

STANDARD COSTING AND VARIANCE ANALYSIS

Exercise 01

At the beginning of the year 2019, WB Ltd set a standard marginal cost for its major product of Rs.25 per unit. The standard cost is recalculated once each year. Actual production costs during August 2019 were Rs304,000, when 8,000 units were made.

With the benefit of the hindsight, the management of WB Ltd realizes that a more realistic standard cost for current condition would be Rs.40 per unit. The planned standard cost of Rs.25 per unit is unrealistically low.

Required

Calculate the planning and operation variances.

Exercise 02

Suppose a budget is prepared which includes a raw material cost per unit of product of Rs.200 (2Kg of copper at Rs100 per Kg). Due to a rise in world prices for copper during the year, the average market price of copper rises to Rs.150 per Kg. During the year, 1,000 units were produced at a cost of Rs.325,000 for 2,200Kg of copper.

What is the planning and operational variance?

Exercise 03

A new product requires three hours of labour per unit at a standard rate of Rs600 per hour. In a particular month the budget is to produce 500 units. Actual results were as follows;

Hours worked	1,700
Production	540 Units
Wages cost	Rs. 1,050,000

Within minutes of production starting it was realized that the job was extremely messy and the labour force could therefore claim an extra Rs25 per hour in “dirty money”.

You are required to calculate

Planning and operation variances in as detail as possible.

Exercise 04

A company estimates that the standard direct labour cost for a product should be Rs.2,000 (4 hours X Rs.500 per hour). Actual production of 1,000 units took 6,200 hours at a cost of Rs.2,380,000. In retrospect, it is realized that standard cost should have been 6 hours X Rs.400 per hour = Rs.2,400 per unit.

You are required to calculate

Planning and operation variances in as detail as possible.

Exercise 05

The standard material cost of a product is 3Kg X Rs150 per Kg = Rs.450. Actual production of 10,000 units used 28,000 Kg at a cost of Rs.50,000. In retrospect it was realized that standard material cost should have been 2.5Kg per unit at a cost of Rs.180 per Kg (so that the total cost per unit was correct).

You are required to calculate

Planning and operation variances in as detail as possible, giving alternative analysis of planning variance.

Exercise 06

Dimsek Ltd budgeted to make and sell 400 units of its products, the role, in the four week period no.8, as follows;

	Rs.
Budgeted sales (100 units per week)	40,000
Variable cost (400 units X Rs60)	<u>24,000</u>
Contribution	16,000
Fixed cost	<u>10,000</u>
Profit	<u>6,000</u>

At the beginning of the second week, production came to halt because stocks of raw materials ran out, and a new supply was not received until the beginning of the week 3. As a consequences, the company lost one week's production and sales. Actual result in period 8 were as follows;

	Rs.
Sales (320 units)	32,000
Variable cost (320 Units X Rs.60)	19,200
Contribution	12,800
Fixed cost	10,000
Actual profit	2,800

In retrospect, it is decided that the optimum budget, given the lost of production facilities in the third week, would have been to sell only 300 units in the period.

Required

To calculate appropriate planning and operation variances.

Exercise 07

KSO limited budgeted to sell 10,000 units of a new product during 2019. The budgeted sales price was Rs.10 per unit and the variable cost Rs.3 per unit.

Although actual sales in 2019 were 10,000 units and the variable cost of sales were Rs30,000, the sales revenue was only Rs.5 per unit. With the benefit of hindsight, it is realized that the budgeted sales price of Rs.10 was hopelessly optimistic, and price of Rs.4.50 per unit would have been much more realistic.

Required

To calculate appropriate planning and operation variances.

Exercise 08

Brain Ltd produces and sells one product only. The Blob, the standard cost for one unit being as follows;

	Rs.
Direct material A – 10Kg at Rs200/- per Kg	2,000
Direct material B – 5L at Rs600/- per Liter	3,000
Direct wages – 5Hrs at Rs600 per hour	3,000
Fixed production overhead	<u>5,000</u>
Total standard cost	<u>13,000</u>

The fixed overhead included in the standard cost is based on an expected monthly output of 900 units. The fixed production overhead is absorbed on the basis of direct labour hours.

During the April the actual results were as follows;

Production	800Units
Material A – 7,800Kg used costing	Rs1,599,000
Material B – 4,300L used costing	Rs2,365,000
Direct wages – 4,200 hours worked for	Rs2,415,000
Fixed production overhead	Rs4,700,000

You are required to calculate;

- Direct material cost, price and usage variance of each material
- Labour cost, rate and efficiency variance
- Fixed OH cost, expenditure, volume, volume capacity and volume efficiency variance.

Exercise 09

The standard direct material cost of Product X is Rs96 (16Kgs * Rs6 per Kg) and the standard direct labour cost is Rs72 (6hours * Rs12 per hour). The following variances were among those reported in control period 10 in relation to product X.

Direct material price : 18,840 F Direct labour rate : Rs10,598 A
Direct material usage : Rs480 A Direct labour efficiency Rs:8,478 F

Actual direct wages cost Rs171,320 and Rs5.50 was paid for each Kg of direct material. There was no opening or closing stock of the material.

You are required to calculate

- Actual output
- Actual hours worked
- Average actual wage rate per hour
- Actual no. of Kilograms purchased and used

Exercise 10

XYZ Ltd uses standard costing. The following data relates to labor grade 2.

Actual hours worked = 10,400 hours Standard Rate per Hour = Rs5
Standard allowance for actual production = 9,800 hours Rate Variance = Rs416 A

What was the actual rate of pay per hour?

Exercise 11

A company manufactures a chemical, Dynamite, using two compounds Flash and Bang. The standard material usage and the cost of one unit of Dynamite are as follows;

	Rs.
Flash 5Kg at Rs200.00 per Kg	1,000
Bang 10Kg at Rs300.00 per Kg	<u>3,000</u>
	<u>4,000</u>

In a particular period, 80 units of dynamite were produced from 500Kg of Flash and 730Kg of Bang.

Required

Calculate material usage, mix and yield variances.

Exercise 12

The standard material cost of product D456 is as follows;

	Rs.
Material X 3Kg at Rs200.00 per Kg	600
Material Y 5Kg at Rs360.00 per Kg	<u>1,800</u>
	<u>2,400</u>

During the period 2, 2,000 Kg of material X (costing Rs.410,000) and 2,400Kg of material Y (costing Rs960,000) were used to produce 500 units of D456.

Required

Calculate material price, mix and yield variances.

Exercise 13

Coop Ltd makes product T42 in a continuance process, for which standard and actual quantities in month 10 were as follows;

Material	Quantity Kgs	Std. Price per Kg Rs.	Value Rs.	Quantity Kgs	Act. Price per Kg Rs.	Std. cost of actual usage Rs.
P	40,000.00	2.50	100,000.00	34,000.00	2.50	85,000.00
Q	20,000.00	4.00	80,000.00	22,000.00	4.00	88,000.00
	60,000.00		180,000.00	56,000.00		173,000.00

Losses occur at an even rate during the processing operation and are expected to be 10% of the material input. Actual output during the month was 53,000Kgs.

Required

Calculate material usage, mix and yield variances.

Exercise 14

Given below the standard direct labour cost of product Z of Rose Ltd.

Skilled labour – 6hours at Rs60/- per hour = Rs360/-

Unskilled labour – 4hours at Rs50/- per hour = Rs200/-

Actual information for the last month is given below.

Production – 100 Units

Skilled labour – 500hours at Rs65/- per hour

Unskilled labour – 550hours at Rs45/- per hour

Required to calculate;

- Direct labour total cost variance
- Direct labour rate variance
- Direct labour efficiency
- Direct labour mix variance
- Direct labour productivity variance

Exercise 15

Tardis Ltd manufactures three products, the Dalek, the Yeti, and the Cyberman. The budget relating to period 01 is given below.

Product	Units sales price Rs.	Unit full cost Rs.	Budgeted sales unit	Standard mix
Dalek	5.00	3.00	500.00	50%
Yeti	7.00	4.00	300.00	30%
Cyberman	10.00	6.00	200.00	20%

Actual sales in period 1 were as follows;

Product	Sales unit	Standard mix
Dalek	700.00	46.70%
Yeti	300.00	20.00%
Cyberman	500.00	33.30%

1,500.00

Required

Calculate sales margin, mix and quantity and volume variances.

Exercise 16

Ravan Ltd produces and sells product X and Y. You are given the following information for the last month.

Product	Budgeted / Standard			Actual		
	Units	Unit Selling Price Rs.	Unit Cost	Units	Unit Selling Price Rs.	Unit Cost
X	1,000	100	80	1,050	98	82
Y	1,500	110	95	1,400	111	96
Total	2,500			2,450		

Required to calculate

- Sales margin variance
- Sales margin price variance
- Sales margin volume variance
- Sales margin mix variance
- Sales margin qty variance

Exercise 17

Rex Ltd budgets to produce 1,000 units of product E during August. The expected time to produce a unit of E is five hours, and the budgeted fixed production overhead is Rs.20,000. The standard fixed production overhead cost per unit of product E will therefore be 5 hours at Rs.4 per hours (= Rs20 per unit). Actual fixed production overhead expenditure in August turns out to be Rs20,450. The labor force manages to produce 1,100 units of product E in 5,400 hours of work.

Required to calculate

- The fixed production overhead total variance.
- The fixed production overhead expenditure variance.
- The fixed production overhead volume variance.
- The fixed production overhead capacity variance.
- The fixed production overhead efficiency variance.

Exercise 18

Think PLC, manufactures product R and the entire product is sold as soon as it is produced. There are no opening and closing inventories and work in progress is negligible. The company operates standard costing system and the analysis of variance is made every month. The standard cost card for the product is as follows;

	Rs.
Direct material 2Kg at Rs8/- per Kg	16
Direct labour 0.5 hours at Rs50 per hour	25
Variable overhead 0.5 hours at Rs30/- per hour	15
Fixed overhead 0.5 hours at Rs40 per hour	<u>20</u>
Standard cost	76
Standard profit	<u>14</u>
Standard selling price	<u>90</u>

Budgeted output for the month of June 2015 was 51,000 units.

Actual result for June 2015 were as follows;

Production of 48,500 units was sold for Rs.4,462,000

Material consumed in production amounted to 92,150kg at a total cost of Rs829,350.

Labour hours paid for amounted to Rs19,400 hours at a cost of Rs. 989,400.

Actual operating hours were 19,000 hours

Variable overhead amounted to Rs532,000.

Fixed overhead amounted to Rs855,000.

You are required to

- Calculate the variance
- Prepare operating statement for the month.

Exercise 19

JKG PLC makes a single product P2 and uses marginal costing. It uses a Just-In-Time system and holds no inventories. The standard cost card for one unit is as follows;

Standard cost card

	Rs.
Direct material 4Kg at Rs30/- per Kg	120
Direct labour 2 hours at Rs100 per hour	200
Variable overhead 2 hours at Rs20/- per hour	<u>40</u>
Standard variable cost	360
Standard contribution	<u>440</u>
Standard selling price	<u>800</u>

The budgeted production and sales for the month of May 2019 is 1,000 units and you are given the following actual information for the month of May 2019.

	Rs.
	<u>960 units</u>
Sales revenue	777,600
Direct material cost	(120,450)
Direct labour cost	(175,200)
Variable overhead	<u>(43,800)</u>
Contribution	<u>438,150</u>

The company used 3,650Kg of material during the month of May 2015 and the labour force worked and was paid for 1,825 hours.

Budgeted and actual fixed overhead for the month was Rs150,000 and Rs140,000 respectively.

You are required to

- Compute all the sub variances for the month of May 2019
- Prepare an operating statement incorporating all the sub variances for the month of May 2019.

Exercise 20

Data has been collected and analyzed and reveals that transport cost per month are Rs25,000, with a standard deviation of Rs2,000. A 0.01 significance rule is in use. Actual travel expenses are Rs28,750. Should the resulting variance be investigated?

Exercise 21

Standard cost of the product RBT is as follows;

Standard cost per unit	Rs.	Actual Result	
Material (10Kg * Rs.8 per Kg)	80.00	Production	8,000 Units
Labour (5Hrs * Rs.6 per hour)	30.00	Sales	6,000 Units
Variable OH (5Hrs * Rs.8 per hour)	40.00	Material	85,000Kg cost Rs700,000
Fixed OH (5Hrs * Rs.9 per hour)	45.00	Labour	36,000 Hrs cost Rs330,900
	195.00	Variable OH	Rs.400,000
		Fixed OH	Rs.500,000
		Selling Price	Rs.260 per unit

Budgeted Result

Production	10,000 Units
Sales	7,500 Units
Selling price	Rs.300 per unit

You are required to

- Calculate the budgeted profit and actual profit by using the above information.
- Calculate the necessary variances and prepare an operating statement incorporating all the sub variances.

Question 01

Sewing Co (Pvt) Ltd (SC) manufactures garments and has undertaken a long-term contract to manufacture specially designed shirts for an overseas customer. SC operates the standard costing system for variance analysis and performance evaluation.

During the month of May 2018 the overseas customer has instructed SC to change the design of the shirt. Consequently each shirt now requires 2.64 meters of fabric, which is 10% more than the standard amount of the earlier design. The standard has not been updated with the change in the design. The standard price per meter of fabric is Rs. 600. This has not been updated for two years and should ideally be set at Rs. 650 based on the market prices that prevailed at the time of budgeting. During the month of May, the total quantity of this fabric purchased and used was 159,600 meters valued at Rs. 105.336 million.

SC utilizes both skilled and unskilled labour in making the shirts and there were no changes required for the standard labour time set per unit of a shirt consequent to the above change in fabric. The standard time required to complete a shirt was set as 12 minutes of skilled labour and 8 minutes of unskilled labour.

During the month of May 10,000 hours of skilled labour were actually utilized at Rs. 315 per hour, which is 5% more than the standard labour rate. The actual unskilled labour utilized for the month of May was 13,000 hours at a cost of Rs. 2.47 million with a 5% reduction in the standard rate.

Based on the labour information, SC's finance manager has already prepared the following labour variances.

Variance	Variance amount Rs.	Favorable / Adverse
Skilled labor rate	150,000.00	Adverse
Unskilled labor rate	130,000.00	Favorable
Skilled labor efficiency	600,000.00	Favorable
Unskilled labor efficiency	1,000,000.00	Adverse

SC budgeted to manufacture 65,000 new shirts during the month of May 2018, but could only produce 60,000 shirts.

Required:

(a) **Compute** the following variances:

- (i) Planning variances for material price and usage of fabric
- (ii) Operating variances for material price and usage of fabric (6 marks)

(b) **Demonstrate** how the finance manager has arrived at the labour variances given in his table. (4 marks)

(c) The management wishes to investigate the causes for the adverse labour efficiency variances. **Demonstrate** two (02) instances where the investigation of a variance is Meaningless and not advisable. (4 marks)

(d) **Assess** the impact of the variances in the labour mix and labour yield on the efficiency of labour utilization in the month of May. (8 marks)

(e) **Explain** the causes for the labour efficiency variances based on your findings in (d) above. (3 marks)

Question 02

York Products (Pvt) Ltd (YPP) makes an Ayurvedic soap, in batches, and sells to the local market. The standard cost of labour for each batch is Rs. 600 and the standard labour time for each batch is 3 hours. YPP, for the month of March, had budgeted to produce 10,000 batches. However, it actually produced only 8,000 batches. 26,400 labour hours were used to complete the production, with no idle time. The actual total labour cost for March was Rs. 4,752,000.

Market research indicated that the soap is having less ayurvedic aroma than the competitors' products in the market. Therefore, the production technicians made a slight change in the raw material recipe, effective March. It is expected that this recipe change would utilize 15% more labour time than before, in the first month of operation, and in the second month, the labour time would normalize at 10% slowdown, compared with the current operation.

Further, as an initiative to cut higher labour cost, the managing director at the end of February, announced an offer to staff, the choice of either accepting a 10% pay cut or facing redundancy of a certain number of employments. Subsequently all workers agreed to the 10% pay cut.

Required:

(a) **Calculate** the following variances for YPP for the month of March.

- (i) Labour rate planning variance
- (ii) Labour rate operating variance
- (iii) Labour efficiency planning variance
- (iv) Labour efficiency operating variance (6 marks)

(b) **Assess** the performance of the production manager, for the month of March, based on the results in (a) above. (4 marks)

Question 03

Ten Star Apparel Manufacturers (TSAM) produces hand-made apparels for large export orders. TSAM has entered into a joint venture (JV) with Big Star International (BSI) to supply a uniform product. According to the JV agreement TSAM operates an exclusive production line with three main processes: cutting, stitching and finishing. TSAM also introduced a standard absorption costing system for the exclusive production line as part of the requirements of the JV agreement.

The standard cost per unit of output at the stitching department is given below.

	Rs.
Direct materials:	
Transferred from the cutting department (3 meters at Rs. 180 per meter)	540
Accessories bought from outside (4 pieces at Rs. 100 per piece)	400
Direct labour (14 hours at Rs. 40 per hour)	560
Variable overheads (Rs. 20 per direct labour hour)	280
Fixed production overheads:	
Directly incurred by the stitching department (Note 01)	60
Allocation from the general pool	<u>160</u>
	<u>2,000</u>

During the first month of operations, the actual costs of stitching department were as follows.

	Rs.
Direct materials:	
☐ Transferred from the cutting department (Note 02): 1,400 meters	420,000
☐ Accessories bought from outside: 1,900 pieces	230,000
Direct labour: 6,500 hours	280,000
Variable overheads	160,000
Fixed production overheads:	
☐ Directly incurred by the stitching department	32,000
☐ Allocation from the general pool (Note 03)	<u>58,000</u>
	<u>1,180,000</u>

Note 01 - This is based on the normal monthly production of 400 units.

Note 02 - This is the actual cost of the output of the cutting department during the first month.

Note 03 - Total production overheads are allocated based on labour hours.

Actual production in the stitching department during the first month was 500 units.

There were no inventories at the end of the first month.

The operations manager has stated that the stitching department had been inefficient in controlling costs and as a result the actual unit cost has increased by 18% compared to what it should have been.

Required:

(a) **Prepare** a detailed variance analysis that will enable a critical evaluation of the performance of the stitching department. (15 marks)

(b) **Demonstrate** the extent to which the performance is attributable to and controllable by the stitching department, in the context of the operations manager's comments. (10 marks)

Question 04

Othello Electronic Appliances (OEA) manufactures a range of household appliances which are sold in major retail stores.

Product group PG-10 One of OEA's product groups PG-10 is comprised of three products, product A, B and C. Following information is given in respect of PG-10 for the month of October 2015.

	Product A		Product B		Product C	
	Actual	Budget	Actual	Budget	Actual	Budget
Sales quantity (units)	720	800	3,100	2,600	780	600
Average unit selling price (Rs.)	240	220	31	32	250	280
Direct material cost per unit (Rs.)	110	100	15	16	130	120
Direct labour cost per unit (Rs.)	45	40	6	6	60	60
Variable overhead cost per unit (Rs.)	6	4	0.8	0.6	8	6
Actual direct labour cost per hour was Rs. 1.875 (budget Rs. 2)						
Actual variable overhead cost per direct labour hour was Rs. 0.25						

OEA does not maintain any inventory.

The following is an excerpt from the report on PG-10 submitted by the production manager for the month of October 2015:

“Labour cost of product C, being a major component, has been controlled exceptionally well. Direct labour cost per unit has not changed from the budgeted figure resulting in zero variance.”

Product NP-01

OEA recently introduced a new product NP-01. The standard cost data for NP-01 showed that each unit of the product was expected to take 8 hours to produce at a cost of Rs. 300 per hour. Actual output of the product was 560 units and actual time worked in the manufacture of the product totalled to 3,500 hours at a cost of Rs. 1,155,000.

The following variances have been calculated for NP-01:

Direct labour efficiency variance Rs. 294,000 Favourable
Direct labour rate variance Rs. 105,000 Adverse

However, the production manager now realises that the standard time of 8 hours per unit was the time taken to produce the first unit and that a learning rate of 90% should have been anticipated.

Required:

- (a) **Calculate** the sales mix contribution variance and the sales quantity contribution variance for PG-10 for the month of October 2015. (5 marks)
- (b) **Analyze** the variances calculated in (a) above with a view to provide an insight of the impact of the actual performance on the planned outcome in terms of profitability. (4 marks)
- (c) **Demonstrate** whether you agree with the statement made by the production manager in his report on PG-10. (5 marks)
- (d) **Calculate** planning and operating variances for NP-01 consequent to the recognition of the learning curve effect. (5 marks)
- (e) **Explain** three (03) factors OEA would need to consider before deciding whether to investigate any variance. (6 marks)

Question 05

Communication Networks (Pvt) Limited (CN) manufactures and sells an electronic component used in communication equipment. The company operates a standard marginal costing system and a just-in-time (JIT) purchasing and production system with no inventory of raw materials or finished goods being held. Given below is information pertaining to the budgeted and actual results for the year ended 31 March 2015.

Given below is information pertaining to the budgeted and actual results for the year ended 31 March 2015.

Extracts from the budget for the year ended 31 March 2015

Production and sales	10,000 units	
		Rs.
Standard selling price per unit	1,800	
Standard production costs per unit:		
Direct material; 8 kg at Rs. 108 per kg		864
Direct labour; 1.25 hours at Rs. 180 per hour		225
Variable overheads; 1.25 hours at Rs. 60 per direct labour hour		75
Fixed production overheads		1,700,000

Extracts from the accounting records for the year ended 31 March 2015 (actual information)

Production and sales	9,000 units
Selling price	Rs. 1,840 per unit
Direct material	74,000 kg at Rs. 112 per kg
Direct labour	10,800 hours at Rs. 190 per hour
Variable overheads	Rs. 700,000
Fixed production overheads	Rs. 1,680,000

Required:

- Reconcile** the budgeted profit with the actual profit showing the variances in as much detail as possible using the standard marginal costing approach. (11 marks)
- Explain** why the variances used to reconcile profit in a standard marginal costing system are different from those used in a standard absorption costing system. (4 marks)
- Calculate** the variances that would be different and any additional variances that would be required if the reconciliation statement was prepared using standard absorption costing. (Preparation of a revised statement is not required.) (4 marks)
- Discuss** the arguments in favour of the use of traditional absorption costing rather than marginal costing for profit reporting and inventory valuation. (6 marks)

Question 06

Zenith Ltd. produces animal food packs of 5 kg each that are sold in Super Markets. It operates a standard costing method considering its' advantages to the company. Standard cost details for a 5 kg pack is as follows:

Direct material A 4 Kg @ Rs.20/-
Direct material B 2 Kg @ Rs.55/-

From the month of January 2015, it was decided to revise the standard price of material B as Rs.50/- per Kg considering changes to the tariff system prevailing in the country. Actual data for the month of January is as follows:

Direct material A 15,100 Kg @ Rs.21/-
Direct material B 07,700 Kg @ Rs.48/-

Direct material usage variance is Rs.6,600/- (Adverse).

You are required to:

- (a) (i) State three(03) advantages of standard costing. (03 marks)
(ii) State three(03) limitations of standard costing. (03 marks)
- (b) Compute direct material price variance. (02 marks)
- (c) Compute direct material cost variance using direct material usage and direct material price variances. (02 marks)
- (d) Compute the following:
 - (i) Total standard direct material cost. (02 marks)
 - (ii) Actual number of packs produced. (02 marks)
- (e) Compute the following variances:
 - (i) Direct material mix (04 marks)
 - (ii) Direct material yield (04 marks)
 - (iii) Direct material planning (03 marks)

