Chapter 18

STANDARD COSTING: SETTING
STANDARDS AND ANALYZING VARIANCES

MULTIPLE CHOICE

Question Nos. 11-16, 18, 19, 21, 22, 26-28, 31, 35, and 36 are AICPA adapted.
Question Nos. 23-25 and 30 are ICMA adapted.
Question Nos. 17, 20, 29, 32-34, and 37 are CIA adapted.

D   **1.**   **The type of standard that is intended to represent challenging yet attainable results is:**
     A.   theoretical standard
     B.   flexible budget standard
     C.   controllable cost standard
     D.   normal standard
     E.   expected actual standard

A   **2.**   **Standard costs are used for all of the following *except:***
     A.   income determination
     B.   controlling costs
     C.   measuring efficiencies
     D.   forming a basis for price setting
     E.   establishing budgets

C   **3.**   **Of the following variances, the one that is most useful in assessing the performance of the Purchasing Department is the:**
     A.   idle capacity variance
     B.   overhead price variance
     C.   materials purchase price variance
     D.   labor rate variance
     E.   materials price usage variance

B   **4.**   **The labor efficiency variance is computed as:**
     A.   the difference between standard and actual rates, multiplied by standard hours
     B.   the difference between standard and actual hours, multiplied by standard rate
     C.   the difference between standard and actual rates, multiplied by actual hours
     D.   the difference between standard and actual hours, multiplied by the difference between standard and actual rates
     E.   a percentage of the labor time variance

B   5.   The method used to assure fairness in the rates paid for each operation performed by an employee is:
      A.   job costing
      B.   job rating
      C.   union contracting
      D.   the agreed-upon wages at the time of employment
      E.   labor rate variance analysis

D   6.   Materials and labor cost standards are generally based on:
      A.   expected actual conditions, anticipated prices, and desired efficiency levels
      B.   theoretical conditions, present price levels, and desired efficiency levels
      C.   capacity conditions, anticipated prices, and desired efficiency levels
      D.   normal conditions, present price levels, and desired efficiency levels
      E.   theoretical conditions, anticipated prices, and theoretically attainable efficiency levels

D   7.   The most effective standards are set following a careful study of products and operating conditions by the:
      A.   Accounting Department, central management, and the Industrial Engineering Department
      B.   central management and the employees whose performance is being evaluated
      C.   Accounting Department and engineering staff
      D.   Industrial Engineering Department and the employees whose performance is being evaluated
      E.   central management and the Industrial Engineering Department

E   8.   In analyzing factory overhead variances, the volume variance is the difference between the:
      A.   actual amount spent for overhead items during the period and the amount applied during the period
      B.   variable efficiency variance and fixed efficiency variance
      C.   amount shown in the flexible budget and the amount shown in the master budget
      D.   master budget application rate and the flexible budget application rate, multiplied by actual hours worked
      E.   budget allowance based on standard hours allowed for actual production for the period and the amount of applied factory overhead during the period

D   9.   The variance resulting from obtaining an output different from the one expected on the basis of input is the:
      A.   mix variance
      B.   output variance
      C.   usage variance
      D.   yield variance
      E.   efficiency variance

A   10.   In its reports to management, a company disclosed the presence of a fixed efficiency variance. The procedure used to analyze variances was the:
      A.   four-variance method
      B.   mix and yield variances method
      C.   two-variance method
      D.   alternative three-variance method
      E.   three-variance method

D   11.   A purpose of standard costing is to:
        A.   allocate cost with more accuracy
        B.   eliminate the need for subjective decisions by management
        C.   determine the "break-even" production level
        D.   control costs
        E.   all of the above

A   12.   Which one of the following is true concerning standard costs?
        A.   If properly used, standards can help motivate employees.
        B.   Unfavorable variances, material in amount, should be investigated, but large favorable variances need not be investigated.
        C.   Standard costs are difficult to use with a process costing system.
        D.   Standard costs are estimates of costs attainable only under the most ideal conditions, but rarely practicable.
        E.   All of the above

A   13.   When computing variances from standard costs, the difference between actual and standard price multiplied by actual quantity yields a:
        A.   price variance
        B.   volume variance
        C.   mix variance
        D.   yield variance
        E.   combined price-quantity variance

E   14.   A company controls its production costs by comparing its actual monthly production costs with the expected levels.   Any significant deviations from expected levels are investigated and evaluated as a basis for corrective actions.   The quantitative technique that is most probably being used is:
        A.   time-series or trend regression analysis
        B.   correlation analysis
        C.   differential calculus
        D.   risk analysis
        E.   standard cost variance analysis

C   15.   What type of direct material variances for price and usage will arise if the actual number of pounds of materials used was less than standard pounds allowed but actual cost exceeds standard cost?

	Usage	**Price**
A.	**unfavorable**	**favorable**
B.	**favorable**	**favorable**
C.	**favorable**	**unfavorable**
D.	**unfavorable**	**unfavorable**
E.	**none**	**none**

B   16.   If a company follows a practice of isolating variances at the earliest time, the appropriate time to isolate and recognize a direct materials price variance would be when:
        A.   the purchase order is originated
        B.   materials are purchased
        C.   materials are issued
        D.   the materials requisition is prepared
        E.   materials are used in production

A   17.   Which of the following would least likely cause an unfavorable materials quantity (usage) variance?

A.   labor that possesses skills equal to those required by the standards
B.   scheduling of substantial overtime
C.   a mix of direct materials that does not conform to plan
D.   materials that do not meet specifications
E.   machinery that has not been maintained properly

D   18.   Information about Sargent Company's direct material costs is as follows:

Standard unit price	$3.60
Actual quantity purchased	1,600
Standard quantity allowed for actual production	1,450
Materials purchase price variance—unfavorable	$240

What was the actual purchase price per unit, rounded to the nearest penny?
A. $3.06
B. $3.11
C. $3.45
D. $3.75
E. $3.60

SUPPORTING CALCULATION:

$$\$240 = 1{,}600\,(x - \$3.60)$$
$$1{,}600\,x = \$240 + \$5{,}760$$
$$x = \$3.75$$

C   19.   Using the following symbols, which formula represents the calculation of the labor rate variance?

AH = Actual hours
SH = Standard hours allowed for actual production
AR = Actual rate
SR = Standard rate

A.   SR(AH - SH)
B.   AR(AH - SH)
C.   AH(AR - SR)
D.   SH(AR - SR)
E.   SH(SR - AR)

D   20.   When a change in the manufacturing process reduces the number of direct labor hours and standards are unchanged, the resulting variance will be:

A.   an unfavorable labor usage variance
B.   an unfavorable labor rate variance
C.   a favorable labor rate variance
D.   a favorable labor usage variance
E.   both (C) and (D) above

B   21.   The most probable reason a company would experience a favorable labor rate variance and an unfavorable labor efficiency variance is that:

    A.   the mix of workers assigned to the particular job was heavily weighted toward the use of higher paid, experienced individuals

    B.   the mix of workers assigned to the particular job was heavily weighted toward the use of new, relatively low-paid, unskilled workers

    C.   because of the production schedule, workers from other production areas were assigned to assist in this particular process

    D.   defective materials caused more labor to be used in order to produce a standard unit

    E.   the actual price paid for materials that went into production was less than the standard price that was expected to be paid

C   22.   Information on Orman Company's direct labor costs is as follows:

Standard direct labor rate	**$3.75**
Actual direct labor rate	**$3.50**
Standard direct labor hours	**10,000**
Direct labor usage (efficiency) variance—unfavorable	**$ 4,200**

What were the actual hours worked, rounded to the nearest hour?

    A.   11,914
    B.   10,714
    C.   11,120
    D.   11,200
    E.   none of the above

    SUPPORTING CALCULATION:

$$\$4,200 = \$3.75\,(x - 10,000)$$
$$\$3.75\,x = \$4,200 + \$37,500$$
$$x = 11,120$$

D   23.   Each unit of Product 8in1 requires two direct labor hours. Employee benefit costs are treated as direct labor costs. Data on direct labor are as follows:

Number of direct employees	**25**
Weekly productive hours per employee	**30**
Estimated weekly wages per employee	**$240**
Employee benefits (related to weekly wages)	**25%**

The standard direct labor cost per unit of Product 8in1 is:

    A. $8.00
    B. $10.00
    C. $12.00
    D. $20.00
    E.   none of the above

    SUPPORTING CALCULATION:

$$\frac{\$240 + .25(240)}{30 \div 2} = \$20 \,/\, \text{unit}$$

B   24.   J. R. Richard Company employs a standard absorption system for product costing.   The standard cost of its product is as follows:

Direct materials	**$14.50**
Direct labor (2 direct labor hours x $8)	**16.00**
Manufacturing overhead (2 direct labor hours x $11)	**22.00**
Total standard cost	**$52.50**

The manufacturing overhead rate is based upon a normal activity level of 600,000 direct labor hours.   Richard planned to produce 25,000 units each month during the year.   The budgeted annual manufacturing overhead is:

Variable	**$3,600,000**
Fixed	**3,000,000**
....	**$6,600,000**

During November, Richard produced 26,000 units.   Richard used 53,500 direct labor hours in November at a cost of $433,350.   Actual manufacturing overhead for the month was $250,000 fixed and $325,000 variable.

The manufacturing overhead controllable variance for November is:
A. $9,000 unfavorable
B. $13,000 unfavorable
C. $9,000 favorable
D. $4,000 favorable
E.   none of the above

SUPPORTING CALCULATION:

Actual factory overhead		$ 575,000
Budget allowance:		
Variable factory overhead (52,000 x $6)	$312,000	
Budgeted fixed overhead	250,000	562,000
Controllable variance		$ 13,000 unfavorable

B   25.   **J. R. Richard Company employs a standard absorption system for product costing.   The standard cost of its product is as follows:**

Direct materials	$14.50
Direct labor (2 direct labor hours x $8)...	16.00
Manufacturing overhead (2 direct labor hours x $11)...	22.00
Total standard cost..	$52.50

The manufacturing overhead rate is based upon a normal activity level of 600,000 direct labor hours.   Richard planned to produce 25,000 units each month during the year.   The budgeted annual manufacturing overhead is:

Variable	$3,600,000
Fixed	3,000,000
	$6,600,000

During November, Richard produced 26,000 units.   Richard used 53,500 direct labor hours in November at a cost of $433,350.   Actual manufacturing overhead for the month was $250,000 fixed and $325,000 variable.

The manufacturing overhead volume variance for November is:
A. $12,000 unfavorable
B. $10,000 unfavorable
C. $3,000 unfavorable
D. $9,000 unfavorable
E. $1,000 favorable

SUPPORTING CALCULATION:

Budget allowance based on standard hours allowed		
[(52,000 x $6) + $250,000]...	$	562,000
Factory overhead applied at standard		572,000
Volume variance...	$	(10,000) favorable

C   26.   **The following information relates to Department 1 of Ruiz Company for the fourth quarter.   The total overhead variance is divided into three variances: spending, variable efficiency, and volume.**

Actual total overhead (fixed plus variable).......................................	$178,500
Budget formula...	$110,000 + $.50 per hour
Total overhead application rate	$1.50 per hour
Actual hours worked..	121,000

What was the spending variance in this department during the quarter?
A. $8,000 favorable
B. $4,500 favorable
C. $8,000 unfavorable
D. $4,500 unfavorable
E.   none of the above

SUPPORTING CALCULATION:

Actual factory overhead		$ 178,500
Budget allowance:		
Variable for actual hours		
(121,000 x $.50)..	$ 60,500	
Fixed	110,000	170,500
Spending variance..	$ 8,000 unfavorable

A   27.   **The following information relates to Department 1 of Ruiz Company for the fourth quarter.   The total overhead variance is divided into three variances: spending, variable efficiency, and volume.**

Actual total overhead (fixed plus variable)......................................	$178,500
Budget formula...	$110,000 + $.50 per hour
Total overhead application rate	$1.50 per hour
Actual hours worked...	121,000
Standard hours allowed for production	130,000

What was the variable efficiency variance in this department during the quarter?
A. $4,500 favorable
B. $8,000 favorable
C. $4,500 unfavorable
D. $8,000 unfavorable
E.   none of the above

SUPPORTING CALCULATION:

Budget allowance for actual hours		
[(121,000 x $.50) + $110,000]...................................		$ 170,500
Budget allowance for standard hours:		
Variable (130,000 x $.50)	$ 65,000	
Fixed	110,000	175,000
Variable efficiency variance...		$ (4,500) favorable

E   28.   **Under the two-variance method for analyzing factory overhead, the controllable (budget) variance is the difference between the:**
A.   actual fixed factory overhead and the budgeted fixed overhead
B.   budget allowance based on standard hours allowed and the factory overhead applied to production
C.   budget allowance based on standard hours allowed and the budget allowance based on actual hours worked
D.   actual factory overhead and the factory overhead applied to production
E.   actual factory overhead and the budget allowance based on standard hours allowed

A   29.   **Materials usage variances are normally chargeable to the:**
A.   Production Department
B.   Purchasing Department
C.   Finished Goods Department
D.   Materials Storage Department
E.   Factory Storeroom Department

C   30.   Todco planned to produce 3,000 units of its single product, Teragram, during November.   The standard specifications for one unit of Teragram include six pounds of material at $.30 per pound.   Actual production in November was 3,100 units of Teragram.   The accountant computed a favorable materials purchase price variance of $380 and an unfavorable materials quantity variance of $120.   Based on these variances, one could conclude that:

    A.   more materials were purchased than were used
    B.   more materials were used than were purchased
    C.   the actual cost of materials was less than the standard cost
    D.   the actual usage of materials was less than the standard allowed
    E.   actual cost and usage of materials were both less than standard

D   31.   Information on Duke Co.'s direct material costs for May is as follows:

Actual quantity of direct materials purchased and used	**30,000 lbs.**
Actual cost of direct materials	**$84,000**
Unfavorable direct materials usage variance	**3,000**
Standard quantity of direct materials allowed for May production	**29,000 lbs.**

    For the month of May, Duke's direct materials price variance was:
    A. $2,800 favorable
    B. $2,800 unfavorable
    C. $6,000 unfavorable
    D. $6,000 favorable
    E.   none of the above

    SUPPORTING CALCULATION:

$$\$3,000 = x\ (30,000 - 29,000)$$
$$1,000\ x = \$3,000$$
$$x = \$3$$
$$y = \$2.80 - \$3.00(30,000)$$
$$y = (\$6,000)\ \text{favorable}$$

A   32.   A company uses a standard cost system to account for its only product.   The materials standard per unit was 4 lbs. at $5.10 per lb.   Operating data for April were as follows:

Material used	**7,800 lbs.**
Cost of material used	**$40,950**
Number of finished units produced	**2,000**

    The material usage variance for April was:
    A. $1,020 favorable
    B. $1,050 favorable
    C. $1,170 unfavorable
    D. $1,200 unfavorable
    E.   none of the above

SUPPORTING CALCULATION:

x = $5.10 [7,800 - (2,000 x 4)]
x = ($1,020) favorable

D   33.   During the last three months, a manufacturer incurred an unfavorable labor efficiency variance. The least likely cause of this variance is:
A.   substantial materials were purchased at a discount at a previously unused supplier's liquidation
B.   for one week, only half of the workforce, those with the highest seniority, were called in to work
C.   a second production line with all new personnel was started
D.   the cost-of-living adjustment for the three-month period was $.10 more per hour than expected
E.   none of the above

D   34.   The direct labor standards for producing a unit of a product are two hours at $10 per hour. Budgeted production was 1,000 units.   Actual production was 900 units, and direct labor cost was $19,000 for 2,000 direct labor hours.   The direct labor efficiency variance was:
A. $1,000 favorable
B. $1,000 unfavorable
C. $2,000 favorable
D. $2,000 unfavorable
E.   none of the above

SUPPORTING CALCULATION:

x = $10 [2,000 - (900 x 2)]
x = $2,000 unfavorable

C   35.   Under the two-variance method for analyzing factory overhead, the factory overhead applied to production is used in the computation of the:

	Controllable (Budget) Variance	Volume Variance
A.	yes	no
B.	yes	yes
C.	no	yes
D.	no	no

D   36.   Under the three-variance method for analyzing factory overhead, which of the following is used in computation of the spending variance?

	Actual Factory Overhead	Budget Allowance Based on Actual Hours
A.	no	yes
B.	no	no
C.	yes	no
D.	yes	yes

D   37.   Compute the variable efficiency variance, using the following data:

Standard labor hours per good unit produced..	2
Good units produced..	1,000
Actual labor hours used..	2,100
Standard variable overhead per standard labor hour	$3
Actual variable overhead	$ 6,500

    A. $200 favorable
    B. $200 unfavorable
    C. $300 favorable
    D. $300 unfavorable
    E.   none of the above

SUPPORTING CALCULATION:

Variable budget allowance for actual hours (2,100 x $3).............................	$ 6,300
Variable budget allowance for standard hours	
($3 x 1,000 x 2)...	6,000
....	$ 300
....**unfavorable**	

The following questions are based on materials in the Appendix to the chapter.

A   38.   In the alternate three-variance method, the efficiency variance is:
          A.   Standard factory overhead rate x (Actual units of allocation base - Standard units of
                  allocation base allowed)
          B.   Actual factory overhead incurred - Budget allowance based on actual hours
          C.   Budget allowance based on actual hours - (Actual hours x Factory overhead rate)
          D.   Budgeted fixed factory overhead - (Actual hours x Fixed overhead rate)
          E.   none of the above

**D   39.   The four-variance method reconciles to the two-variance method by combining which of the
          following to get the controllable variance?**
          A.   fixed efficiency variance and idle capacity variance
          B.   spending variance and fixed efficiency variance
          C.   spending variance and idle capacity variance
          D.   spending variance and variable efficiency variance
          E.   none of the above

**B   40.   The four-variance method reconciles to the two-variance method by combining which of the
          following to get the volume variance?**
          A.   spending variance and variable efficiency variance
          B.   fixed efficiency variance and idle capacity variance
          C.   variable efficiency variance and fixed efficiency variance
          D.   spending variance and idle capacity variance
          E.   none of the above

PROBLEMS

PROBLEM

1.
Labor Variance Analysis.   Last National Bank uses a standard cost accounting system for analyzing its labor costs in its Proof and Transit Division.   The primary task of this division is the encoding of checks with magnetic ink for reading by the computer.   The standard calls for an employee to process 900 checks per hour and to be paid $10 per hour.   During the eight-hour night shift last Wednesday, the production levels attained by the four employees on that shift, together with their hourly wages, were:

Employee	Checks Encoded	Hourly Wages
Wilson	7,020	$11.00
Xavier...	6,480	9.25
Yelding...	7,875	10.50
Ziachin	7,425	9.75

Required: Compute the labor rate variance and the labor efficiency variance for each employee and for the entire night shift.

SOLUTION

	Wilson	Xavier	Yelding	Ziachin	Total
Actual rate...	$ 11.00	$ 9.25	$ 10.50	$ 9.75	$ 40.50
Standard rate..	10.00	10.00	10.00	10.00	40.00
Rate difference..	$ 1.00	$ (.75)	$ .50	$ (.25)	$ .50
Multiplied by hours worked.......................	x 8	x 8	x 8	x 8	x 8
Labor rate variance	$ 8.00	$ (6.00)	$ 4.00	$ (2.00)	$ 4.00
	unfav.	fav.	unfav.	fav.	unfav.
Actual hours worked...................................	8.0	8.0	8.00	8.00	32
Standard hours allowed..............................	7.8	7.2	8.75	8.25	32
Difference in hours	.2	.8	(.75)	(.25)	0
Multiplied by standard rate.......................	x $10	x $10	x $10	x $10	x $10
Labor efficiency variance	$ 2.00	$ 8.00	$ (7.50)	$ (2.50)	0
	unfav.	unfav.	fav.	fav.	

PROBLEM

2.
Materials Variance Analyses.   Healthy Dinners Inc. packages a frozen fish dinner that consists of 6 ounces of halibut, 4 ounces of asparagus, 5 ounces of rice, and 3 ounces of yogurt.   On October 1, the following price standards were set for each batch of 1,000 dinners:

	Materials Price Standard
Item	
Halibut...	$.60 per ounce
Asparagus..	.25
Rice...	.10
Yogurt...	.20

The actual cost for 1,000 dinners was: halibut, $.70 per ounce; asparagus $.20 per ounce; rice, $.12 per ounce; and yogurt, $.22 per ounce.

Quantity variances arise from the cooking process.   The materials used for the 1,000 dinners in Batch 1099 were:

Halibut..	5,500 ounces
Asparagus..	3,800
Rice...	4,900
Yogurt...	3,150

Required: Determine the materials price usage variance and the materials quantity (or usage) variance for Batch 1099.   (Indicate whether each variance is favorable or unfavorable.)

SOLUTION

(Actual unit price - Standard unit price) x Actual usage = Materials price usage variance

Halibut: ($.70 per oz. - $.60 per oz.) x 5,500 oz.	$ 550	unfav.
Asparagus: ($.20 per oz. - $.25 per oz.) x 3,800 oz...	(190)	fav.
Rice: ($.12 per oz. - $.10 per oz.) x 4,900 oz..	98	unfav.
Yogurt: ($.22 per oz. - $.20 per oz.) x 3,150 oz.	63	unfav.
Materials price usage variance..	$ 521	unfav.

(Actual quantity - Standard quantity allowed) x Standard price = Materials quantity variance

Halibut: (5,500 oz. - 6,000 oz.) x $.60..	$(300)	fav.
Asparagus: (3,800 oz. - 4,000 oz.) x $.25	(50)	fav.
Rice: (4,900 oz. - 5,000 oz.) x $.10..	(10)	fav.
Yogurt: (3,150 oz. - 3,000 oz.) x $.20...	30	unfav.
Materials quantity variance	$(330)	fav.

PROBLEM

3.
Materials Mix and Yield Variance Analysis. Kreutzer Candle Co. manufactures candles in various shapes, sizes, colors, and scents. Depending on the orders received, not all candles require the same amount of color, dye, or scent materials. Yields also vary, depending upon the usage of beeswax or synthetic wax. Standard ingredients for 1,000 lbs. of candles are:

	Standard Mix	Standard Cost per Pound
Input:		
Beeswax	200 lbs.	$1.00
Synthetic wax	840	.20
Colors	7	2.00
Scents	3	6.00
Totals	1,050 lbs.	
Standard output	1,000 lbs.	

Price variances are charged off at the time of purchase. During January, the company was busy manufacturing red candles for Valentine's Day. Actual production then was:

Input:	
Beeswax	4,100
Synthetic wax	13,800
Colors	2,200
Scents	60
Totals	20,160 lbs.
Actual output	18,500 lbs.

Required: Compute the materials mix variance and the materials yield variance. (Indicate whether each variance is favorable or unfavorable and round to three decimal places.)

SOLUTION

Actual quantities at individual standard materials cost	$ 11,620[1]
Actual input quantity at weighted average of standard materials cost (20,160 x $.381[2])	$ 7,681
Materials mix variance	$ 3,939
unfav.	
Actual input quantity at weighted average of standard materials cost (20,160 x $.381[2])	$ 7,681
Actual output quantity at standard materials cost per pound of output (18,500 lbs. x $.40[3])	7,400
Materials yield variance	$ 281 unfav.

[1]Beeswax	4,100 lbs.	@ $1 per lb.	$ 4,100
Synthetic wax	13,800 lbs.	@ $.20 per lb.	2,760
Colors	2,200 lbs.	@ $2 per lb.	4,400
Scents	60 lbs.	@ $6 per lb.	360
	20,160 lbs.		$ 11,620

[2]Weighted average standard materials costs:

Beeswax	200 lbs.	@ $1	$ 200
Synthetic wax	840 lbs.	@ $.20	168
Colors	7 lbs.	@ $2	14
Scents	3 lbs.	@ $6	18
	1,050 lbs.		$ 400

$$\text{Standard materials cost} = \frac{\$400}{1,050\,\text{lbs.}} = \$.381\,\text{per lb.}$$

$$\frac{[3]\text{Standard materials costs}}{\text{Standard output}} = \frac{\$400}{1,000\,\text{lbs.}} = \$.40\,\text{per lb. cost per unit of output}$$

PROBLEM

4.
Overhead Variance Analysis, Using the Two-Variance Method.   Tuxla Products Co. charges factory overhead into production at the rate of $10 per direct labor hour, based on a standard production of 15,000 direct labor hours for 15,000 units; 60% of factory overhead costs are variable.   Production data for May and June are:

	May	June
Production	12,000 hrs.	14,200 hrs.
Units produced	12,000	15,000
Actual factory overhead	$140,100	$149,300

Required: **Prepare a factory overhead variance analysis for May and June, using the two-variance method. (Indicate whether each variance is favorable or unfavorable.)**

SOLUTION

	May	June
Actual factory overhead	$ 140,100	$ 149,300
Budget allowance based on standard:		
Budgeted fixed expense (40% x $10 x 15,000 units)	(60,000)	(60,000)
Variable expenses:		
12,000 hrs. allowed x $10 x .60	(72,000)	
15,000 hrs. allowed x $10 x .60		(90,000)
Controllable variance	$ 8,100 unfav.	$ (700) fav.

Budgeted allowance based on standard
  hours allowed .... $ 132,000 $
  150,000
Standard hours allowed x Standard factory
  overhead rate:
     12,000 hrs. x $10..   (120,000)
     15,000 hrs. x $10.. _____
  (150,000)
Volume variance.. $\underline{~~~~~12,000}$ unfav. $\underline{~~~0}$

PROBLEM

5.
Overhead Variance Analysis, Using the Three-Variance Method.   Standard direct labor hours budgeted for May production were 5,000, with factory overhead at that level budgeted at $25,000, of which $15,000 is variable.   Actual labor hours for the month were 4,800; however, the number of standard labor hours allowed for actual May production is 5,200.   Actual factory overhead incurred during the month was $25,600.

Required: Compute the overall factory overhead variance and analyze it using the three-variance method (i.e., the spending variance, the variable efficiency variance, and the volume variance).   Indicate whether the variances are favorable or unfavorable.

SOLUTION

Actual factory overhead .... $ 25,600
Standard overhead chargeable to production (5,200
     standard hours allowed x $5 overhead rate)   26,000
Overall factory overhead variance... $\underline{~~~~~(400)}$ favorable

Actual factory overhead .... $ 25,600
Budget allowance based on actual hours:
     Variable overhead (4,800 actual hours x $3).................................. $14,400
     Fixed overhead   10,000   24,400
Spending variance .... $\underline{~~~~~1,200}$
     unfavorable

Budget allowance based on actual hours (from above)......................... $ 24,400
Budget allowance based on standard hours:
     Variable overhead (5,200 standard hours x $3)............................. $15,600
     Fixed overhead   10,000   25,600
Variable efficiency variance... $\underline{~~~(1,200)}$ favorable

Budget allowance based on standard hours (from above)................... $ 25,600
Standard factory overhead chargeable to production
     (from above)..   26,000
Volume variance... $\underline{~~~~~(400)}$ favorable

Spending variance .... $ 1,200
Variable efficiency variance...   (1,200)
Volume variance...   (400)
Overall factory overhead variance.. $\underline{~~~~~(400)}$ favorable

The following problem is based on the material in the Appendix to the chapter.

PROBLEM

6.
Overhead Variance Analysis, Using the Four-Variance Method.   In May, the management of Kentucky Co. received the following data for its Bluegrass Products Division:

	Standard[1]	Actual
Units produced..	5,000	5,100
Direct labor hours	10,000	10,300
Fixed factory overhead	$12,000	$13,000
Variable factory overhead...	$30,000	$34,500

[1]Denotes normal capacity used for predetermined overhead rate computation.

Required: Prepare a factory overhead variance analysis for May, using the four-variance method.   (Indicate whether each variance is favorable or unfavorable.)

SOLUTION

Actual factory overhead		$ 47,500
Budget allowance based on actual hours worked:		
Fixed factory overhead..	$12,000	
Variable factory overhead:		

$$10{,}300 \text{ actual hrs. x } \frac{\$30{,}000}{10{,}000 \text{ DLH}}$$

10,300 actual hrs. x ----------------..	30,900	42,900
Spending variance...		$ 4,600
unfav.		
Budget allowance based on actual hours worked.............................		$ 42,900
Actual hours x standard overhead rate:		

$$10{,}300 \text{ hrs. x } \frac{\$30{,}000 + \$12{,}000}{10{,}000 \text{ DLH}}$$

10,300 hrs. x --------------------------..		43,260
Idle capacity variance..		$ (360) fav.
Budget allowance based on actual hours worked.............................		$ 42,900
Budget allowance based on standard hours allowed:		
Fixed expense	$12,000	
Variable expense (10,200 standard hours		
allowed x $3 variable overhead rate)......................................	30,600	42,600
Variable efficiency variance...		$ 300
unfav.		
Actual hours (10,300) x fixed overhead rate ($1.20)........................		$ 12,360
Standard hours allowed (10,200) x fixed overhead		
rate ($1.20)		12,240

Fixed efficiency variance .... $\underline{\$\qquad\underline{120}}$
    unfav.