cost of shoes	8,25,000
Less: Staff – additional payment	66,000
Less: Staff – base wages @₹ 125 per hour	78,125
Profit	₹ 2,30,875

Note- "little" changes in shoe sales specified as ± 12%.

Required

(i) Prepare a reconciliation statement of budgeted profit to actual profit.

(ii) Comment on supervisor's performance.

Solution

(i) Reconciliation Statement Budgeted and Actual Profit (Sep'2023)

Budgeted profit	1,94,375
Sales volume variance (F)	30,625
Sales price variance (A)	50,000
Shoe cost variance (F)	50,000
Staff cost variance -commission (F)	2,750
Staff cost variance -base wage (F)	3,125
Actual profit	₹2,30,875

(ii) Comment

The performance seems good. It shows that the supervisor of the WF passed on a 5.7% decrease in shoe cost to customers (same is also revealed through the entirely offsetting of the shoe cost variance and price variance), i.e., shoe costs decreased by ₹20 per pair, from a standard cost of ₹350 per pair to an actual cost ₹330 per pair. Additionally, the selling price decreased by ₹20 per pair, from a standard price of ₹500 per pair to an actual price of ₹480 per pair. In turn, the reduction in the selling price appeared to produce a favorable sales volume variance and a reasonable increase in profit.

Since the reduction in the selling price, staff commissions also were lower than budgeted. Moreover, the ₹50,000 reduction in revenue led to 0.055 × ₹50,000 = ₹2,750 less in commission costs.

Lastly, staffing was 25 hours under budget, leading to a savings of 25 × ₹125 = ₹3,125. Therefore, the supervisor attained an increase in sales with lesser staff hours.

Overall, it appears that the manager has done a great job of making revenue and controlling costs.

Workings

Statement Showing Budgeted and Actual Profit (Sep'2023)

	Budgeted Data	Actual Data
Units (pairs of shoes)	2,250	2,500
Price per pair of shoes	₹500.00	₹480.00
Cost per pair of shoes	₹350.00	₹330.00

Commission rate	₹27.50 (5.5% of ₹500)	₹26.40 (5.5% ₹480)
Contribution	₹122.50	₹123.60
Revenue	₹11,25,000	₹12,00,000
Less: Cost of shoes	7,87,500	8,25,000
Less: Staff – additional payment (commission)	61,875	66,000
Less: Staff – base wages	81,250	78,125
Profit	**₹1,94,375**	**₹2,30,875**

Computation of variances

Total Profit Variance = ₹2,30,875 – ₹1,94,375 = ₹36,500 (F)

Sales Contribution Volume Variance = Standard Contribution – Budgeted Contribution
= ₹122.50 × 2,500 – ₹122.50 × 2,250
= ₹3,06,250 – ₹2,75,625 = ₹30,625 (F)

Sales Price Variance = Actual Revenue – Standard Revenue
= ₹480 × 2,500 – ₹500 × 2,500
= ₹12,00,000 – ₹12,50,000 = ₹50,000 (A)

Shoe Cost Variance * = ₹350 × 2,500 – ₹330 × 2,500
= ₹8,75,000 – ₹8,25,000 = ₹50,000 (F)

Staff Cost Variance-commission* = ₹27.50 × 2,500 – ₹26.40 × 2,500
= ₹68,750 – ₹66,000 = ₹2,750 (F)

Staff Cost Variance (base wage) = ₹81,250 – ₹78,125 = ₹3,125 (F).

**Note – The Cost Variance for both shoe and staff commission equal to the difference between the standard cost and actual cost.*

Illustration 5

Osaka Manufacturing Co. (OMC) is a leading consumer goods company. The budgeted and actual data of OMC for the year 2023-24 are as follows-

Particulars	Budget	Actual	Variance
Sales / Production (units)	2,00,000	1,65,000	(35,000)
Sales (₹)	21,00,000	16,92,900	(4,07,100)
Less: Variable Costs (₹)	12,66,000	10,74,150	1,91,850
Less: Fixed Costs (₹)	3,15,000	3,30,000	(15,000)
Profit	5,19,000	2,88,750	(2,30,250)

The budgeted data shown in the table is based on the assumption that total market size would be 4,00,000 units but it turned out to be 3,75,000 units.

Required

Prepare a statement showing reconciliation of budget profit to actual profit through marginal costing approach for the year 2023-24 in as much detail as possible.

Solution

Statement of Reconciliation - Budgeted Vs Actual Profit

Particulars	₹
Budgeted Profit	5,19,000
Less: Sales Volume Contribution - Planning Variance (Adverse)	52,125
Less: Sales Volume Contribution - Operational Variance (Adverse)	93,825
Less: Sales Price Variance (Adverse)	39,600
Less: Variable Cost Variance (Adverse)	29,700
Less: Fixed Cost Variance (Adverse)	15,000
Actual Profit	2,88,750

Workings

Basic Workings

Budgeted Market Share (in %) = $\frac{₹2,00,000}{4,00,000}$

= 50%

Actual Market Share (in %) = $\frac{₹1,65,000}{3,75,000}$

= 44%

Budgeted Contribution = ₹21,00,000 –₹12,66,000

= ₹8,34,000

Average Budgeted Contribution (per unit) = $\frac{₹8,34,000}{2,00,000}$

= ₹4.17

Standard Sales Price per unit = $\frac{₹21,00,000}{2,00,000}$

= ₹10.50

Actual Sales Price per unit = $\frac{₹16,92,900}{1,65,000}$

= ₹10.26

Standard Variable Cost per unit = $\frac{₹12,66,000}{2,00,000}$

= ₹6.33

Actual Variable Cost per unit = $\frac{₹10,74,150}{1,65,000}$

= ₹6.51

CALCULATION OF VARIANCES

Sales Variances

Volume Contribution Planning* = Budgeted Market Share % × (Actual Industry

Sales Quantity in units – Budgeted Industry Sales Quantity in units) × (Average Budgeted Contribution per unit)
= 50% × (3,75,000 units – 4,00,000 units) × ₹4.17
= 52,125 (A)

Volume Contribution Operational** = (Actual Market Share % – Budgeted Market Share %) × (Actual Industry Sales Quantity in units) × (Average Budgeted Contribution per unit)
= (44% – 50 %) × 3,75,000 units × ₹4.17
= 93,825 (A)

Price = Actual Sales – Standard Sales
= Actual Sales Quantity × (Actual Price – Standard Price)
= 1,65,000 units × (₹10.26 – ₹10.50)
= 39,600 (A)

Variable Cost Variances

Cost = Standard Cost for Production – Actual Cost
= Actual Production × (Standard Cost per unit – Actual Cost per unit)
= 1,65,000 units × (₹6.33 – ₹6.51)
= ₹29,700(A)

Fixed Cost Variances

Expenditure = Budgeted Fixed Cost – Actual Fixed Cost
= ₹3,15,000 – ₹3,30,000
= ₹15,000 (A)

Illustration 6

Queensland Chemicals (QC) manufactures high-quality chemicals C-1, C-2 and C-3. Extracts from the budget for last year are given below:

	C-1	**C-2**	**C-3**
Sales Quantity (kg)	1,000	3,250	750
	₹/ kg	***₹/ kg***	***₹/ kg***
Average Selling Price	17,600	2,560	22,400
Direct Material (C2H6O) Cost	8,000	1,280	9,600
Direct Labour Cost	3,200	480	4,800
Variable Overhead Cost	320	48	480

The budgeted direct labour cost per hour was ₹ 160.

Actual results for last year were as follows:

	C-1	**C-2**	**C-3**
Sales Quantity (units)	900	3,875	975
	₹/ kg	***₹/ kg***	***₹/ kg***

Average Selling Price	19,200	2,480	20,000
Direct Material(C2H6O) Cost	8,800	1,200	10,400
Direct Labour Cost	3,600	480	4,800
Variable Overhead Cost	480	64	640

The actual direct labour cost per hour was ₹ 150. Actual variable overhead cost per direct labour hour was ₹ 20. QC follows just in time system for purchasing and production and does not hold any inventory.

Required

Interpret the Sales Mix Variance and Sales Quantity variance in terms of contribution.

Solution

Variance Interpretation

The sales quantity variance and the sales mix variance describe how the sales volume contribution variance has been affected by a change in the total quantity of sales and a change in the relative mix of products sold.

From the figures arrived for the sales quantity contribution variance, we can observe that the increase in total quantity sold would have gained an additional contribution of ₹2,124,600, if the actual sales volume had been in the budgeted sales proportion.

The sales mix contribution variance shows that the variation in the sales mix resulted in a curtailment in profit by ₹570,600. The change in the sales mix has resulted in a relatively higher proportion of sales of C-2 which is the chemical that earns the lowest contribution and a lower proportion of C-1 which earn a contribution significantly higher. The relative increase in the sale of C-3 however, which has the highest unit contribution, has partially offset the switch in mix to C-2.

Workings

Statement Showing Standard Contribution

	C-1 ₹/ kg	C-2 ₹/ kg	C-3 ₹/ kg
Average Selling Price	17,600	2,560	22,400
Direct Material (C2H6O) Cost	8,000	1,280	9,600
Direct Labour Cost	3,200	480	4,800
Variable Overhead Cost	320	48	480
Contribution	6,080	752	7,520

Sales Contribution Mix Variance

Product	Actual Quantity [AQ]	Actual Sales at Budgeted Proportion [RAQ]	Difference [AQ – RAQ]	Contribution ₹ [SC]	Mix Variance (₹' 000) SC × [AQ – RAQ]
C-1	900	1,150	250 (A)	6,080	1,520 (A)
C-2	3,875	3,737.50	137.50 (F)	752	103.40 (F)
C-3	975	862.50	112.50 (F)	7,520	846 (F)
	5,750	5,750			570.60 (A)

Sales Contribution Quantity Variance

Products	Budget Sales Quantity [BQ]	Actual Sales at Budgeted Proportion [RAQ]	Difference [RAQ – BQ]	Contribution ₹ [SC]	Qty. Variance (₹' 000) SC × [RAQ – BQ]
C-1	1,000	1,150	150 (F)	6,080	912 (F)
C-2	3,250	3,737.50	487.50 (F)	752	366.60 (F)
C-3	750	862.50	112.50 (F)	7,520	846 (F)
	5,000	5,750			2,124.60 (F)

Case Scenario 1

Natural Spices manufactures and distributes high-quality spices to gourmet food shops and top-quality restaurants. Gourmet and high-end restaurants pride themselves on using the freshest, highest-quality ingredients.

Natural Spices has set up five state-of-the-art plants to meet the ever- growing demand. The firm procures raw material directly from the centers of produce to maintain uniform taste and quality. The raw material is first cleaned, dried and tested with the help of special machines. It is then carefully grounded into the finished product passing through various stages and packaged at the firm's ultraclean factory before being dispatched to customers.

The following variances pertain to the last week of operations, arose as a consequence of management's decision to lower prices to increase volume.

Sales Volume Variance	18,000 (F)
Sales Price Variance	14,000 (A)
Purchase Price Variance	10,000 (F)
Labour Efficiency Variance	11,200 (F)
Fixed Cost Expenditure Variance	4,400 (F)

Required

(i) Identify the 'Critical Success Factors' for Natural Spices.

(ii) Evaluate the management's decision with the 'Overall Corporate Strategy' and 'Critical Success Factors'.

Solution

(i) Gourmet and high-end restaurants recognise Natural Spices on the basis of its high quality of spices. Therefore, quality is the most critical success factor of Natural Spices. There are other factors which cannot be ignored such as price, delivery options, attractive packing etc. But all are secondary to the quality.

(ii) Deliberate action of cutting price to increase sales volume indicates that firm is intending to expand its market to retail market and street shops which are price sensitive.

The Purchase Price Variance clearly indicating that the firm has purchased raw material at a lower price which may be due to buying lower quality material. Similarly, positive Efficiency Variance indicates cost cutting and stretching resources.

It appears that the firm is intending to expand its market to the retail market and street shops by not only reducing the price but also compromising its quality, which opposes its current strategy of high quality.

Management should monitor the trends of variances on a regular basis and take appropriate action in case of evidence of permanent decline in quality. Here, customer feedback is also very important.

TEST YOUR KNOWLEDGE

Question 1 - Planning and Operational Variances

Managing Director of Petro-KL Ltd (PTKLL) thinks that Standard Costing has little to offer in the reporting of material variances due to frequent changes in price of materials.

PTKLL can utilize one of two equally suitable raw materials and always plan to utilize the raw material which will lead to cheapest total production costs. However, PTKLL is frequently trapped by price changes and the material actually used often provides, after the event, to have been more expensive than the alternative which was originally rejected.

During the last accounting period, to produce a unit of 'P' PTKLL could use either 2.50 Kg of 'PG' or 2.50 kg of 'PD'. PTKLL planned to use 'PG' as it appeared it would be cheaper of the two and plans were based on a cost of 'PG' of ₹1.50 per Kg. Due to market movements, the actual prices changed and if PTKLL had purchased efficiently the cost would have been:

'PG' ₹2.25 per Kg;
'PD' ₹2.00 per Kg

Production of 'P' was 1,000 units and usage of 'PG' amounted to 2,700 Kg at a total cost of ₹ 6,480/-

Required

Calculate the material variance for 'P' by:

(i) Traditional Variance Analysis; and

(ii) An approach which distinguishes between Planning and Operational Variances.

Solution

(i) Traditional Variances

Usage Variance	= (2,500 Kg – 2,700 Kg) × ₹1.50
	= ₹300 (A)
Price Variance	= (₹1.50 – ₹2.40) × 2,700 Kg
	= ₹2,430 (A)
Total Variance	= ₹300 (A) + ₹2,430 (A)
	= ₹2,730 (A)

(ii) Operational Variances

Usage Variance	= (2,500 Kg – 2,700 Kg) × ₹2.25
	= ₹450 (A)
Price Variance	= (₹2.25 – ₹2.40) × 2,700 Kg
	= ₹405 (A)
Total Variance	= ₹450 (A) + ₹405 (A)
	= ₹855 (A)

Planning Variances

Controllable Variance	= (₹2.00 – ₹2.25) × 2,500 Kg
	= 625 (A)
Uncontrollable Variance	= (₹1.50 – ₹2.00) × 2,500 Kg
	= 1,250 (A)
Total Variance	= ₹625 (A) + ₹1,250 (A)
	= ₹1,875 (A)
Reconciliation	= ₹855 (A) + ₹1,875 (A)
	= ₹2,730 (A)

Note - A Planning Variance simply compares a revised standard to the original standard. An Operational Variance simply compares the actual results against the revised amount. Controllable Variances are those variances which arises due to inefficiency of a cost centre /department. Uncontrollable Variances are those variances which arises due to factors beyond the control of the management or concerned department of the organization.

Planning variances are generally not controllable. Where a revision of standards is required due to environmental/ technological changes that were not anticipated at the time the budget was prepared, the planning variances are truly uncontrollable. However, standards that failed to anticipate known market trends when they were set will reflect faulty standard-setting: it could be argued that these variances were controllable at the planning stage.

Question 2

Ski Slope had planned, when it originally designed its budget, to buy its artificial ice for ₹10/ per kg. However, due to subsequent innovations in technology, producers slashed their prices to ₹9.70 per kg. and this figure is now considered to be a general market price for the purpose of performance assessment for the budget period. The actual price paid was ₹9.50, as the Ski Slope procurement department negotiated strongly for a better price. The other information relating to that period were as follows:

Original Standards (ex-ante)		**Revised Standards (ex-post)**		**Actual (5,500 units)**	
5,500 units × 5 Kgs. × ₹10	₹2,75,000	5,500 units × 4.75 Kgs. × ₹9.70	₹2,53,412.50	27,225 Kgs. × ₹9.50	₹2,58,637.50

Required

(i) Calculate the variances for 'Ice' by
- a) Traditional Variance Analysis; and
- b) An approach which distinguishes between Planning and Operational Variances.

(ii) Interpret the result.

Solution

(i) (a) Traditional Variances

Usage Variance	=	(27,500 Kgs. – 27,225 Kgs.) × ₹10
	=	₹2,750 (F)
Price Variance	=	(₹10 – ₹9.50) × 27,225 Kgs.
	=	₹13,612.50 (F)

Total Variance	=	₹2,750 (F) + ₹13,612.50 (F)
	=	₹16,362.50 (F)

Operational Variances

Usage Variance	=	(26,125 Kgs. – 27,225 Kgs.) × ₹9.70
	=	₹10,670 (A)
Price Variance	=	(₹9.70 – ₹9.50) × 27,225 Kgs.
	=	₹5,445 (F)
Total Variance	=	₹10,670 (A) + ₹5,445 (F)
	=	₹5,225 (A)

Planning Variances

Usage Variance	=	(27,500 Kgs. – 26,125 Kgs.) × ₹10
	=	₹13,750 (F)
Price Variance	=	(₹10 – ₹9.70) × 26,125 Kgs.
	=	₹7,837.50 (F)
Total Variance	=	₹13,750 (F) + ₹7,837.50 (F) = ₹5,225 (A)

(iii) Interpretation

It is important to note that an innovation in technology is outside the control of Ski Slope and is, by nature, a planning 'error'. Equally, the better negotiation of a price should be recognized as an operational matter. Operational variances are self-evidently under the control of operational management, so operational efficiency must be assessed with only these figures in mind. The material procurement department has clearly done well by negotiating a price reduction beyond the market dip. One might question the quality of the ice, as the usage variance is adverse (possibly the ice fails to cover the field and so more is required). Obviously, the favourable price variance is smaller than the adverse usage variance, thus, overall performance is quite poor. A supervisor cannot assess variances in isolation from each other.

Question 3

KONY Ltd., based in Kuala Lumpur, is the Malaysian subsidiary of Japan's NY corporation, headquartered in Tokyo. KONY's principal Malaysian businesses include marketing, sales, and after-sales service of electronic products & software exports products. KONY set up a new factory in Penang to manufacture and sell integrated circuit 'Q50X-N'. The first quarter's budgeted production and sales were 2,000 units. The budgeted sales price and standard costs for 'Q50X-N' were as follows:

	RM	RM
Standard Sales Price per unit		50
Standard Costs per unit		
Circuit X (10 units @ RM 2.5)	25	
Circuit Designers (6 hrs. @ RM 2)	12	(37)
Standard Contribution per unit		13

Actual results for the first quarter were as follows:

	RM'000	RM '000
Sales (2,000 units)		158

Production Costs (2,000 units)		
Circuit X (21,600 units)	97.20	
Circuit Designers (11,600 hours)	34.80	(132)
Actual Contribution (2,000 units)		26

The management accountant made the following observations on the actual results–

"In total, the performance agreed with budget; however, in every aspect other than volume, there were huge differences. Sales were made at what was supposed to be the highest feasible price, but we now feel that we could have sold for RM 82.50 with no adverse effect on volume. The Circuit X cost that was anticipated at the time the budget was prepared was RM 2.5 per unit. However, the general market price relating to efficient purchases of the Circuit X during the quarter was RM 4.25 per unit. Circuit designers have the responsibility of designing electronic circuits that make up electrical systems. Circuit Designer's costs rose dramatically with increased demand for the specialist skills required to produce the 'Q50X-N', and the general market rate was RM 3.125 per hour - although KONY always paid below the normal market rate whenever possible. In my opinion, it is not necessary to measure the first quarter's performance through variance analysis. Further, our operations are fully efficient as the final contribution is equal to the original budget."

Required
Comment on management accountant's view.

Solution
Comment
As the management accountant states, and the analysis (W.N.1) presents, the overall variance for the KONI is nil. The cumulative adverse variances exactly offset the favourable variances i.e., sales price variance and circuit designer's efficiency variance. However, this traditional analysis does not clearly show the efficiency with which the KONI operated during the quarter, as it is difficult to say whether some of the variances arose from the use of incorrect standards, or whether they were due to efficient or inefficient application of those standards.

In order to determine this, a revised ex post plan should be required, setting out the standards that, with hindsight, should have been in operation during the quarter. These revised ex post standards are presented in W.N.2.

As seen from W.N.3, on the cost side, the circuit designer's rate variance has changed from adverse to favourable, and the price variance for circuit X, while remaining adverse, is signifi- cantly reduced in comparison to that calculated under the traditional analysis (W.N.1); on the sales side, sales price variance, which was particularly large and favourable in the traditional analysis (W.N.1), is changed into an adverse variance in the revised approach, reflecting the fact that the KONI failed to sell at prices that were actually available in the market.

Further, variances arose from changes in factors external to the business (W.N .4), which might not have been known or acknowledged by standard-setters at the time of planning are beyond the control of the operational managers. The distinction between variances is necessary to gain a realistic measure of operational efficiency.

W.N.1
KONY India Ltd.
Quarter-1

Operating Statement

Particulars	Favourable RM	Adverse RM	RM
Budgeted Contribution			26,000
Sales Price Variance [(RM 79 - RM 50) × 2,000 units]	58,000	---	
Circuit X Price Variance [(RM 2.50 – RM 4.50) × 21,600 units]		43,200	
Circuit X Usage Variance [(20,000 units - 21,600 units) × RM 2.50]		4,000	
Circuit Designer's Rate Variance [(RM 2 - RM 3) × 11,600 hrs.]		11,600	
Circuit Designer's Efficiency Variance [(12,000 hrs. - 11,600 hrs.) × RM 2.00]	800		NIL
Actual Contribution			26,000

W.N.2
Statement Showing Original Standards, Revised Standards, and Actual Results for Quarter 1

	Original Standards (ex-ante)		Revised Standards (ex-post)		Actual	
Sales	2,000 units × RM 50.00	RM 1,00,000	2,000 units × RM 82.50	RM 1,65,000	2,000 units × RM 79.00	RM 1,58,000
Circuit X	20,000 units × RM 2.50	RM 50,000	20,000 units × RM 4.25	RM 85,000	21,600 units × RM 4.50	RM 97,200
Circuit Designer	12,000 hrs. × RM 2.00	RM 24,000	12,000 hrs. × RM 3.125	RM 37,500	11,600 hrs. × RM 3.00	RM 34,800

W.N.3
Statement Showing Operational Variances

Particulars	RM	RM
Operational Variances		16,500 (A)
Sales Price [(RM 79.00 - RM 82.50) × 2,000 units]	7,000 (A)	
Circuit X Price [(RM 4.25 - RM 4.50) × 21,600 units]	5,400 (A)	
Circuit X Usage [(20,000 units – 21,600 units) × RM 4.25]	6,800 (A)	
Circuit Designer Rate [(RM 3.125 - RM 3.00) × 11,600 hrs.]	1,450 (F)	
Circuit Designer Efficiency [(12,000 hrs.– 11,600 hrs.) × RM 3.125]	1,250 (F)	

W.N.4
Statement Showing Planning Variances

Planning Variance		16,500 (F)
Sales Price [(RM 82.50 - RM 50.00) × 2,000 units]	65,000 (F)	
Circuit X Price [(RM 2.50 - RM 4.25) × 20,000 units]	35,000 (A)	
Circuit Designer Rate [(RM 2.00 - RM 3.125) × 12,000 hrs.]	13,500 (A)	

Question 4

AGF is a chemical processing company that produces sprays used by farmers to protect their crops. One of these sprays 'Agrofresh' is made by using either chemical A or chemical B. To produce one litre of Agrofresh spray they have the option to use either 12 l itres of chemical A or 12 litres of chemical B. During the financial year, the purchase department of AGF has planned to use chemical B as it appeared that it would be the cheaper of the two and their plans were based on a cost of chemical B of ₹15 per litre.

Due to subsequent market movement during the year the actual prices changed and if the concerned department had purchased efficiently, the cost would have been:

Chemical A	₹15.40 per litre
Chemical B	₹16.00 per litre

Production of Agrofresh spray was 1,000 litres and the usage of chemical B was 12,800 litres at a cost of ₹2,09,920.

You are the CEO of AGF and the management accountant has sent to you the following suggestions through e-mail:
"I feel that in our particular circumstances the traditional approach to variance analysis is of little use as for some of our products we can utilize one of several equally suitable chemicals and we always plan to use such chemical which will lead to cheapest production costs. However due to sharp market movements, we are frequently trapped by the sharp price changes which lead to the choice of expensive alternative at the end."

Required

To check the reality in the content of the mail, you asked, the management accountant of company:

(i) To Calculate the material variances for Agrofresh by using
- Traditional Variance Analysis
- Planning and Operational Variances

(ii) To Analyse how planning and operational variances approached the variances.

(iii) To Analyse how the advanced variances are useful to your organisation.

Solution

(i) Traditional Variances

Usage Variance	=	(12,000 lt. – 12,800 lt.) × ₹ 15.00
	=	₹ 12,000 (A)
Price Variance	=	(₹ 15.00 – ₹ 16.40) × 12,800 lt.
	=	₹ 17,920 (A)
Total Variance	=	₹ 12,000 (A) + ₹ 17,920 (A)
	=	₹ 29,920 (A)

Operational Variances

Usage Variance	=	(12,000 lt. – 12,800 lt.) × ₹ 16.00
	=	₹ 12,800 (A)
Price Variance	=	(₹ 16.00 – ₹ 16.40) × 12,800 lt.
	=	₹ 5,120 (A)
Total Variance	=	₹ 12,800 (A) + ₹5,120 (A)
	=	₹ 17,920 (A)

Planning Variances

Controllable Variance	=	(₹ 15.40 – ₹ 16.00) × 12,000 lt.
	=	₹ 7,200 (A)
Uncontrollable Variance	=	(₹ 15.00 – ₹15.40) × 12,000 lt.
	=	₹ 4,800 (A)
Total Variance	=	₹ 7,200 (A) + ₹ 4, 800 (A)
	=	₹ 12,000 (A)
Reconciliation	=	₹ 17,920 (A) + ₹ 12,000 (A)
	=	₹ 29,920 (A)

(ii) Traditional variance analysis is applied based on the assumption that whole of the variance is due to operational deficiencies and the planning associated with setting the original standard is perfectly correct. But this assumption is not practical. When the conditions are volatile and dynamic, traditional variances need to be analysed into planning and operational variances. Planning variances try to explain the extent to which the original standard needs to be adjusted to reflect changes in operating conditions between the current situation and that imagined when the standard was originally derived. Planning variances are generally not controllable and may need to revise to cater the changes due to environmental/ technological changes at a later stage. In certain situation planning variances can be considered controllable as well. Whereas operational variances explain the extent to which adjusted standards have been achieved. Operational variances are calculated after the planning variances have been established and are thus a realistic way of assessing performance. So, it indicates a reality check of traditional variance analysis.

In AGF, as per traditional approach total variances are ₹29,920 (adverse), out of which ₹17,920 (adverse) accounts for total operational variance and ₹12,000 (adverse) is for total planning variance. It is necessary to analyse planning variances further. The planning variance of ₹12,000 (adverse) can be divided into an uncontrollable adverse variance of ₹4,800 and a controllable adverse variance of ₹7,200. Similarly, total operational variance can be sub classified as adverse price variance of ₹5,120 and adverse usage variance of ₹12,800. This analysis gives a clearer indication of the inefficiency of the purchasing function by the concerned department. The performance of the staff of the purchasing department should be evaluated/ rewarded based on variances which are controllable. If an adverse uncontrollable variance of ₹4,800 is reported in the performance reports this is likely to lead to dysfunctional motivation effects to the purchase department.

(iii) In today's cutthroat competition, managers must react quickly and accurately to the changes in technology, price fluctuation, consumer tastes, laws and regulations, economic conditions, political conditions, and international conditions etc. which are changing rapidly and dramatically. Accordingly, management accountant should be able to provide necessary inputs by a proper analysis of the things that pertains to his/her area like effect of changes in price. The unique features of advanced variance analysis are that it considers different market conditions and changes in the dynamic environment.

Moreover, advanced variances classify variances into controllable and uncontrollable variances and help the management to find out reasons for adverse variances so that corrective action can be taken. Similarly, if any adverse variances have arrived, because of changes in the market condition like inflation, it has to be differentiated from the other variances.

AGF is a type of organization where management of performance can be done only through advanced variance analysis. Advanced variance analysis of AGF shows that it has adverse planning variance as well as adverse operational variance. Further, the emergence of controllable and uncontrollable variances makes it a perfect case of advance variance analysis in AGF. In AGF, sharp price changes which lead to the choice of expensive alternative and efficiency of purchase department need to be analyzed, reported, and dealt separately by the joint effort of the management accountant and the top management. Hence, advanced variance analysis in AGF is an absolute necessity.

Question 5 - Variance Analysis in Activity Based Costing

Krishna is Chief Financial Officer of millets.com, an internet company that enables customer to order for delivery of different millets by accessing its website. Krishna is concerned with the efficiency and effectiveness of the financial function. He collects the following information for three finance activities in 2023.

Rate per unit of Cost Driver

Activity	Activity Level	Cost Driver	Static Budget Amount (₹)	Actual Amount (₹)
Receivables	Output unit	Remittance	6.39	7.50
Payables	Batch	Invoices	29.00	28.00
Travel expenses	Batch	Travel claims	76.00	74.00

The output measure is the number of deliveries which is the same as the number of remittances. The following additional information are also given:

	Budgeted	Actual
Number of deliveries	10,00,000	9,48,000
Delivery Batch size	5	4.468
Travel expenses Batch size	500	501.587

Required

Calculate the flexible budget variances for 2023 to :

(i) Receivable Activities

(ii) Payable Activities

(iii) Travel expense Activities

(Ignore fractions in all calculations)

Solution

Activity-based costing, flexible-budget variances for finance function activities:

(i) Receivables

'Receivables' is an output unit level activity. Its flexible-budget variance can be calculated as follows:

Flexible Budget Variance

= Flexible Budget Costs – Actual Costs

= ₹6.39 × 9,48,000 – ₹7.50 × 9,48,000

= ₹60,57,720 – ₹71,10,000

= ₹10,52,280 (A)

(ii) Payables

'Payables' is a batch level activity.

	Static-Budget Amounts	Actual Amounts
a. Number of deliveries	10,00,000	9,48,000
b. Batch size (units per batch)	5	4.468
c. Number of batches (a / b)	2,00,000	2,12,175
d. Cost per batch	₹29	₹28
e. Total payables activity cost (c×d)	₹58,00,000	₹59,40,900

Step 1: The number of batches in which payables should have been processed
= 9,48,000 actual units / 5 budgeted units per batch
= 189,600 batches

Step 2: The flexible-budget amount for payables
= 1,89,600 batches × ₹29 budgeted cost per batch
= ₹54,98,400

The flexible-budget variance can be computed as follows:

Flexible-Budget Variance
= Flexible-Budget Costs – Actual Costs
= 1,89,600 × ₹29 – 2,12,175 × ₹28
= ₹54,98,400 – ₹59,40,900
= ₹4,42,500 (A)

(iii) Travel Expenses

Travel expenses is a batch level activity.

	Static-Budget Amounts	Actual Amounts
a. Number of deliveries	10,00,000	9,48,000
b. Batch size (units per batch)	500	501.587
c. Number of batches (a / b)	2,000	1,890
d. Cost per batch	₹76	₹74
e. Total travel expenses activity cost (c×d)	₹1,52,000	₹1,39,860

Step 1: The number of batches in which the travel expense should have been processed
= 948,000 actual units/ 500 budgeted units per batch
= 1,896 batches

Step 2: The flexible-budget amount for travel expenses
= 1,896 batches × ₹76 budgeted cost per batch
= ₹1,44,096

The flexible budget variance can be calculated as follows:

Flexible Budget Variance
= Flexible-Budget Costs – Actual Costs
= 1,896 × ₹76 – 1,890 × ₹74
= ₹1,44,096 – ₹1,39,860
= ₹4,236 (F)

Question 6

WDG Limited uses activity-based costing to allocate variable manufacturing overhead costs to products. The company identified three activities with the following information for last quarter:

Activity	Standard Rate	Standard Quantity per unit produced	Actual Costs	Actual Quantity
Indirect Materials	₹20 per kilogram	0.5 kilogram per unit	₹9,40,000	48,000 kilograms
Product Testing	₹3 per test minute	10 minutes per unit	₹22,50,000	7,40,000 test minutes
Energy	₹0.20 per minute of machine time	4 minutes of machine time per unit	₹70,000	3,60,000 minutes of machine time

The company produced 80,000 units in the last quarter. Company policy is to investigate all variances above 5% of the flexible budget amount for each activity.

Required

(i) Calculate variable overhead expenditure variance and variable overhead efficiency variance for each of the activities using activity-based costing. Clearly indicate each variance as favourable or unfavourable / adverse.

(ii) Interpret the results of variable overhead efficiency variance as calculated in (i) above in respect of indirect materials and product testing activity.

(iii) Identify the variances that should be investigated according to company policy. Show calculations to support your answer.

Solution

(i) Indirect Materials

Efficiency Variance = Cost Impact of undertaking activities more/ less than standard
= (0.50kg. × 80,000units – 48,000 kg.) × ₹20
= ₹1,60,000 (A)

Expenditure Variance = Cost impact of paying more/ less than standard for actual activities undertaken
= 48,000kg. × ₹20 – ₹9,40,000
= ₹20,000 (F)

Product Testing

Efficiency Variance = Cost Impact of undertaking activities more/ less than standard
= (10 mins. × 80,000 units – 7,40,000 mins.) × ₹3
= ₹1,80,000 (F)

Expenditure Variance = Cost impact of paying more/ less than standard for actual activities undertaken
= 7,40,000mins × ₹3 – ₹22,50,000
= ₹30,000 (A)

Energy

Efficiency Variance = Cost Impact of undertaking activities more/ less than standard
= (4 mins. × 80,000 units – 3,60,000 mins.) × ₹0.20
= ₹8,000 (A)

Expenditure Variance = Cost impact of paying more/ less than standard for actual activities undertaken
= 3,60,000mins × ₹0.20 – ₹70,000
= ₹2,000 (F)

(ii) Indirect Materials

WDG actually spent 48,000 kg. or 8,000 kg. more than the standard allows. At a predetermined rate of ₹20 per kg., efficiency variance is 1,60,000 (A). Since the actual quantity was higher than the standard, the variance is unfavorable. This adverse variance, could have been caused by the inferior quality, result of carelessness handling of materials by production workers or could be as a result of change in methods of production, product specifications or the way in which quality of the product is checked or controlled.

Product Testing

Favorable efficiency variance amounting to Rs. 1,80,000 indicates that fewer testing minutes were expended during the quarter than the standard minutes required for the level of actual output. This may be due to employment of a higher skilled labor or improvement of skills of existing workforce through training and development leading to improved productivity etc

(iii) Flexible Budget

Indirect Materials	= (0.50 kg. × 80,000 units) × ₹20 = ₹8,00,000	= ₹8,00,000× 5% = ₹40,000
Product Testing	= (10 mins. × 80,000 units) × ₹3 = ₹24,00,000	= ₹24,00,000 × 5% = ₹1,20,000
Energy	= (4 mins. × 80,000) × ₹0.20 = ₹64,000	= ₹64,000 × 5% = ₹3,200

Efficiency Variance for all the three activities are more than 5% of their flexible budget amount. So, according to the company policy, efficiency variances should be investigated.

Alternatively, Statement Showing Identification of Variances to be investigated

	Calculation	**Variance % of Flexible Budget**	**Criteria**	**Investigate Y or N**
Indirect Materials				
Efficiency Variance	$\left(\frac{1,60,000}{8,00,000} \times 100\right)$	20%	5%	Y

Expenditure Variance	$\left(\frac{20,000}{8,00,000} \times 100\right)$	2.5%	5%	N
Product Testing				
Efficiency Variance	$\left(\frac{1,80,000}{24,00,000} \times 100\right)$	7.5%	5%	Y
Expenditure Variance	$\left(\frac{30,000}{24,00,000} \times 100\right)$	1.25%	5%	N
Energy				
Efficiency Variance	$\left(\frac{8,000}{64,000} \times 100\right)$	12.5%	5%	Y
Expenditure Variance	$\left(\frac{2,000}{64,000} \times 100\right)$	3.125%	5%	N

Question 7

JPY Limited produces a single product. It has recently automated part of its manufacturing plant and adopted Total Quality Management (TQM) and Just-in- Time manufacturing system. No inventories are held for material as well as for finished product. The company currently uses standard absorption costing system. Following are related to fourth quarter of 2023-24:

	Budget	**Actual**
Production and Sales	1,00,000 units	1,10,000 units
Direct Materials	2,00,000 kg. @ ₹30/kg	2,50,000 kg. @ ₹31.20/kg.
Direct Labour Hours	25,000 hrs. @ ₹300/ hr	23,000 hrs. @ ₹300/ hr.
Fixed Production Overhead	₹3,20,000	₹3,60,000

Production overheads are absorbed on the basis of direct labour hours.
The CEO intends to introduce activity-based costing system along with TQM and JIT for better cost management. A committee has been formed for this purpose. The committee has further analysed and classified the production overhead of fourth quarter as follows:

	Budget	**Actual**
Costs:		
Material Handling	₹96,000	₹1,24,000
Set Up	₹2,24,000	₹2,36,000
Activity:		
Material Handling (orders executed)	8,000	8,500
Set Up (production runs)	2,000	2,100

Revision of standards relating to fourth quarter were made as below:

	Original Standard	**Revised Standard**
Material Content per unit	2 kg	2.25 kg
Cost of Material	₹30 per kg	₹31 per kg
Direct Labour Hours	15 minutes	12 minutes

Required

(i) Calculate Planning and Operational Variances relating to material price, material usage, labour efficiency, and labour rate.

(ii) Calculate overhead expenditure and efficiency variance using Activity Based Costing principles.

Solution

(i) Workings

Factor	Original Standards (ex-ante)		Revised Standards (ex-post)		Actual (1,10,000 units)	
Material	1,10,000 units ×2 kgs. × ₹ 30	₹66,00,000	1,10,000 units×2.25 kgs. × ₹ 31	₹76,72,500	2,50,000 kgs. × ₹ 31.20	₹78,00,000
Labour	1,10,000 × 15/60 hrs.× ₹ 300	₹82,50,000	1,10,000 × 12/60 hrs.× ₹ 300	₹66,00,000	23,000 hrs.× ₹ 300	₹69,00,000

Material

Traditional Variances

Usage Variance	=	(2,20,000 Kgs. – 2,50,000 Kgs.) × ₹30
	=	₹9,00,000 (A)
Price Variance	=	(₹30.00 – ₹31.20) × 2,50,000 Kgs.
	=	₹3,00,000 (A)
Total Variance	=	₹9,00,000 (A) + ₹3,00,000 (A)
	=	₹12,00,000 (A)

Planning Variances

Usage Variance	=	(2,20,0000 Kg. – 2,47,500 Kg.) × ₹30
	=	₹8,25,000 (A)
Price Variance	=	(₹30 – ₹31) × 2,47,500 Kgs.
	=	₹2,47,500 (A)
Total Variance	=	₹8,25,000 (A) + ₹2,47,5000 (A)
	=	₹10,72,500 (A)

Operational Variances

Usage Variance	=	(2,47,500 Kg. – 2,50,000 Kg.) × ₹31
	=	₹77,500 (A)
Price Variance	=	(₹31.00 – ₹31.20) × 2,50,000 Kg.
	=	₹50,000 (A)
Total Variance	=	₹77,500 (A) + ₹50,000 (A)
	=	₹1,27,500 (A)

Note - Direct Material Usage Operational Variance using Standard Price, and the Direct Material Price Planning Variance based on Actual Quantity can also be calculated. This approach reconciles the Direct Material Price Variance and Direct Material Usage Variance calculated in part.

Labour

Traditional Variances

Efficiency Variance	= (27,500 hrs. – 23,000 hrs.) × ₹300
	= ₹13,50,000 (F)
Rate Variance	= (₹300 – ₹300) × 23,000 hrs.
	= NIL
Total Variance	= ₹13,50,000 (F) + NIL
	= ₹13,50,000 (F)

Planning Variances

Efficiency Variance	= (27,500 hrs. – 22,000 hrs.) × ₹300
	= ₹16,50,000 (F)
Rate Variance*	= (₹300 – ₹300) × 22,000 hrs.
	= NIL
Total Variance	= ₹16,50,000 (F) + 0
	= ₹16,50,000 (F)

Operational Variances

Efficiency Variance	= (22,000 hrs. – 23,000 hrs.) × ₹300
	= ₹3,00,000 (A)
Rate Variance	= (₹300 – ₹300) × 23,000 hrs.
	= NIL
Total Variance	= ₹3,00,000 (A) + 0
	= ₹3,00,000 (A)

Note - Direct Labour Efficiency Operational Variance using Standard Rate, and the Direct Labour Rate Planning Variance based on Actual Hours can also be calculated. This approach reconciles the Direct Labour Rate Variance and Direct Labour Efficiency Variance calculated in part.

(**ii) Material Handling**

Efficiency Variance

= Cost Impact of undertaking activities more/ less than standard
= (8,800 orders* – 8,500 orders) × ₹12
= ₹3,600 (F)

$$* \left(\frac{8{,}000\ orders}{1{,}00{,}000\ units}\right) \times 1{,}10{,}000\ units$$

Expenditure Variance

= Cost impact of paying more/ less than standard for actual activities undertaken
= 8,500 orders × ₹12 – ₹1,24,000
= ₹22,000 (A)

Setup

Efficiency Variance

= Cost Impact of undertaking activities more/ less than standard
= (2,200 runs* – 2,100 runs) × ₹112
= ₹11,200 (F)

$$* \left(\frac{2{,}000\ orders}{1{,}00{,}000\ units}\right) \times 1{,}10{,}000\ units$$

Expenditure Variance

= Cost impact of paying more/ less than standard for actual activities undertaken
= 2,100 runs × ₹112 – ₹2,36,000
= ₹800 (A)

Question 8 - Reconciliation of Profit

Established in the year 1999, FF Company is the pioneer of fast food in Southampton. It delivers a truly fresh, affordable, made to order sandwiches, burger, and other meal in a friendly and relaxed environment. The popularity of the sandwiches, burger etc. continued to grow over the decades but one thing remained the same and that was its core values and principles:

- Always provide exceptional service to valued guests;
- Provide the highest quality menu items at a price everyone can afford and enjoy; and
- Keep operating costs low and ensure to have great systems in place and never stop improving.

It provides a comfortable place for people to unwind over interesting conversations. From the beginning, as it continues to grow, it is guided by passion for delighting customers by serving fresh, delicious food right in front of customer.

The performance report* for FY 2023-24 was presented at the management committee meeting as follows:

Particulars	Budget	Actual	Variance
Sales / Production (no. of burgers)	2,00,000	1,65,000	(35,000)
Sales (£)	10,50,000	8,46,450	(2,03,550)
Less: Variable Costs (£)	6,33,000	5,37,075	95,925
Less: Fixed Costs (£)	1,57,500	1,65,000	(7,500)
Profit	2,59,500	1,44,375	(1,15,125)

The Management Accountant of FF believed that the size of the fast-food market deriving the budget number of burgers to be sold is over-estimated. He has computed the value of the sales volume contribution planning variance to be 26,062.50 adverse.

Further, the report also included customer's feedback and the majority of comments were regarding delay in service time. One of feedback was as follows:
"I ordered two burgers at 2:10 pm. After half an hour (30 minutes) of waiting I called the waiter and asked him what happened? he told me that he will check with kitchen. I got the order after 45 minutes of waiting, this cafe is not good in delivery time"

The budgeted data shown in the table is based on the assumption that total market size would be 4,00,000 units.

Required

(i) Prepare a reconciliation statement of budgeted profit to actual profit through marginal costing approach in as much detail as possible.
(ii) Explain the implications of the reconciliation statement.
(iii) Management is worried about customer's feedback. ADVISE measures to improve delivery service time.

Solution

(i) Statement of Reconciliation - Budgeted Vs Actual Profit

Particulars	£
Budgeted Profit	2,59,500
Less: Sales Volume Contribution - Planning Variance (Adverse)	26,062.50
Less: Sales Volume Contribution - Operational Variance (Adverse)	46,912.50
Less: Sales Price Variance (Adverse)	19,800
Less: Variable Cost Variance (Adverse)	14,850
Less: Fixed Cost Variance (Adverse)	7,500
Actual Profit	1,44,375

Workings

Basic Workings

Budgeted Market Share (in %) = $\frac{2,00,000}{4,00,000} = 50\%$

Budgeted Contribution = £10,50,000 – £6,33,000 = £4,17,000

Average Budgeted Contribution (per unit)

= $\frac{£4,17,000}{2,00,000} = £2.085$

Volume Contribution Planning = Budgeted Market Share % × (Actual Industry Sales Quantity in units – Budgeted Industry Sales Quantity in units) × (Average Budgeted Contribution per unit)

⇒ £26,062.50 (A) = 50% × (Actual Industry Sales Quantity in units – 4,00,000 units) × £2.085

⇒ Actual Industry Sales Quantity = 3,75,000 units

Actual Market Share (in %) = $\frac{1,65,000}{3,75,000}$ = 44%

Standard Sales Price per unit = $\frac{£10,50,000}{2,00,000}$ = £5.25

Actual Sales Price per unit = $\frac{£8,46,000}{1,65,000}$ = £5.13

Standard Variable Cost per unit = $\frac{£6,33,000}{2,00,000}$ = £3.165

Actual Variable Cost per unit = $\frac{£5,37,075}{1,65,000}$ = £3.255

Calculation of variances

Sales Variances

Volume Contribution Operational = (Actual Market Share % – Budgeted Market Share %) × (Actual Industry Sales Quantity in units) × (Average Budgeted Contribution per unit)

= (44% – 50 %) × 3,75,000 units × £2.085

= £46,912.50 (A)

Price	=	Actual Sales – Standard Sales
	=	Actual Sales Quantity × (Actual Price– Standard Price)
	=	1,65,000 units × (£5.13 – £5.25)
	=	£19,800 (A)

Variable Cost Variances

Cost	=	Standard Cost for Production – Actual Cost
	=	Actual Production × (Standard Cost per unit– Actual Cost per unit)
	=	1,65,000 units × (£3.165 – £3.255)
	=	£14,850 (A)

Fixed Cost Variances

Expenditure	=	Budgeted Fixed Cost – Actual Fixed Cost
	=	£1,57,500 – £1,65,000
	=	£7,500 (A)

(ii) Implications of Reconciliation Statement

In the revised statement, the sales volume variance has been detailed by the way of two variances i.e., planning and operational variances. This kind of detailed information assists the company to check, which kind of variances are under the management control, and which are not. FF has adverse volume contribution planning variance, and the reason could be the environmental / market changes, that was not anticipated at the time of budget preparation, so they are not under management control and hence, no one is responsible for this. On the other hand, the sales volume contribution operational variance was under control of the managers, and they should be held responsible for the same. The reason of adverse sales volume contribution operational variance could be unsuccessful direct selling efforts/marketing efforts. FF has adverse sales price variance as well. It indicates that the burgers were sold for lower price than standard. The reason of this could be unforeseen market competitive price, tapping new market etc.

Further, revised reconciliation statement delivers little information about the variable cost and fixed cost variances. They both are adverse. Fixed cost consists of many items such as salaries, annual maintenance cost, rent and insurance etc. Often fixed cost items are not affected in short run in response to change in the level of activity, but they might change in response to other factors such as price. This may cause increase expenditure on fixed overheads. A meaningful analysis of fixed cost variance requires a line to line comparison of budgeted cost with actual cost.

In case of FF, the variable cost may be made up of large individual different items such as vegetables, gas, indirect labour, regular maintenance cost etc. Control of variable cost also requires line by line analysis for each individual item. The adverse variable cost variance simply reveals that FF incurred more on variable cost than expected. However, it is necessary to take into consideration the causes of this adverse variance, which is beyond the control of the management, for instance, the unusual price hike in vegetables in case of unseasonal rainfall.

(iii) Measures to Improve Fast Food Delivery Service Time

Customers expect that their food order to be delivered quickly. From customer's feedback in the question, it is evident that FF has a problem in food delivery, due to which, customers go unsatisfied. The reason of late delivery could be non- availability of raw material on time or

employees not working properly etc. The reason of employees not working properly could be job dissatisfaction which may be due to improper working conditions, low salary, or no reward for overtime etc.

In order to reduce delivery time, raw material should be made available in stock based on daily requirement. FF may follow quantitative approach to inventory problems, which lays down clear guidelines that when to re-order or alert the management in exceptional situations.
In addition, FF must also address the issues related to employee and involve them in a loop. FF could improve the employee satisfaction with proper working conditions, better pay, training, and growth opportunities.

Moreover, it is important that customers should be informed about approximate delivery time since this will reduce customer's anxiety and will proactively reduce any complaints over long waits for delivery of food. If unexpected delays occur, it is important to communicate with customers, apologies for the delay and inform them about the new approximate delivery time along with valid reason.

In addition to this, FF can also introduce pagers or install electronic board displaying ticket number or self- serve kiosk allowing customers to roam around or order in advance so that they do not have long waiting time.

Question 9 - Interpretation of Variances

NZSCO Ltd. uses a standard costing system for manufacturing its single product 'ANZ'.
Standard Cost Card per unit is as follows:

	(₹)
Direct Material (1 kg per unit)	20
Direct Labour (6 hrs @ ₹8 per hour)	48
Variable Overheads	24

Actual and Budgeted Activity Levels in units for the month of Feb' 24 are:

	Budget	Actual
Production	50,000	52,000

Actual Variable Costs for the month of Feb'24 are given as under:

Direct Material	10,65,600
Direct Labour (3,00,000 hrs)	24,42,000
Variable Overheads	12,28,000

Required
Interpret Direct Labour Rate and Efficiency Variances.

Solution
Interpretation

Direct Labour Rate Variance
Adverse Labour Rate Variance indicates that the labour rate per hour paid is more than the set standard. The reason may include among other things such as:

(1) While setting standard, the current/ future market conditions like pending labour negotiation/ cases, has not been considered (or predicted) correctly.
(2) The labour may have been told that their wage rate will be raised, or a bonus will be paid if they work efficiently.

Direct Labour Efficiency Variance

It indicates that the workers have produced actual production quantity in less time than the time allowed. The reason for favourable labour efficiency variance may include among the other things as follows:

(1) While setting standard, workers efficiency could not be estimated properly, this may happen due to non-observance of time and motion study.
(2) The workers may be new in the factory; hence, efficiency could not be predicted properly.
(3) The foreman or personnel manager responsible for labour efficiency, while providing his/ her input at the time of budget/ standard, has adopted conservative approach.
(4) The increase in the labour rate might have encouraged the labours to do work more efficiently.

In this particular case, it may have happened that since labour payment has been increased labour efficiency has also been increased. In a nutshell because of additional labour rate (Adverse), labour efficiency has gone up (Favourable)

Workings

Labour Rate Variance = Standard Cost of Actual Time – Actual Cost
= (SR × AH) – (AR × AH)
Or
= (SR – AR) × AH
= (₹8.00 – ₹8.14*) × 3,00,000 hrs.
= ₹42,000 (A)

(*)

Actual Labour Rate per hour = $\frac{\text{Actual paid}}{\text{Actual Hours}}$

= $\frac{₹24,42,000}{₹3,00,000 \text{ hrs}}$

= ₹8.14

Labour Efficiency Variance = Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time
= (SH × SR) – (AH × SR)
Or
= (SH – AH) × SR
= (3,12,000$ hrs. – 3,00,000 hrs.) × ₹8.00
= ₹96,000 (F)

Standard Hours = Actual Production × Std. hrs. per unit
= 52,000 units × 6 hrs.
= 3,12,000 hrs.

Question 10

T-tech is a Taiwan based firm, that designs, develops, and sells audio equipment. Founded in 1975 by Mr. Boss, firm sells its products throughout the world. T-tech is best known for its home audio systems and speakers, noise cancelling headphones, professional audio systems and automobile sound systems. Extracts from the budget are shown in the following table:

Home Audio System Division
Jan'2024

System	Sales (units)	Selling Price ₹	Standard Cost (per System) ₹
3,000 W PMPO	1,500	18,750	12,500
5,000 W PMPO	500	50,000	26,250

The Managing Director has sent you a copy of an email he received from the Sales Manager 'K'. The content of the email was as follows:

"We have had an outstanding month. There was an adverse Sales Price Variance on the 3,000 W PMPO Systems of ₹ 22,50,000 but I compensated for that by raising the price of 5,000 W PMPO Systems. Unit sales of 3,000 W PMPO Systems were as expected but sales of the 5,000 W PMPOs were exceptional and gave a Sales Margin Volume Variance of ₹ 23,75,000. I think I deserve a bonus!"
The managing Director has asked for your opinion on these figures. You got the following information:

Actual results for Jan' 2024 were:

System	Sales (units)	Selling Price ₹
3,000 W PMPO	1,500	₹17,250
5,000 W PMPO	600	₹53,750

The total market demand for 3,000 W PMPO Systems was as budgeted but as a result of suppliers reducing the price of supporting UHD TV System the total market for 5,000 W PMPO Systems raised by 50% in Jan'2024.
The company had sufficient capacity to meet the revised market demand for 750 units of its 5,000 W PMPO Systems and therefore maintained its market share.

Required

(i) Calculate the following Operational Variances based on the revised market details:
- Sales Margin Mix Variance
- Sales Margin Volume Variance

(ii) Comment briefly on the measurement of the K's performance.

Solution

(i) Statement Showing Sales Margin Mix Variance

System	Standard Margin per unit (₹)	Actual Qty. (units)	Revised Actual Quantity (units)	Difference	Variance (₹)
3,000 W PMPO	6,250	1,500	1,400	+100	+6,25,000 (F)
5,000 W PMPO	23,750	600	700	-100	23,75,000 (A)
Total		2,100			17,50,000 (A)

Statement Showing Sales Margin Volume Variance

System	Standard Margin per unit (₹)	Actual Qty. (units)	Budgeted Quantity (units)	Difference	Variance (₹)
3,000 W PMPO	6,250	1,500	1,500	0	-
5,000 W PMPO	23,750	600	750	-150	35,62,500 (A)
Total		2,100			35,62,500 (A)

(ii) A Planning Variance simply compares a revised standard (that should or would have been used if planners had known in advance what was going to happen) to the original standard. A planning variance is considered as not to be controllable by management.

The market size is not within the control of the sales manager and therefore variances caused by changes in the market size would be regarded as planning variances.

However, variances caused by changes in the selling prices and consequently the selling price variances and market shares would be within the control of the sales manager and treated as operating variances.
The market size variance compares the original and revised market sizes. This is unchanged for 3,000 W PMPO Systems so the only variance that occurs relates to the 5,000 W PMPO Systems and is ₹59,37,500 (F) [250 systems × ₹23,750].

It is vital to make this distinction because as can be seen from the scenario the measurement of the 'K''s performance is incomplete if the revised market size is ignored.

The favourable volume variance of ₹23,75,000 referred to in the 'K''s e-mail is made up of two elements, one of which, the market size, is a planning variance which is outside his control. It is this that has caused the overall volume variance to be favourable, and thus 'K' is not responsible for the overall favourable performance.

Note - It has been stated in the question that "The total market demand for 3,000 W PMPO Systems was as budgeted but as a result of suppliers reducing the price of supporting UHD TV System the total market for 5,000 W PMPO Systems raised by 50% in Jan'2024. The company had sufficient capacity to meet the revised market demand for 750 units of its 5,000 W PMPO Systems and therefore maintained its market share. Thus, Budgeted Ratio has been taken 2:1 (1,500:750) instead of 3:1 (1,500:500) for computation of "Revised Actual Quantity (RAQ)".

Question 11

Aquatic Feed (AF) is the leading manufacturer of fish and other sea animal feed. AF has made its credit pioneering effort and service for over one decade in development of culture, processing and exports with its state-of-art fish feed and processing plants. Hallmark of AF is constant upgradation of aquaculture technology bringing latest developments in the field to the doorstep of the Indian aquaculture farmer. It stands as a leading provider of high quality feed, best technical support to the farmer and caters to the quality standards of global customers.

One of its fish feed product is "B" which is produced by mixing and heating three ingredients: B1, B2 and B3. It uses a standard costing system to monitor its costs.

The standard material cost for 100 Kg. of "B" is as follows:

Ingredients	Standard Qty. (Kg)	Cost per Kg. (₹)	Cost per 100 Kg. of "B" (₹)
B1	42	3	126
B2	62	6	372
B3	21	2	42
	125		540

Notes

- B1, B2 and B3 are agricultural products. Their quality and price change significantly every year. Standard prices are determined at the average market price over the last three years. AF has a purchasing manager responsible for purchasing and pricing.

- The standard mix is decided by the Managing Partner having 15 years' rich experience in aquaculture field. The last time this was done at time of launching the "B" that was six years back. The standard mix has not been changed since.
- Mixing and heating process are subject to some evaporation loss.

In current month 4,605 Kg. of "B" was produced, using the following ingredients:

Ingredients	Actual Qty.(Kg)	Cost per Kg.(₹)	Total Cost of "B"(₹)
B1	2,202	2.8	6,165.60
B2	2,502	7	17,514
B3	921	2	1,842
	5,625		25,521.60

At every month end, the production manager receives a statement from the Managing Partner. This statement contains material price and usage variances for the month and no other feedback on the efficiency of the processes is provided.

Required
Evaluate the performance measurement system in AF.

Solution

The statement reported, ₹2,062 adverse material price variance. The responsibility for controlling the materials price variance is usually the purchasing manager's. Undoubtedly, in current scenario, the price of materials is largely beyond his or her control; however, the price variance can be influenced by such factors as quality, quantity discounts, distance of supplier's location, and so on. These factors are often under the control of the purchase manager. The production manager is responsible for material usage and cannot be held responsible for the material price variance.

Since total usage variance reported, ₹1,406 favourable, production manager could assume good performance. However, if usage variance is considered in more detail, through the mix and yield calculations, it can be observed that variance was driven by a change in the mix and by using a mix of ingredients which was different from standard, it has resulted in a saving of ₹840; Similarly, it has led to a favourable yield. It is worthwhile to note that changing the mix could impact the product quality and sales as well, however, no information has been given about this.

Prices and quality of three agriculture ingredients are changing significantly every year. Using ex ante prices and usage standards can implicit an outdated view of variances. Failing to separate variances caused by uncontrollable factors and planning errors from variances caused by controllable factors can be demoralizing for the managers.

In addition, managers are not involved in setting the standard mix and the same has not been changed for six years despite continuous changes in the quality and prices of the ingredients. This can also mislead the managers i.e., to carryout control activities which are based on the outdated standards.

Furthermore, a true image is missing in relation to managers' performance as statement does not include any feedback or comments on the variances. Even no follow up is being taken on the same.
Overall, it appears that AF is not having comprehensive performance measurement system, and this could adversely impact the firm in long run.

Workings

Price Variance

Input	Actual Qty. (Kg)	Std. Cost (₹)	Actual Cost (₹)	Difference (₹)	Variance (₹)
B1	2,202	3	2.8	0.20	440 (F)
B2	2,502	6	7	1 (A)	2,502 (A)
B3	921	2	2	-	-
	5,625				2,062 (A)

Usage Variance

Input	Standard Qty. (Kg)	Actual Qty. (Kg)	Difference (Kg)	Std. Cost (₹)	Variance (₹)
B1	1,934	2,202	268 (A)	3	804 (A)
B2	2,855	2,502	353 (F)	6	2,118 (F)
B3	967	921	46 (F)	2	92 (F)
	5,756	5,625	131 (F)		1,406 (F)

Mix Variance

Input	Rev. Actual Qty. (Kg)	Actual Qty. (Kg)	Difference (Kg)	Std. Cost (₹)	Variance (₹)
B1	1,890	2,202	312 (A)	3	936 (A)
B2	2,790	2,502	288 (F)	6	1,728 (F)
B3	945	921	24 (F)	2	48 (F)
	5,625	5,625	NIL		840 (F)

Yield Variance

Input	Standard Qty. (Kg)	Rev. Actual Qty. (Kg)	Difference (Kg)	Std. Cost (₹)	Variance (₹)
B1	1,934	1,890	44 (F)	3	132 (F)
B2	2,855	2,790	65 (F)	6	390 (F)
B3	967	945	22 (F)	2	44 (F)
	5,756	5,625	131 (F)		566 (F)

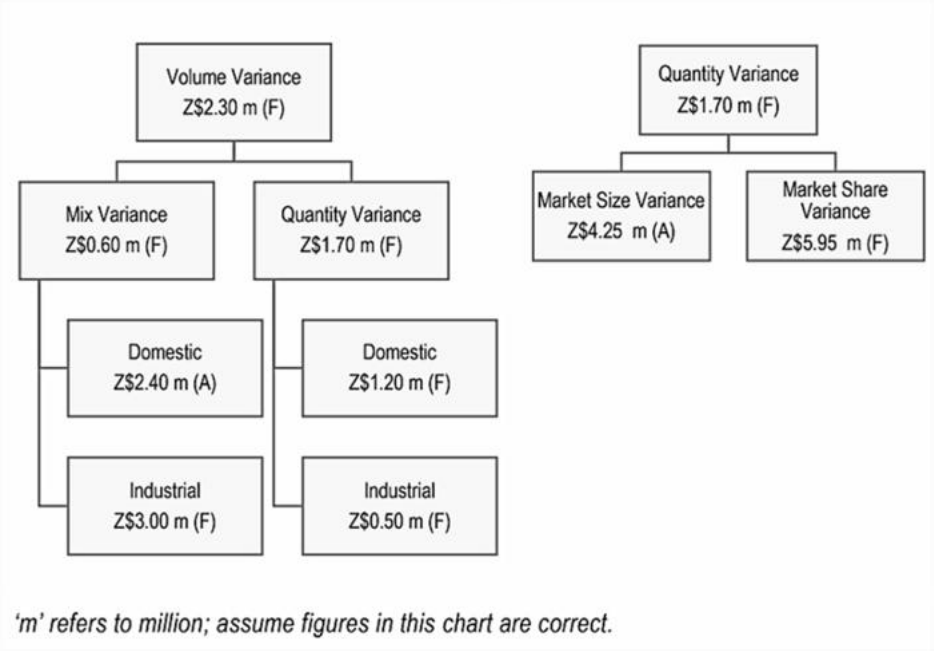
Question 12

ZM Inc. is a family run business based in Country Z. It is a manufacturer of two types of flooring rolls, one for industrial usage and the other for domestic residential use, throughout mainland of Country Z. The company started with the production of residential domestic flooring. It is now an established player in this market. In the recent years, the company pioneered into making flooring rolls for industrial usage. The management has the following information about the budgeted and actual data for 2024-

Particulars	Static Budget			Actual Result		
	Industrial	Domestic	Total	Industrial	Domestic	Total
Unit Sales in Rolls ('000)	200	600	800	270	570	840
Contribution Margin (Z$ in millions)	10.00	24.00	34.00	12.825	15.390	28.215

In late 2023, marketing research estimated market volume for industrial and domestic flooring at 8 m Rolls. Actual market volume for 2024 was 7 m Rolls. Actual sales trend of ZM Inc. is indicative of the sales trends for individual products in the future years, it is likely that they might continue to sell a similar sales trajectory.

A newly appointed accountant has computed following variances from the above data:



'm' refers to million; assume figures in this chart are correct.

Required

Assuming yourself as a performance management expert of ZM, the CEO has asked you to:

(i) Analyse the variances computed by the accountant;

(ii) Advise strategic inputs on 'two types of flooring rolls' to help out her in strategic decision making

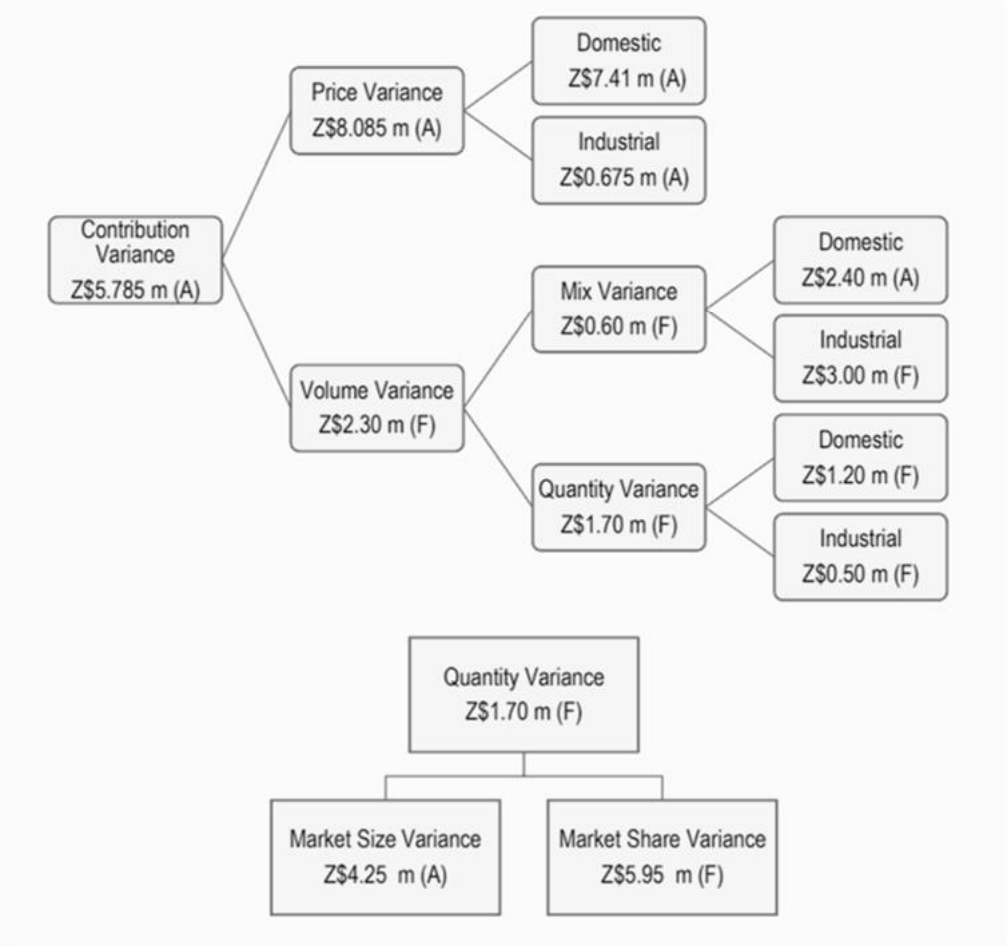
Solution

i. Analysis of Variances

It can be seen that total unit sales increased by 40,000 rolls resulted in a favorable volume variance. Therefore, a potential increase of Z$2.3 m in contribution margin was achieved as a result of the change in sales volume compared with budgeted volume. The volume variance is further divided into a mix and quantity variance. In the case of ZM, mix variance came out to be Z$0.60 m favorable and the quantity variance came out to be favorable Z$1.70 m. Favorable mix variance Z$0.60 m indicates that the sales mix shifts toward the industrial flooring rolls i.e. high contribution product. ZM sold 40,000 more rolls than were budgeted, resulting in Z$1.70 m favorable quantity variance.

Therefore, it is necessary to identify the reasons behind the increase in sales. The reasons may be the competitor's distribution issues, better customer services, or growth in the overall market. Further insight into reasons for quantity variance can be gained by analyzing market share and size variances. ZM gained 2 market share percentage points from 10% budgeted share to the actual share of 12%. The Z$5.95 m favorable market share variance may be the effect of the decline in contribution margin rate. The impact of changing market size on contribution margin can be traced through market size variance. Market size variance is Z$4.25 m adverse as actual market size decreased 12.5% compared

to budgeted market size. Further, it appears that the accountant has failed to compute the price variance, which is a substantial part of the analysis. If we look closely at the data given, the price variance for domestic as well as industrial roll can be computed without difficulty. The price variance for domestic flooring rolls as well as industrial flooring rolls is unfavorable; this indicates that both varieties were sold at a lower margin than standard. This throughout analysis shows a negative impact of Z$ 5.785 m on contribution margin for which price variance is the main contributor. Revised structures after the computation of price variance are as under:



Workings

Contribution Price Variance

Product	Actual Qty. (units'000)	Actual Contribution per unit (Z$)	Standard Contribution per unit (Z$)	Difference (Z$)	Variance (Z$)
Domestic	570	27.00	40.00	-13.00	7.41 m (A)
Industrial	270	47.50	50.00	-2.50	0.675 m (A)
Total	840				8.085 m (A)

Strategic Inputs

The actual sale of industrial flooring rolls is 35% higher than projections. However, the actual contribution margin of Z$47.5 is marginally lower than standard contribution margin of Z$50 per unit. This indicates that ZM may have cut its selling price to maintain or gain market share. Therefore,

industrial flooring rolls are in the Growth Phase of product life cycle. Due to the increase in demand, there is a possibility of higher sales and profits to be made in future years.

Similarly, the actual sale of domestic flooring rolls is 5% lower than the expectations. However, the actual contribution margin is Z$27 per roll i.e. 32.5% lower than the standard contribution margin. This indicates that ZM may have sold these at substantially reduced prices to maintain the sales volume. Therefore, the domestic residential flooring rolls might be in the Decline Stage of product life cycle.

The market size for flooring rolls has reduced from an expectation of 80 lacs rolls to 70 lacs rolls. Therefore, the market size has shrunk significantly by 12.5% for the year 2024. This is a threat to the profitability of the business. The management has to understand the reasons behind this shrinkage. For example, dwindling demand may be on account of cheaper substitutes available for flooring rolls. The management has to take cognizance of this threat to business. A positive for ZM is that its actual market share for flooring rolls was higher than expected at 12%. An increase in market share would have a beneficial impact on the company's profitability. Also, despite the shrinkage in market size, demand for industrial flooring rolls seems to be on the rise. This could be an opportunity for the management to consider.

As explained above, the industrial flooring rolls seem to be in the Growth Stage of product life cycle, while the domestic residential rolls are in the Decline Stage. Industrial flooring rolls have a higher contribution margin per roll as compared to domestic residential rolls. Accordingly, ZM may consider phasing out domestic flooring rolls and concentrate on industrial flooring rolls. In view of shrinking market conditions, it would be more profitable to phase out the weaker product and concentrate on the fast-moving and profitable product. At the same time, since domestic flooring roll still has significant demand, the strategy to phase out this product may have to be done in a phased and well-planned manner. In view of the shrinking market size, ZM should not end up losing its market share due to phasing out domestic flooring rolls.

For Your Conceptual Understanding
"Budgeted Vs Actual Figures"

Product	Budgeted Qty. Rolls ('000)	Standard Cont. per Roll (Z$)	Budgeted Cont. (Z$' in millions)	Actual Qty. Rolls ('000)	Actual Cont. per Roll (Z$)	Actual Cont. (Z$ 'in millions)	Revised Actual Qty. ('000)
Dom.	600	40	24.00	570	27	15.390	630 (840×75%)
Ind.	200	50	10.00	270	47.5	12.825	210 (840×25%)
	800		34.00	840		28.215	840

Contribution Mix Variance

Product	Standard Contribution per unit (Z$)	Actual Qty. (units'000)	Revised Actual Quantity (units'000)	Difference ('000)	Variance (Z$)
Domestic	40	570	630	-60	2.40 m (A)
Industrial	50	270	210	+60	3.00 m (F)
Total		840			0.60 m (F)

Contribution Quantity Variance

Product	Standard Contribution per unit (Z$)	Revised Actual Quantity (units'000)	Budgeted Quantity (units'000)	Difference ('000)	Variance (Z$)
Domestic	40	630	600	+30	1.20 m (F)
Industrial	50	210	200	+10	0.50 m (F)
Total		840			1.70 m (F)

Market Size Variance

= Budgeted Market Share % × (Actual Industry Sales Quantity in units – Budgeted Industry Sales Quantity in units) × (Average Budgeted Contribution per unit)

= 10% × (70,00,000 Rolls – 80,00,000 Rolls) × Z$ 42.50

= Z$ 4.25 m (A)

Market Share Variance

= (Actual Market Share % – Budgeted Market Share %) × (Actual Industry Sales Quantity in units) × (Average Budgeted Contribution per unit)

= (12% – 10 %) × 70,00,000 Rolls × Z$ 42.50

= Z$ 5.95 m (F)