Chapter 10 Standard Costs and Variances Answer Key

True / False Questions

1. The materials price variance is computed by multiplying the difference between the actual price and the standard price by the actual quantity of materials used in production. **FALSE**

   AACSB: Reflective Thinking
   AICPA BB: Critical Thinking
   AICPA FN: Measurement
   Bloom's: Knowledge
   Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
   Level: Easy

2. In general, the purchasing agent is responsible for the materials price variance. **TRUE**

   AACSB: Reflective Thinking
   AICPA BB: Critical Thinking
   AICPA FN: Measurement
   Bloom's: Knowledge
   Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
   Level: Easy

3. A materials price variance is favorable if the actual price exceeds the standard price. **FALSE**

   AACSB: Reflective Thinking
   AICPA BB: Critical Thinking
   AICPA FN: Measurement
   Bloom's: Knowledge
   Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
   Level: Easy
4. Generally speaking, it is the responsibility of the production department to see that material usage is kept in line with standards.

**TRUE**

AACSB: Reflective Thinking  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Knowledge  
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance  
Level: Easy

5. When more hours of labor time are necessary to complete a job than the standard allows, the labor rate variance is unfavorable.

**FALSE**

AACSB: Reflective Thinking  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Comprehension  
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance  
Level: Medium

6. Standard costs should generally be based on the actual costs of prior periods.

**FALSE**

AACSB: Reflective Thinking  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Knowledge  
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance  
Level: Easy

7. The standard quantity per unit for direct materials should not include an allowance for waste.

**FALSE**

AACSB: Reflective Thinking  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Knowledge  
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance  
Level: Easy
Chapter 10 - Standard Costs and Variances

8. Ideal standards should be used for forecasting and planning.
   **FALSE**

9. The standard cost per unit is computed by multiplying the standard quantity or hours by the standard price or rate.
   **TRUE**

10. Standard costs greatly increase the complexity of the bookkeeping process.
    **FALSE**

**Multiple Choice Questions**
11. When computing standard cost variances, the difference between actual and standard price multiplied by actual quantity yields a(n):
A. combined price and quantity variance.
B. efficiency variance.
C. price variance.
D. quantity variance.

Materials price variance = AQ (AP - SP)

12. The general model for calculating a price variance is:
A. actual quantity of inputs × (actual price - standard price).
B. standard price × (actual quantity of inputs - standard quantity allowed for output).
C. (actual quantity of inputs at actual price) - (standard quantity allowed for output at standard price).
D. actual price × (actual quantity of inputs - standard quantity allowed for output).

Materials price variance = AQ (AP - SP)
13. The purchasing agent of the Clampett Company ordered materials of lower quality in an effort to economize on price and in response to the demands of the production manager due to a mistake in production scheduling. The materials were shipped by airfreight at a rate higher than that ordinarily charged for shipment by truck, resulting in an unfavorable materials price variance. The lower quality material proved to be unsuitable on the production line and resulted in excessive waste. In this situation, who should be held responsible for the materials price and quantity variances?

<table>
<thead>
<tr>
<th>Materials Price Variance</th>
<th>Materials Quantity Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Purchasing Agent</td>
<td>Purchasing Agent</td>
</tr>
<tr>
<td>B) Production Manager</td>
<td>Production Manager</td>
</tr>
<tr>
<td>C) Production Manager</td>
<td>Purchasing Agent</td>
</tr>
<tr>
<td>D) Purchasing Agent</td>
<td>Production Manager</td>
</tr>
</tbody>
</table>

A. Option A  
B. Option B  
C. Option C  
D. Option D

The materials price variance is the responsibility of the production manager because the unfavorable variance was due to the demands made by the production manager. The materials quantity variance is the responsibility of the purchasing agent because the purchasing agent was responsible for ordering the lower quality material.

AACSB: Reflective Thinking  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom’s: Comprehension  
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance  
Level: Medium
14. 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 $0.30 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.

Materials price variance = AQ (AP - SP)
A favorable materials price variance can only occur if the actual price of materials was less than the standard price.

15. The materials quantity variance should be computed:
A. when materials are purchased.
B. based upon the amount of materials used in production.
C. based upon the difference between the actual and standard prices per unit times the actual quantity used.
D. only when there is a difference between standard and actual cost per unit for the materials.

Materials quantity variance = (AQ - SQ)SP, where AQ is the actual quantity used.
16. Which department should usually be held responsible for an unfavorable materials price variance?
A. Production.
B. Materials Handling.
C. Engineering.
D. Purchasing.

The purchasing department should ordinarily be held responsible for an unfavorable materials price variance because that department ordinarily has most control over the price.

17. Tower Company planned to produce 3,000 units of its single product, Titactium, during November. The standards for one unit of Titactium specify six pounds of materials at $0.30 per pound. Actual production in November was 3,100 units of Titactium. There was an unfavorable materials price variance of $380 and a favorable 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 per pound for materials was less than the standard cost per pound.
D. the actual usage of materials was less than the standard allowed.

Materials quantity variance = (AQ - SQ) SP
A favorable materials quantity variance occurs only if the actual usage of materials was less than the standard allowed, i.e., if AQ < SQ.
18. If the labor efficiency variance is unfavorable, then
A. actual hours exceeded standard hours allowed for the actual output.
B. standard hours allowed for the actual output exceeded actual hours.
C. the standard rate exceeded the actual rate.
D. the actual rate exceeded the standard rate.

Labor efficiency variance = (AH - SH) SR. An unfavorable variance occurs if AH > SH.

19. A labor efficiency variance resulting from the use of poor quality materials should be charged to:
A. the production manager.
B. the purchasing agent.
C. manufacturing overhead.
D. the industrial engineering department.

The purchasing manager is usually responsible for the acquisition of poor quality materials.
20. An unfavorable direct labor efficiency variance could be caused by:
A. an unfavorable materials quantity variance.
B. an unfavorable variable overhead rate variance.
C. a favorable materials quantity variance.
D. a favorable variable overhead rate variance.

An unfavorable quantity variance could be caused by low quality materials, which in turn could cause an unfavorable labor efficiency variance.

21. Variable manufacturing overhead is applied to products on the basis of standard direct labor-hours. If the direct labor efficiency variance is unfavorable, the variable overhead efficiency variance will be:
A. favorable.
B. unfavorable.
C. either favorable or unfavorable.
D. zero.

Labor efficiency variance = (AH - SH) SR
Variable overhead efficiency variance = (AH - SH) SR
If the labor efficiency variance is unfavorable, AH > SH. If AH > SH, the variable overhead efficiency variance must also be unfavorable.
22. Which of the following statements concerning ideal standards is incorrect?
A. Ideal standards generally do not provide the best motivation for workers.
B. Ideal standards do not make allowances for waste, spoilage, and machine breakdowns.
C. Ideal standards are better suited for cash budgeting than practical standards.
D. Ideal standards may be better than practical standards when managers seek continual improvement.

Practical standards provide better forecasts of cash flows for cash budgeting than practical standards.

23. The Porter Company has a standard cost system. In July the company purchased and used 22,500 pounds of direct material at an actual cost of $53,000; the materials quantity variance was $1,875 Unfavorable; and the standard quantity of materials allowed for July production was 21,750 pounds. The materials price variance for July was:
A. $2,725 F
B. $2,725 U
C. $3,250 F
D. $3,250 U

Materials price variance = (AQ × AP) - (AQ × SP)
= $53,000 - (22,500 pounds × $2.50 per pound) = $53,000 - $56,250 = $3,250 F
24. Last month 75,000 pounds of direct material were purchased and 71,000 pounds were used. If the actual purchase price per pound was $0.50 more than the standard purchase price per pound, then the materials price variance was:

A. $2,000 F  
B. $37,500 F  
C. $37,500 U  
D. $35,500 U

Materials price variance = (AQ × AP) - (AQ × SP) = AQ (AP - SP)  
= 75,000 pounds × $0.50 per pound = $37,500 U

25. The following materials standards have been established for a particular product:

<table>
<thead>
<tr>
<th>Standard quantity per unit of output</th>
<th>7.3</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard price</td>
<td>$14.45</td>
<td>per pound</td>
</tr>
</tbody>
</table>

The following data pertain to operations concerning the product for the last month:

<table>
<thead>
<tr>
<th>Actual materials purchased</th>
<th>6,600</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual cost of materials purchased</td>
<td>91,740</td>
<td></td>
</tr>
<tr>
<td>Actual materials used in production</td>
<td>5,900</td>
<td>Pounds</td>
</tr>
<tr>
<td>Actual output</td>
<td>1,000</td>
<td>Units</td>
</tr>
</tbody>
</table>

What is the materials quantity variance for the month?

A. $19,460 F  
B. $9,730 U  
C. $10,115 U  
D. $20,230 F

SQ = 7.3 pounds per unit × 1,000 units = 7,300 pounds  
Materials quantity variance = (AQ - SQ) SP  
= (5,900 pounds - 7,300 pounds) $14.45 per pound  
= (-1,400 pounds) $14.45 per pound = $20,230 F
26. The following materials standards have been established for a particular product:

<table>
<thead>
<tr>
<th>Standard quantity per unit of output</th>
<th>4.6 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard price</td>
<td>$19.25 per foot</td>
</tr>
</tbody>
</table>

The following data pertain to operations concerning the product for the last month:

<table>
<thead>
<tr>
<th>Actual materials purchased</th>
<th>3,200 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials cost purchased</td>
<td>$63,200</td>
</tr>
<tr>
<td>Actual materials used in production</td>
<td>2,000 feet</td>
</tr>
<tr>
<td>Actual output</td>
<td>100 units</td>
</tr>
</tbody>
</table>

What is the materials price variance for the month?

A. $15,405 F  
B. $5,775 U  
C. $5,925 U  
D. $1,600 U

\[ \text{Materials price variance} = \text{AQ} \times (\text{AP} - \text{SP}) = \text{AQ} \times \text{AP} - \text{AQ} \times \text{SP} \]

\[ = \$63,200 - (3,200 \text{ feet} \times \$19.25 \text{ per foot}) \]

\[ = \$63,200 - \$61,600 = \$1,600 \text{ U} \]

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application  
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance  
Level: Easy
Chapter 10 - Standard Costs and Variances

27. The Wright Company has a standard costing system. The following data are available for September:

| Actual quantity of direct materials purchased | 25,000 pounds |
| Standard price of direct materials | $2 per pound |
| Material price variance | $2,500 unfavorable |

The actual price per pound of direct materials purchased in September is:

A. $1.85  
B. $2.00  
C. $2.10  
D. $2.15

Materials price variance = AQ (AP - SP)  
25,000 pounds (AP - $2 per pound) = $2,500 U  
25,000 pounds × AP - $50,000 = $2,500 U  
25,000 pounds × AP = $50,000  
AP = $52,500 ÷ 25,000 pounds  
AP = $2.10 per pound

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom’s: Application  
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance  
Level: Hard
28. The Cox Company uses standard costing. The following data are available for April:

| Actual quantity of direct materials used | 12,200 gallons |
| Standard price of direct materials | $4 per gallon |
| Material quantity variance | $2,000 unfavorable |

The standard quantity of material allowed for April production is:
A. 14,200 gallons  
B. 12,700 gallons  
C. 11,700 gallons  
D. 10,200 gallons

Materials quantity variance = (AQ - SQ) SP  
(12,200 gallons - SQ) $4 per gallon = $2,000 U  
($48,800 - SQ) × $4 per gallon = $2,000 U  
SQ × $4 per gallon = $46,800  
SQ = $46,800 ÷ $4 per gallon  
SQ = 11,700 gallons

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom’s: Application  
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance  
Level: Hard
29. The standard cost card for a product shows that the product should use 4 kilograms of material B per finished unit and that the standard price of material B is $4.50 per kilogram. During April, when the budgeted production level was 1,000 units, 1,040 units were actually made. A total of 4,100 kilograms of material B were used in production and the inventories of material B were reduced by 300 kilograms during April. The total cost of material B purchased during April was $14,400. The material variances for material B during April were:

<table>
<thead>
<tr>
<th>Material</th>
<th>Price Variance</th>
<th>Quantity Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>$2,700 F</td>
<td>$1,620 F</td>
</tr>
<tr>
<td>B1</td>
<td>$2,700 F</td>
<td>$900 F</td>
</tr>
<tr>
<td>C1</td>
<td>$4,050 F</td>
<td>$270 F</td>
</tr>
<tr>
<td>D1</td>
<td>$4,050 F</td>
<td>$1,620 F</td>
</tr>
</tbody>
</table>

A. Option A  
B. Option B  
C. Option C  
D. Option D

Beginning balance of raw materials + Purchases of raw materials = Materials used in production + Ending balance of raw materials
Purchases of raw materials = Materials used in production + Ending balance of raw materials - Beginning balance of raw materials
Purchases of raw materials = Materials used in production + (Ending balance of raw materials - Beginning balance of raw materials) = 4,100 kilograms + (-300 kilograms) = 3,800 kilograms
Materials price variance = AQ (AP - SP)
=$14,400 - (3,800 kilograms $4.50 per kilogram)
=$14,400 - $17,100 = $2,700 F
Materials quantity variance = (AQ - SQ) SP = AQ \times SP - SQ \times SP
= $18,450 - (1,040 units 4 kilograms per unit) \times $4.50 per kilogram
= $18,450 - $18,720 = $270 F

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Hard
Source: CMA, adapted
30. The following labor standards have been established for a particular product:

<table>
<thead>
<tr>
<th>Standard labor hours per unit of output</th>
<th>4.0 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard labor rate</td>
<td>$12.30 per hour</td>
</tr>
</tbody>
</table>

The following data pertain to operations concerning the product for the last month:

<table>
<thead>
<tr>
<th>Actual hours worked</th>
<th>7,100 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual total labor cost</td>
<td>$93,105</td>
</tr>
<tr>
<td>Actual output</td>
<td>1,500 units</td>
</tr>
</tbody>
</table>

What is the labor efficiency variance for the month?

A. $13,805 U  
B. $13,530 U  
C. $15,305 U  
D. $15,305 F

\[ \text{SH} = 1,500 \text{ units} \times 4 \text{ hours per unit} = 6,000 \text{ hours} \]

Labor efficiency variance = \( (\text{AH} - \text{SH}) \times \text{SR} \)

\[ = (7,100 \text{ hours} - 6,000 \text{ hours}) \times 12.30 \text{ per hour} \]

\[ = (1,100 \text{ hours}) \times 12.30 \text{ per hour} = $13,530 \text{ U} \]

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application  
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance  
Level: Easy
31. The following labor standards have been established for a particular product:

<table>
<thead>
<tr>
<th>Standard labor-hours per unit of output (1.5 hours)</th>
<th>Standard labor rate ($47.55 per hour)</th>
</tr>
</thead>
</table>

The following data pertain to operations concerning the product for the last month:

<table>
<thead>
<tr>
<th>Actual hours worked</th>
<th>Actual total labor cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,300 hours</td>
<td>$94,340</td>
</tr>
</tbody>
</table>

What is the labor rate variance for the month?

A. $1,325 U
B. $1,780 F
C. $430 F
D. $430 U

\[ AH \times AR = $94,340 \]

Labor rate variance = \( AH \times (AR - SR) = AH \times AR - AH \times SR \)

\[ = $94,340 - (5,300 \text{ hours} \times $17.55 \text{ per hour}) = $1,325 \text{ U} \]
32. The standards for direct labor for a product are 2.5 hours at $8 per hour. Last month, 9,000 units of the product were made and the labor efficiency variance was $8,000 F. The actual number of hours worked during the past period was:

A. 23,500  
B. 22,500  
C. 20,500  
**D. 21,500**

\[
SH = 9,000 \text{ units} \times 2.5 \text{ hours per unit} = 22,500 \text{ hours}
\]

Labor efficiency variance = \((AH - SH) \times SR\)

\[
= (AH - 22,500 \text{ hours}) \times $8 \text{ per hour} = -$8,000
\]

\[
AH \times $8 \text{ per hour} - $180,000 = -$8,000
\]

\[
AH \times $8 \text{ per hour} = $172,000
\]

\[
AH = $172,000 \div $8 \text{ per hour}
\]

\[
AH = 21,500 \text{ hours}
\]
33. The Reedy Company uses a standard costing system. The following data are available for November:

<table>
<thead>
<tr>
<th>Actual direct labor-hours worked</th>
<th>5,800 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard direct labor rate</td>
<td>$9 per hour</td>
</tr>
<tr>
<td>Labor rate variance</td>
<td>$1,160 favorable</td>
</tr>
</tbody>
</table>

The actual direct labor rate for November is:

A. $8.80  
B. $8.90  
C. $9.00  
D. $9.20  

Labor rate variance = AH(AR - SR)
5,800 hours (AR - $9 per hour) = -$1,160
5,800 hours × AR - $52,200 = -$1,160
5,800 hours × AR = $51,040
AR = $51,040 ÷ 5,800 hours
AR = $8.80 per hour

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application  
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance  
Level: Hard
34. Borden Enterprises uses standard costing. For the month of April, the company reported the following data:

- Standard direct labor rate: $10 per hour
- Standard hours allowed for actual production: 8,000 hours
- Actual direct labor rate: $9.50 per hour
- Labor efficiency variance: $4,800 Favorable

The labor rate variance for April is:

A. $3,760 U  
B. $3,760 F  
C. $2,850 F  
D. $2,850 U

Labor efficiency variance = (AH - SH) SR  
= (AH - 8,000 hours) $10 per hour = -$4,800  
AH × $10 per hour - $80,000 = -$4,800  
AH × $10 per hour = $75,200  
AH = $75,200 ÷ $10 per hour  
AH = 7,520

Labor rate variance = AH(AR - SR)  
= 7,520 hours ($9.50 per hour - $10.00 per hour)  
= 7,520 hours (-$0.50 per hour) = $3,760 F
35. Furson Corporation makes a single product. In a recent period 6,500 units were made and there was an unfavorable labor efficiency variance of $26,000. Direct labor workers were paid $8 per hour and total wages were $182,000. The labor rate variance was zero. The standard labor-hours per unit of output is closest to:

A. 3.0
B. 3.5
C. 4.0
D. 4.5

\[ AH = \frac{182,000}{8 \text{ per hour}} = 22,750 \text{ hours} \]

Labor rate variance = \[ AH(AR - SR) \]
\[ 0 = 22,750 \text{ hours} (8 \text{ per hour} - SR) \]
\[ SR = 8 \text{ per hour} \]

Labor efficiency variance = \[ (AH - SH) \cdot SR \]
\[ 26,000 = (22,750 \text{ hours} - 6,500 \text{ units} \times Standard \text{ hours per unit}) \cdot 8 \text{ per hour} \]
\[ (22,750 \text{ hours} - 6,500 \text{ units} \times Standard \text{ hours per unit}) = \frac{26,000}{8 \text{ per hour}} \]
\[ (22,750 \text{ hours} - 6,500 \text{ units} \times Standard \text{ hours per unit}) = 3,250 \text{ hours} \]

6,500 units \times Standard \text{ hours per unit} = 19,500 \text{ hours}

Standard hours per unit = \[ \frac{19,500 \text{ hours}}{6,500 \text{ units}} = 3 \text{ hours per unit} \]
36. The following standards for variable manufacturing overhead have been established for a company that makes only one product:

<table>
<thead>
<tr>
<th>Standard hours per unit of output</th>
<th>2.7 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard variable overhead rate</td>
<td>$13.05</td>
</tr>
</tbody>
</table>

The following data pertain to operations for the last month:

<table>
<thead>
<tr>
<th>Actual hours</th>
<th>2,400 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual total variable manufacturing overhead cost</td>
<td>$30,600</td>
</tr>
<tr>
<td>Actual output</td>
<td>600 units</td>
</tr>
</tbody>
</table>

What is the variable overhead efficiency variance for the month?

A. $9,219 U  
B. $10,179 U  
C. $9,867 U  
D. $648 U

SH = 600 units × 2.7 hours per unit = 1,620 hours
Variable overhead efficiency variance = (AH - SH) SR
= (2,400 hours - 1,620 hours) $13.05 per hour
= (780 hours) $13.05 per hour = $10,179 U
37. The following standards for variable manufacturing overhead have been established for a company that makes only one product:

<table>
<thead>
<tr>
<th>Standard hours per unit of output</th>
<th>5.0 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard variable overhead rate</td>
<td>$13.45 per hour</td>
</tr>
</tbody>
</table>

The following data pertain to operations for the last month:

<table>
<thead>
<tr>
<th>Actual hours</th>
<th>3,300 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual total variable manufacturing overhead cost</td>
<td>$45,375</td>
</tr>
<tr>
<td>Actual output</td>
<td>800 units</td>
</tr>
</tbody>
</table>

What is the variable overhead rate variance for the month?
A. $1,200 F
B. $9,625 F
C. $8,425 F
D. $990 U

Variable overhead rate variance = AH (AR - SR) = AH × AR - AH × SR
= $45,375 - (3,300 hours × $13.45 per hour)
= $45,375 - $44,385 = $990 U
38. Millonzi Corporation has a standard cost system in which it applies manufacturing overhead to products on the basis of standard machine-hours (MHs). The company has provided the following data for the most recent month:

<table>
<thead>
<tr>
<th>Budgeted level of activity</th>
<th>5,500 MHs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual level of activity</td>
<td>5,300 MHs</td>
</tr>
<tr>
<td>Standard variable manufacturing overhead rate</td>
<td>$8.50 per MH</td>
</tr>
<tr>
<td>Actual total variable manufacturing overhead</td>
<td>$42,400</td>
</tr>
</tbody>
</table>

What was the variable overhead rate variance for the month?

A. $4,350 favorable  
B. $2,000 unfavorable  
C. $2,650 favorable  
D. $1,700 favorable

Variable overhead rate variance = AH (AR - SR) = AH × AR - AH × SR
= $42,400 - (5,300 hours × $8.50 per hour)
= $42,400 - $45,050 = $2,650 F
39. Lafountaine Manufacturing Corporation has a standard cost system in which it applies manufacturing overhead to products on the basis of standard machine-hours (MHs). The company's cost formula for variable manufacturing overhead is $4.70 per MH. During the month, the actual total variable manufacturing overhead was $20,210 and the actual level of activity for the period was 4,700 MHs. What was the variable overhead rate variance for the month?

A. $400 unfavorable
B. $1,880 favorable
C. $1,880 unfavorable
D. $400 favorable

Variable overhead rate variance = \( AH \times (AR - SR) = AH \times AR - AH \times SR \)
= $20,210 - (4,700 \text{ hours} \times $4.70 \text{ per hour})
= $20,210 - $22,090 = $1,880 \text{ F}
40. Dowen Corporation applies manufacturing overhead to products on the basis of standard machine-hours. For the most recent month, the company based its budget on 4,400 machine-hours. Budgeted and actual overhead costs for the month appear below:

The company actually worked 4,460 machine-hours during the month. The standard hours allowed for the actual output were 4,310 machine-hours for the month. What was the overall variable overhead efficiency variance for the month?

A. $2,198 favorable  
B. $1,695 unfavorable  
C. $150 unfavorable  
D. $503 favorable

\[
\text{Variable overhead} = \$21,560 + \$28,160 = \$49,720 \\
\text{SR} = \frac{\$49,720}{4,400 \text{ hours}} = \$11.30 \text{ per hour} \\
\text{Variable overhead efficiency variance} = (\text{AH} - \text{SH}) \times \text{SR} \\
= (4,460 \text{ hours} - 4,310 \text{ hours}) \times \$11.30 \text{ per hour} \\
= (150 \text{ hours}) \times \$11.30 \text{ per hour} = \$1,695 \text{ U}
\]
41. Ruston Corporation applies manufacturing overhead to products on the basis of standard machine-hours. Budgeted and actual overhead costs for the most recent month appear below:

<table>
<thead>
<tr>
<th>Original Budget</th>
<th>Actual Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplies</td>
<td>$ 9,000</td>
</tr>
<tr>
<td>Direct labor</td>
<td>26,640</td>
</tr>
<tr>
<td>Total variable manufacturing overhead cost</td>
<td>$35,550</td>
</tr>
</tbody>
</table>

The original budget was based on 4,500 machine-hours. The company actually worked 4,590 machine-hours during the month and the standard hours allowed for the actual output were 4,700 machine-hours. What was the overall variable overhead efficiency variance for the month?

A. $50 unfavorable  
B. $869 favorable  
C. $969 unfavorable  
D. $100 unfavorable

\[ SR = \frac{35,550}{4,500} \text{ hours} = 7.90 \text{ per hour} \]

Variable overhead efficiency variance = (\( AH - SH \)) \( SR \)

= (4,590 hours - 4,700 hours) \( \times \) 7.90 per hour

= (-110 hours) \( \times \) 7.90 per hour = $869 \text{ F}

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application  
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance  
Level: Hard
42. Tavorn Corporation applies manufacturing overhead to products on the basis of standard machine-hours. The company's standard variable manufacturing overhead rate is $1.80 per machine-hour. The actual variable manufacturing overhead cost for the month was $13,080. The original budget for the month was based on 7,100 machine-hours. The company actually worked 7,210 machine-hours during the month. The standard hours allowed for the actual output of the month totaled 7,070 machine-hours. What was the variable overhead efficiency variance for the month?

A. $354 unfavorable
B. $252 unfavorable
C. $54 favorable
D. $102 unfavorable

Variable overhead efficiency variance = (AH - SH) SR
= (7,210 hours - 7,070 hours) $1.80 per hour
= (140 hours) $1.80 per hour = $252 U
43. Kornfeld Corporation produces metal telephone poles. In the most recent month, the company budgeted production of 2,800 poles. Actual production was 3,200 poles. According to standards, each pole requires 2.2 machine-hours. The actual machine-hours for the month were 6,890 machine-hours. The standard variable manufacturing overhead rate is $9.20 per machine-hour. The actual variable manufacturing cost for the month was $67,020. The variable overhead efficiency variance is:

A. $1,380 U  
B. $1,380 F  
C. $2,252 F  
D. $2,252 U

\[ SH = 3,200 \text{ poles} \times 2.2 \text{ hours per pole} = 7,040 \text{ hours} \]

\[ \text{Variable overhead efficiency variance} = (AH - SH) \times SR \]

\[ = (6,890 \text{ hours} - 7,040 \text{ hours}) \times $9.20 \text{ per hour} \]

\[ = (-150 \text{ hours}) \times $9.20 \text{ per hour} = $1,380 \text{ F} \]
44. Acri Corporation produces large commercial doors for warehouses and other facilities. In the most recent month, the company budgeted production of 6,900 doors. Actual production was 7,300 doors. According to standards, each door requires 5.6 machine-hours. The actual machine-hours for the month were 40,360 machine-hours. The standard supplies cost, and element of variable manufacturing overhead, is $4.20 per machine-hour. The actual supplies cost for the month was $168,251. The variable overhead efficiency variance for supplies cost is:

A. $3,445 U  
B. $2,184 F  
C. $2,184 U  
D. $3,445 F

\[
SH = 7,300 \text{ doors} \times 5.6 \text{ hours per door} = 40,880 \text{ hours}
\]

\[
\text{Variable overhead efficiency variance} = (AH - SH) \times SR
\]

\[
= (40,360 \text{ hours} - 40,880 \text{ hours}) \times $4.20 \text{ per hour}
\]

\[
= (-520 \text{ hours}) \times $4.20 \text{ per hour} = $2,184 \text{ F}
\]
45. The following data have been provided by Spraglin Corporation, a company that produces forklift trucks:

<table>
<thead>
<tr>
<th>Budgeted production</th>
<th>6,000 trucks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard machine-hours per truck</td>
<td>3.7 machine-hours</td>
</tr>
<tr>
<td>Standard supplies cost</td>
<td>$5.20 per machine-hour</td>
</tr>
<tr>
<td>Actual production</td>
<td>6,200 trucks</td>
</tr>
<tr>
<td>Actual machine-hours</td>
<td>23,160 machine-hours</td>
</tr>
<tr>
<td>Actual supplies cost (total)</td>
<td>$53,111</td>
</tr>
</tbody>
</table>

Supplies cost is an element of variable manufacturing overhead. The variable overhead efficiency variance for supplies cost is:

A. $484 U
B. $2,643 U
C. $484 F
D. $2,643 F

SH = 6,200 trucks × 3.7 hours per truck = 22,940 hours
Variable overhead efficiency variance = (AH - SH) SR
= (23,160 hours - 22,940 hours) $2.20 per hour
= (220 hours) $2.20 per hour = $484 U

The Litton Company has established standards as follows:
Direct material: 3 pounds per unit @ $4 per pound = $12 per unit
Direct labor: 2 hours per unit @ $8 per hour = $16 per unit
Variable manufacturing overhead: 2 hours per unit @ $5 per hour = $10 per unit
Actual production figures for the past year are given below. The company records the materials price variance when materials are purchased.

<table>
<thead>
<tr>
<th>Units produced</th>
<th>600 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct material used</td>
<td>2,000 pounds</td>
</tr>
<tr>
<td>Direct material purchased (3,000 pounds)</td>
<td></td>
</tr>
<tr>
<td>Direct labor cost (1,100 hours)</td>
<td>$9,240</td>
</tr>
<tr>
<td>Variable manufacturing overhead cost incurred</td>
<td>$5,720</td>
</tr>
</tbody>
</table>

The company applies variable manufacturing overhead to products on the basis of standard direct labor-hours.
46. The materials price variance is:
   A. $400 U  
   B. $400 F  
   C. $600 F  
   D. $600 U  

Materials price variance = (AQ \times AP) - (AQ \times SP) 
$11,400 - (3,000 \text{ pounds} \times $4 \text{ per pound}) 
$11,400 - $12,000 = $600 \text{ F}$
48. The labor rate variance is:
   A. $480 F
   B. $480 U
   C. $440 F
   D. $440 U

   Labor rate variance = AH (AR - SR) = AH × AR - AH × SR
   = $9,240 - (1,100 hours × $8 per hour)
   = $9,240 - $8,800 = $440 U

49. The labor efficiency variance is:
   A. $800 F
   B. $800 U
   C. $840 F
   D. $840 U

   SH = 600 units × 2 hours per unit = 1,200 hours
   Labor efficiency variance = (AH - SH) SR
   = (1,100 hours - 1,200 hours) $8 per hour
   = (-100 hours) $8 per hour = $800 F
50. The variable overhead rate variance is:
A. $240 U  
B. $220 U  
C. $220 F  
D. $240 F

Variable overhead rate variance = (AH \times AR) - (AH \times SR)
= $5,720 - (1,100 \text{ hours} \times $5.00 \text{ per hour})
= $5,720 - $5,500 = $220 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy

51. The variable overhead efficiency variance is:
A. $520 F  
B. $520 U  
C. $500 U  
D. $500 F

Variable overhead efficiency variance = (AH - SH) SR
= (1,100 \text{ hours} - 1,200 \text{ hours}) $5.00 \text{ per hour}
= (-100 \text{ hours}) $5.00 \text{ per hour} = $500 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy
Cox Engineering performs cement core tests in its laboratory. The following standards have been set for each core test performed:

<table>
<thead>
<tr>
<th>Direct materials</th>
<th>Standard Hours or Quantity</th>
<th>Standard Price or Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 pounds</td>
<td>$6.75 per pound</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.4 hours</td>
<td>$12 per hour</td>
</tr>
</tbody>
</table>
| Variable
manufacturing overhead | 0.4 hours | $9 per hour |

During March, the laboratory performed 2,000 core tests. On March 1 no direct materials (sand) were on hand. Variable manufacturing overhead is assigned to core tests on the basis of standard direct labor-hours. The following events occurred during March:

- 8,600 pounds of sand were purchased at a cost of $7,310.
- 7,200 pounds of sand were used for core tests.
- 840 actual direct labor-hours were worked at a cost of $8,610.
- Actual variable manufacturing overhead incurred was $3,200.

52. The materials price variance for March is:
   A. $860 unfavorable
   B. $860 favorable
   C. $281 unfavorable
   D. $281 favorable

   Materials price variance = AQ (AP - SP) = AQ \times AP - AQ \times SP
   = $7,310 - (8,600 pounds \times $0.75 per pound)
   = $7,310 - $6,450 = $860 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Medium
53. The materials quantity variance for March is:
A. $900 favorable
B. $1,950 favorable
C. $1,950 unfavorable
D. $900 unfavorable

SQ = 3 pounds per unit \times 2,000 \text{ units} = 6,000 \text{ pounds}
Materials quantity variance = (AQ - SQ) SP
= (7,200\text{ pounds} \text{ -} 6,000 \text{ pounds}) \times 0.75 \text{ per pound}
= (1,200 \text{ pounds}) \times 0.75 \text{ per pound} = $900 \text{ U}

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Medium

54. The labor rate variance for March is:
A. $4,578 unfavorable
B. $1,470 unfavorable
C. $4,578 favorable
D. $1,470 favorable

Labor rate variance = AH (AR - SR) = AH \times AR - AH \times SR
= $8,610 - (840 \text{ hours} \times $12 \text{ per hour})
= $8,610 - $10,080 = $1,470 \text{ F}

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Level: Medium
Chapter 10 - Standard Costs and Variances

55. The labor efficiency variance for March is:
A. $480 favorable
B. $480 unfavorable
C. $192 favorable
D. $192 unfavorable

SH = 2,000 tests × 0.4 hours per test = 800 hours
Labor efficiency variance = (AH - SH) SR
= (840 hours - 800 hours) $12 per hour
= (40 hours) $12 per hour = $480 U

56. The variable overhead efficiency variance for March is:
A. $320 unfavorable
B. $320 favorable
C. $360 unfavorable
D. $360 favorable

SH = 2,000 tests × 0.4 hours per test = 800 hours
Variable overhead efficiency variance = (AH - SH) SR
= (840 hours - 800 hours) $9 per hour
= (40 hours) $9 per hour = $360 U
Hurren Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity per Unit</th>
<th>Standard Price or Rate</th>
<th>Standard Cost Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>4.4 grams</td>
<td>$8.00 per gram</td>
<td>$35.20</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.7 hours</td>
<td>$19.00 per hour</td>
<td>$13.30</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.7 hours</td>
<td>$4.00 per hour</td>
<td>$2.80</td>
</tr>
</tbody>
</table>

The company reported the following results concerning this product in June.

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

57. The materials quantity variance for June is:
   A. $1,760 U
   B. $1,782 F
   C. $1,760 F
   D. $1,782 U

\[ SQ = 6,500 \text{ units} \times 4.4 \text{ grams per unit} = 28,600 \text{ grams} \]

\[ \text{Materials quantity variance} = (AQ - SQ) \times SP \]
\[ = (28,380 \text{ grams} - 28,600 \text{ grams}) \times $8.00 \text{ per gram} \]
\[ = (-220 \text{ grams}) \times $8.00 \text{ per gram} = $1,760 \text{ F} \]
58. The materials price variance for June is:
   A. $3,180 U
   B. $2,860 F
   C. $2,860 U
   D. $3,180 F

   Materials price variance = AQ (AP - SP)
   = 31,800 grams ($8.10 per gram - $8.00 per gram)
   = 31,800 grams ($0.10 per gram) = $3,180 U

59. The labor efficiency variance for June is:
   A. $995 U
   B. $950 U
   C. $995 F
   D. $950 F

   SH = 6,500 units \times 0.7 \text{ hours per unit} = 4,550 \text{ hours}
   Labor efficiency variance = (AH - SH) SR
   = (4,500 \text{ hours} - 4,550 \text{ hours}) \$19 \text{ per hour}
   = (-50 \text{ hours}) \$19 \text{ per hour} = $950 F
60. The labor rate variance for June is:
A. $4,095 F
B. $4,050 F
C. $4,095 U
D. $4,050 U

Labor rate variance = AH(AR - SR)
= 4,500 hours ($19.90 per hour - $19.00 per hour)
= 4,500 hours ($0.90 per hour) = $4,050 U

61. The variable overhead efficiency variance for June is:
A. $185 F
B. $200 U
C. $185 U
D. $200 F

SH = 6,500 units \times 0.7 \text{ hours per unit} = 4,550 \text{ hours}
Variable overhead efficiency variance = (AH - SH) SR
= (4,500 hours - 4,550 hours) $4 \text{ per hour}
= (-50 hours) $4 \text{ per hour} = $200 F
62. The variable overhead rate variance for June is:
A. $1,365 U
B. $1,365 F
C. $1,350 F
D. $1,350 U

Variable overhead rate variance = AH(AR - SR)
= 4,500 hours ($3.70 per hour - $4.00 per hour)
= 4,500 hours (-$0.30 per hour) = $1,350 F

Snuggs Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity or Hours</th>
<th>Standard Price or Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>2.8 ounces</td>
<td>$6.00 per ounce</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.3 hours</td>
<td>$24.00 per hour</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.3 hours</td>
<td>$4.00 per hour</td>
</tr>
</tbody>
</table>

The company reported the following results concerning this product in October.

<table>
<thead>
<tr>
<th>Actual output</th>
<th>1,100 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw materials used in production</td>
<td>2,790 ounces</td>
</tr>
<tr>
<td>Actual direct labor-hours</td>
<td>350 hours</td>
</tr>
<tr>
<td>Purchases of raw materials</td>
<td>5,100 ounces</td>
</tr>
<tr>
<td>Actual price of raw materials purchased</td>
<td>$6.20 per ounce</td>
</tr>
<tr>
<td>Actual direct labor rate</td>
<td>$25.50 per hour</td>
</tr>
<tr>
<td>Actual variable overhead rate</td>
<td>$4.19 per hour</td>
</tr>
</tbody>
</table>

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.
63. The materials quantity variance for October is:
A. $1,798 U
B. $1,798 F
C. $1,740 F
D. $1,740 U

SQ = 2.8 ounces per unit \times 1,100 \text{ units} = 3,080 \text{ ounces}

Materials quantity variance = (AQ - SQ) SP
= (2,790 ounces - 3,080 ounces) $6.00 per ounce
= (-290 ounces) $6.00 per ounce = $1,740 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Easy

64. The materials price variance for October is:
A. $620 F
B. $616 F
C. $616 U
D. $620 U

Materials price variance = AQ (AP - SP)
= 3,100 ounces ($6.20 per ounce - $6.00 per ounce)
= 3,100 ounces ($0.20 per ounce) = $620 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Easy
65. The labor efficiency variance for October is:
   A. $510 U
   B. $480 F
   C. $480 U
   D. $510 F

   \[ \text{SH} = 1,100 \text{ units} \times 0.3 \text{ hours per unit} = 330 \text{ hours} \]
   Labor efficiency variance = (AH - SH) SR
   = (350 hours - 330 hours) $24.00 per hour
   = (20 hours) $24.00 per hour = $480 U

66. The labor rate variance for October is:
   A. $495 U
   B. $495 F
   C. $525 U
   D. $525 F

   Labor rate variance = AH(AR - SR)
   = 350 hours ($25.50 per hour - $24.00 per hour)
   = 350 hours ($1.50 per hour) = $525 U
67. The variable overhead efficiency variance for October is:
A. $82 \text{ U}
B. $80 \text{ U}
C. $82 \text{ F}
D. $80 \text{ F}

SH = 1,100 \text{ units} \times 0.3 \text{ hours per unit} = 330 \text{ hours}
Variable overhead efficiency variance = (AH - SH) SR
= (350 \text{ hours} - 330 \text{ hours}) \times $4.00 \text{ per hour}
= (20 \text{ hours}) \times $4.00 \text{ per hour} = $80 \text{ U}

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy

68. The variable overhead rate variance for October is:
A. $33 \text{ F}
B. $35 \text{ U}
C. $35 \text{ F}
D. $33 \text{ U}

Variable overhead rate variance = AH(AR - SR)
= 350 \text{ hours} \times ($4.10 \text{ per hour} - $4.00 \text{ per hour})
= 350 \text{ hours} \times ($0.10 \text{ per hour}) = $35 \text{ U}

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy
Kibodeaux Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity or Hours</th>
<th>Standard Price or Rate</th>
<th>Standard Cost Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>9.8 liters</td>
<td>$5.00 per liter</td>
<td>$49.00</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.4 hours</td>
<td>$22.00 per hour</td>
<td>$8.80</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.1 hours</td>
<td>$3.00 per hour</td>
<td>$0.30</td>
</tr>
</tbody>
</table>

The company budgeted for production of 3,300 units in June, but actual production was 3,400 units. The company used 33,240 liters of direct material and 320 direct labor-hours to produce this output. The company purchased 35,900 liters of the direct material at $4.90 per liter. The actual direct labor rate was $22.70 per hour and the actual variable overhead rate was $2.70 per hour.

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

69. The materials quantity variance for June is:
A. $392 U
B. $392 F
C. $400 F
D. $400 U

SQ = 3,400 units × 9.8 liters per unit = 33,320 liters
Materials quantity variance = (AQ - SQ) SP
= (33,240 liters - 33,320 liters) $5.00 per liter
= (-80 liters) $5.00 per liter = $400 F
Chapter 10 - Standard Costs and Variances

70. The materials price variance for June is:
   A. $3,332 F
   B. $3,590 U
   C. $3,332 U
   D. $3,590 F

   Materials price variance = AQ (AP - SP)
   = 35,900 liters ($4.90 per liter - $5.00 per liter)
   = 35,900 liters (-$0.10 per liter) = $3,590 F

71. The labor efficiency variance for June is:
   A. $454 F
   B. $454 U
   C. $440 F
   D. $440 U

   SH = 3,400 units × 0.1 hour per unit = 340 hours
   Labor efficiency variance = (AH - SH) SR
   = (320 hours - 340 hours) $22 per hour
   = (-20 hours) $22 per hour = $440 F
72. The labor rate variance for June is:
A. $238 U
B. $238 F
C. $224 U
D. $224 F

Labor rate variance = AH(AR - SR)
= 320 hours ($22.70 per hour - $22.00 per hour)
= 320 hours ($0.70 per hour) = $224 U

73. The variable overhead efficiency variance for June is:
A. $54 F
B. $54 U
C. $60 F
D. $60 U

SH = 3,400 units \times 0.1 \text{ hour per unit} = 340 \text{ hours}

Variable overhead efficiency variance = (AH - SH) SR
= (320 hours - 340 hours) $3 per hour
= (-20 hours) $3 per hour = $60 F
74. The variable overhead rate variance for June is:
A. $96 U
B. $102 F
C. $96 F
D. $102 U

Variable overhead rate variance = AH(AR - SR)
= 320 hours ($2.70 per hour - $3.00 per hour)
= 320 hours (-$0.30 per hour) = $96 F

Gentile Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity or Hours</th>
<th>Standard Price or Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>6.6 kilos</td>
<td>$5.00 per kilo</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.8 hours</td>
<td>$14.00 per hour</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.8 hours</td>
<td>$3.00 per hour</td>
</tr>
</tbody>
</table>

The company produced 6,000 units in May using 36,970 kilos of direct material and 4,340 direct labor-hours. During the month, the company purchased 40,400 kilos of the direct material at $4.70 per kilo. The actual direct labor rate was $13.70 per hour and the actual variable overhead rate was $2.70 per hour.
The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.
Chapter 10 - Standard Costs and Variances

75. The materials quantity variance for May is:
A. $13,150 F
B. $12,361 F
C. $13,150 U
D. $12,361 U

\[ \text{Materials quantity variance} = (\text{AQ} - \text{SQ}) \times \text{SP} \]
\[ = (36,970 \text{ kilos - 39,600 kilos}) \times 5.00 \text{ per kilo} \]
\[ = (-2,630 \text{ kilos}) \times 5.00 \text{ per kilo} = $13,150 F \]

AADSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Easy

76. The materials price variance for May is:
A. $11,880 U
B. $11,880 F
C. $12,120 F
D. $12,120 U

\[ \text{Materials price variance} = \text{AQ} \times (\text{AP} - \text{SP}) \]
\[ = 40,400 \text{ kilos} \times (4.70 \text{ per kilo} - 5.00 \text{ per kilo}) \]
\[ = 40,400 \text{ kilos} \times (-0.30 \text{ per kilo}) = $12,120 F \]

AADSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Easy
77. The labor efficiency variance for May is:
A. $6,302 U
B. $6,440 U
C. $6,440 F
D. $6,302 F

SH = 6,000 units × 0.8 hour per unit = 4,800 hours
Labor efficiency variance = (AH - SH) SR
= (4,340 hours - 4,800 hours) $14 per hour
= (-460 hours) $14 per hour = $6,440 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Level: Easy

78. The labor rate variance for May is:
A. $1,302 U
B. $1,440 U
C. $1,440 F
D. $1,302 F

Labor rate variance = AH(AR - SR)
= 4,340 hours ($13.70 per hour - $14.00 per hour)
= 4,340 hours (-$0.30 per hour) = $1,302 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Level: Easy
79. The variable overhead efficiency variance for May is:
A. $1,380 F
B. $1,242 U
C. $1,242 F
D. $1,380 U

\[ SH = 6,000 \text{ units} \times 0.8 \text{ hour per unit} = 4,800 \text{ hours} \]
Variable overhead efficiency variance = (AH - SH) SR
= (4,340 hours - 4,800 hours) $3.00 per hour
= (-460 hours) $3.00 per hour = $1,380 F

AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy

80. The variable overhead rate variance for May is:
A. $1,440 U
B. $1,302 F
C. $1,302 U
D. $1,440 F

Variable overhead rate variance = AH(AR - SR)
= 4,340 hours ($2.70 per hour - $3.00 per hour)
= 4,340 hours (-$0.30 per hour) = $1,302 F

AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy
Tidd Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity or Hours</th>
<th>Standard Rate or Price per Unit</th>
<th>Standard Cost Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>4.7 grams</td>
<td>$3.00 per gram</td>
<td>$14.10</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.8 hours</td>
<td>$16.00 per hour</td>
<td>$12.80</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.8 hours</td>
<td>$4.00 per hour</td>
<td>$3.20</td>
</tr>
</tbody>
</table>

The company reported the following results concerning this product in November.

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

81. The materials quantity variance for November is:
   A. $7,530 U
   B. $7,028 U
   C. $7,530 F
   D. $7,028 F

SQ = 9,000 units × 4.7 grams per unit = 42,300 grams
Materials quantity variance = (AQ - SQ) SP
= (44,810 grams - 42,300 grams) $3.00 per gram
= (2,510 grams) $3.00 per gram = $7,530 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Medium
82. The materials price variance for November is:
A. $8,460 F
B. $8,460 U
C. $9,460 U
D. $9,460 F

Materials price variance = (AQ × AP) - (AQ × SP)
= $132,440 - (47,300 grams × $3.00 per gram)
= $132,440 - $141,900 = $9,460 F

83. The labor efficiency variance for November is:
A. $10,720 U
B. $10,720 F
C. $10,653 U
D. $10,653 F

SH = 9,000 units × 0.8 hour per unit = 7,200 hours
Labor efficiency variance = (AH - SH) SR
= (7,870 hours - 7,200 hours) $16 per hour
= (670 hours) $16 per hour = $10,720 U
84. The labor rate variance for November is:
   A. $787 U
   B. $720 F
   C. $787 F
   D. $720 U

   Labor rate variance = \((\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR})\)
   = $125,133 - (7,870 \text{ hours} \times $16.00 \text{ per hour})
   = $125,133 - $125,920 = $787 F

85. The variable overhead efficiency variance for November is:
   A. $2,680 F
   B. $2,546 F
   C. $2,680 U
   D. $2,546 U

   \(\text{SH} = 9,000 \text{ units} \times 0.8 \text{ hour per unit} = 7,200 \text{ hours}\)
   Variable overhead efficiency variance = \((\text{AH} - \text{SH}) \times \text{SR}\)
   = (7,870 \text{ hours} - 7,200 \text{ hours}) \times $4 \text{ per hour}
   = (670 \text{ hours}) \times $4 \text{ per hour} = $2,680 U
86. The variable overhead rate variance for November is:
A. $1,574 F
B. $1,440 U
C. $1,574 U
D. $1,440 F

Variable overhead rate variance = (AH × AR) - (AH × SR)
= $29,906 - (7,870 hour × $4 per hour)
= $29,906 - $31,480 = $1,574 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Medium

Caquias Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity or Hours</th>
<th>Standard Price or Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>3.5 kgs</td>
<td>$6.00 per kilo</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.5 hours</td>
<td>$10.00 per hour</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.5 hours</td>
<td>$4.00 per hour</td>
</tr>
</tbody>
</table>

The company reported the following results concerning this product in August.

<table>
<thead>
<tr>
<th>Actual output</th>
<th>2,000 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw materials used in production</td>
<td>10,900 kgs</td>
</tr>
<tr>
<td>Purchased raw materials</td>
<td>11,800 kgs</td>
</tr>
<tr>
<td>Actual direct labor-hours</td>
<td>1,100 hours</td>
</tr>
<tr>
<td>Actual cost of raw materials purchases</td>
<td>$70,160</td>
</tr>
<tr>
<td>Actual direct labor cost</td>
<td>$10,560</td>
</tr>
<tr>
<td>Actual variable overhead cost</td>
<td>$4,210</td>
</tr>
</tbody>
</table>

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.
87. The materials quantity variance for August is:

A. $1,620 F  
B. $1,674 F  
C. $1,620 U  
D. $1,674 U 

SQ = 2,100 units × 5.3 kilos = 11,130 kilos
Materials quantity variance = (AQ - SQ) SP
= (10,860 kilos - 11,130 kilos) $6.00 per kilo
= (-270 kilos) $6.00 per kilo = $1,620 F

AASCB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Easy

88. The materials price variance for August is:

A. $2,360 U  
B. $2,360 F  
C. $2,226 U  
D. $2,226 F 

Materials price variance = (AQ × AP) - (AQ × SP)
= $73,160 - (11,800 kilos × $6.00 per kilo)
= $73,160 - $70,800 = $2,360 U

AASCB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Easy
89. The labor efficiency variance for August is:
A. $480 F
B. $500 U
C. $500 F
D. $480 U

SH = 2,100 units × 0.5 hour per unit = 1,050 hours
Variable overhead efficiency variance = (AH - SH) SR
= (1,100 hours - 1,050 hours) $10.00 per hour
= (50 hours) $10.00 per hour = $500 U

90. The labor rate variance for August is:
A. $440 F
B. $440 U
C. $420 U
D. $420 F

Labor rate variance = (AH × AR) - (AH × SR)
= $10,560 - (1,100 hours × $10.00 per hour)
= $10,560 - $11,000 = $440 F
Chapter 10 - Standard Costs and Variances

91. The variable overhead efficiency variance for August is:
   A. $200 F
   B. $205 U
   C. $205 F
   D. $200 U

   \[ \text{SH} = 2,100 \times 0.5 \text{ hour per unit} = 1,050 \text{ hours} \]
   Variable overhead efficiency variance = \((\text{AH} - \text{SH}) \times \text{SR}\)
   \[ = (1,100 \text{ hours} - 1,050 \text{ hours}) \times 4.00 \text{ per hour} \]
   \[ = (50 \text{ hours}) \times 4.00 \text{ per hour} = $200 \text{ U} \]

92. The variable overhead rate variance for August is:
   A. $105 F
   B. $110 F
   C. $105 U
   D. $110 U

   Variable overhead rate variance = \((\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR})\)
   \[ = 4,510 - (1,100 \text{ hours} \times 4.00 \text{ per hour}) \]
   \[ = 4,510 - 4,400 = $110 \text{ U} \]
Sande Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity</th>
<th>Standard Price or Rate</th>
<th>Standard Cost Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>9.2 grams</td>
<td>$6.00 per gram</td>
<td>$55.30</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.5 hours</td>
<td>$20.00 per hour</td>
<td>$11.50</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.5 hours</td>
<td>$2.00 per hour</td>
<td>$1.00</td>
</tr>
</tbody>
</table>

In November the company's budgeted production was 2,900 units but the actual production was 3,000 units. The company used 27,670 grams of the direct material and 1,390 direct labor-hours to produce this output. During the month, the company purchased 31,700 grams of the direct material at a cost of $196,540. The actual direct labor cost was $29,607 and the actual variable overhead cost was $2,502.

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

93. The materials quantity variance for November is:
   A. $420 U
   B. $434 F
   C. $420 F
   D. $434 U

\[
\text{SQ} = 3,000 \text{ units} \times 9.2 \text{ grams per unit} = 27,600 \text{ grams}
\]

\[
\text{Materials quantity variance} = (AQ - SQ) \times SP
\]

\[
= (27,670 \text{ grams} - 27,600 \text{ grams}) \times $6.00 \text{ per gram}
\]

\[
= (70 \text{ grams}) \times $6.00 \text{ per gram} = $420 \text{ U}
\]

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Medium
Chapter 10 - Standard Costs and Variances

94. The materials price variance for November is:
A. $5,520 F
B. $6,340 F
C. $5,520 U
D. $6,340 U

Materials price variance = (AQ × AP) - (AQ × SP)
= $196,540 - (31,700 grams × $6.00 per gram)
= $196,540 - $190,200 = $6,340 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Medium

95. The labor efficiency variance for November is:
A. $2,530 U
B. $2,530 F
C. $2,343 F
D. $2,343 U

SH = 3,000 units × 0.5 hours per unit = 1,500 hours
Variable overhead efficiency variance = (AH - SH) SR
= (1,390 hours - 1,500 hours) $23.00 per hour
= (110 hours) $23.00 per hour = $2,530 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Level: Medium
96. The labor rate variance for November is:
A. $2,363 U
B. $2,550 F
C. $2,550 U
D. $2,363 F

Labor rate variance = (AH × AR) - (AH × SR)
= $29,607 - (1,390 hours × $23.00 per hour)
= $29,607 - $31,970 = $2,363 F

97. The variable overhead efficiency variance for November is:
A. $220 U
B. $198 F
C. $198 U
D. $220 F

SH = 3,000 units × 0.5 hours per unit = 1,500 hours
Variable overhead efficiency variance = (AH - SH) SR
= (1,390 hours - 1,500 hours) $2.00 per hour
= (-110 hours) $2.00 per hour = $220 F
98. The variable overhead rate variance for November is:
A. $300 U
B. $278 U
C. $300 F
D. $278 F

Variable overhead rate variance = (AH \times AR) - (AH \times SR)
= $2,502 - (1,390 \text{ hours} \times $2.00 \text{ per hour})
= $2,502 - $2,780 = $278 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Medium

Landram Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Input</th>
<th>Standard Quantity or Hours</th>
<th>Standard Price or Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>2.0 kilos</td>
<td>$7.00 per kilo</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.5 hours</td>
<td>$19.00 per hour</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.5 hours</td>
<td>$5.00 per hour</td>
</tr>
</tbody>
</table>

In March the company produced 4,700 units using 10,230 kilos of the direct material and 2,210 direct labor-hours. During the month, the company purchased 10,800 kilos of the direct material at a cost of $76,680. The actual direct labor cost was $38,233 and the actual variable overhead cost was $11,934.

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.
Chapter 10 - Standard Costs and Variances

99. The materials quantity variance for March is:
   A. $5,810 F
   B. $5,893 U
   C. $5,893 F
   D. $5,810 U

   SQ = 4,700 units \times 2.0 \text{ kilos per unit} = 9,400 \text{ kilos}
   Materials quantity variance = (AQ - SQ) SP
   = (10,230 \text{ kilos} - 9,400 \text{ kilos}) \times 7.00 \text{ per kilo}
   = (830 \text{ kilos}) \times 7.00 \text{ per kilo} = $5,810 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Easy

100. The materials price variance for March is:
   A. $940 F
   B. $1,080 F
   C. $1,080 U
   D. $940 U

   Materials price variance = (AQ \times AP) - (AQ \times SP)
   = $76,680 - (10,800 \text{ kilos} \times 7.00 \text{ per kilo})
   = $76,680 - $75,600 = $1,080 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Easy
Chapter 10 - Standard Costs and Variances

101. The labor efficiency variance for March is:
A. $2,660 F
B. $2,422 F
C. $2,422 U
D. $2,660 U

SH = 4,700 units × 0.5 hour per unit = 2,350 hours
Labor efficiency variance = (AH - SH) SR
= (2,210 hours - 2,350 hours) $19.00 per hour
= (-140 hours) $19.00 per hour = $2,660 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Level: Easy

102. The labor rate variance for March is:
A. $3,757 U
B. $3,757 F
C. $3,995 U
D. $3,995 F

Labor rate variance = (AH × AR) - (AH × SR)
= $38,233 - (2,210 hours × $19.00 per hour)
= $38,233 - $41,990 = $3,757 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Level: Easy
103. The variable overhead efficiency variance for March is:
A. $756 U
B. $700 F
C. $756 F
D. $700 U

SH = 4,700 units × 0.5 hour per unit = 2,350 hours
Variable overhead efficiency variance = (AH - SH) SR
= (2,210 hours - 2,350 hours) $5.00 per hour
= (-140 hours) $5.00 per hour = $700 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy

104. The variable overhead rate variance for March is:
A. $884 U
B. $884 F
C. $940 U
D. $940 F

Variable overhead rate variance = (AH × AR) - (AH × SR)
= $11,934 - (2,210 hours × $5.00 per hour)
= $11,934 - $11,050 = $884 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy
Chapter 10 - Standard Costs and Variances

Arrow Industries uses a standard cost system in which direct materials inventory is carried at standard cost. Arrow has established the following standards for the prime costs of one unit of product.

During May, Arrow purchased 160,000 pounds of direct material at a total cost of $304,000. The total direct labor wages for May were $37,800. Arrow manufactured 19,000 units of product during May using 142,500 pounds of direct material and 5,000 direct labor-hours.

105. The direct materials price variance for May is:
A. $16,000 favorable  
B. $16,000 unfavorable  
C. $14,250 favorable  
D. $14,250 unfavorable

Materials price variance = (AQ \times AP) - (AQ \times SP)
= $304,000 - (160,000 pounds \times $1.80 per pound)
= $304,000 - $288,000 = $16,000 U

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom’s: Application  
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Easy  
Source: CMA, adapted
106. The direct materials quantity variance for May is:
A. $14,400 unfavorable
B. $1,100 favorable
C. $17,100 unfavorable
D. $17,100 favorable

SQ = 19,000 units × 8 pounds per unit = 152,000 pounds
Materials quantity variance = (AQ - SQ) SP
= (142,500 pounds - 152,000 pounds) $1.80 per pound
= (-9,500 pounds) $1.80 per pound = $17,100 F

107. The direct labor rate variance for May is:
A. $2,200 favorable
B. $1,900 unfavorable
C. $2,000 unfavorable
D. $2,090 favorable

Labor rate variance = (AQ × AP) - (AQ × SP)
= $37,800 - (5,000 hours × $8.00 per hour)
= $37,800 - $40,000 = $2,200 F
108. The direct labor efficiency variance for May is:
A. $2,200 favorable  
B. $2,000 favorable  
C. $2,000 unfavorable  
D. $1,800 unfavorable  

SH = 19,000 units × 0.25 hour per unit = 4,750 hours  
Labor efficiency variance = (AH - SH) SR  
= (5,000 hours - 4,750 hours) $8 per hour  
= (250 hours) $8 per hour = $2,000 U

The Thompson Company uses standard costing and has established the following direct material and direct labor standards for each unit of Lept.
Direct materials: 2 gallons at $4 per gallon  
Direct labor: 0.5 hours at $8 per hour  
During September, the company made 6,000 Lepts and incurred the following costs:
Direct materials purchased: 13,400 gallons at $4.10 per gallon  
Direct materials used: 12,600 gallons  
Direct labor used: 2,800 hours at $7.65 per hour
109. The materials price variance for September was:
A. $1,340 favorable
B. $1,260 favorable
C. $1,260 unfavorable
D. $1,340 unfavorable

Materials price variance = AQ (AP - SP)
= 13,400 gallons ($4.10 per gallon - $4.00 per gallon)
= 13,400 gallons ($0.10 per gallon) = $1,340 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Easy

110. The materials quantity variance for September was:
A. $2,460 unfavorable
B. $5,600 unfavorable
C. $2,400 unfavorable
D. $5,740 unfavorable

SQ = 6,000 units x 2 gallons per units = 12,000 gallons
Materials quantity variance = (AQ - SQ) SP
= (12,600 gallons - 12,000 gallons) $4.00 per gallon
= (600 gallons) $4.00 per gallon = $2,400 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Easy
111. The labor rate variance for September was:
A. $1,530 unfavorable
B. $980 favorable
C. $280 favorable
D. $980 unfavorable

Labor rate variance = AH(AR - SR)
= 2,800 hours ($7.65 per hour - $8.00 per hour)
= 2,800 hours (-$0.35 per hour) = $980 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Level: Easy

112. The labor efficiency variance for September was:
A. $33,600 favorable
B. $1,600 favorable
C. $22,400 favorable
D. $3,200 favorable

SH = 6,000 units × 0.5 hours per unit = 3,000 hours
Labor efficiency variance = (AH - SH) SR
= (2,800 hours - 3,000 hours) $8.00 per hour
= (-200 hours) $8.00 per hour = $1,600 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Level: Easy
Chapter 10 - Standard Costs and Variances

The Geurtz Company uses standard costing. The company makes and sells a single product called a Roff. The following data are for the month of August:
- Actual cost of direct material purchased and used: $65,560
- Material price variance: $5,960 unfavorable
- Total materials variance: $22,360 unfavorable
- Standard cost per pound of material: $4
- Standard cost per direct labor-hour: $5
- Actual direct labor-hours: 6,500 hours
- Labor efficiency variance: $3,500 favorable
- Standard number of direct labor-hours per unit of Roff: 2 hours
- Total labor variance: $400 unfavorable

113. The total number of units of Roff produced during August was:

A. 10,800
B. 14,400
C. 3,600
D. 6,500

Labor efficiency variance = (AH \times SR) - (SH \times SR)
= (6,500 \text{ hours} \times $5 \text{ per hour}) - (2 \text{ hours per unit} \times \text{Actual units produced} \times $5 \text{ per hour}) = - $3,500
$32,500 - $10 \text{ per unit} \times \text{Actual units produced} = -$3,500
$10 \text{ per unit} \times \text{Actual units produced} = $36,000
Actual units produced = $36,000 ÷ $10 \text{ per unit} = 3,600 units

AASCB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Level: Hard
114. The standard material allowed to produce one unit of Roff was:
A. 1 pound
B. 4 pounds
C. 3 pounds
D. 2 pounds

The following analysis only works if, as in this case, the materials purchased during the period are also used during the period.
Total materials variance = Actual materials cost - Standard materials cost
$22,360 = $65,560 - Standard materials cost
Standard materials cost = $43,200
Standard materials cost = Standard cost per pound \( \times \) Standard pounds per unit \( \times \) Actual units produced
$43,200 = $4 per pound \( \times \) Standard pounds per unit \( \times \) 3,600 units*
Standard pounds per unit = $43,200 \( \div \) ($4 per pound \( \times \) 3,600 units) = 2 pounds per unit
*To compute the actual units produced:
Labor efficiency variance = (AH \( \times \) SR) - (SH \( \times \) SR)
= (6,500 hours \( \times \) $5 per hour) - (2 hours per unit \( \times \) Actual units produced \( \times \) $5 per hour) = - $3,500
$32,500 - $10 per unit \( \times \) Actual units produced = -$3,500
$10 per unit \( \times \) Actual units produced = $36,000
Actual units produced = $36,000 \( \div \) $10 per unit = 3,600 units

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Hard
115. The actual material cost per pound was:
A. $4.00
B. $3.67
C. $3.30
D. $4.40

Total material variance = Material price variance + Material quantity variance
$22,360 U = $5,960 U + Material quantity variance
Material quantity variance = $22,360 U - $5,960 U
Material quantity variance = $16,400 U
Material quantity variance = SP (AQ - SQ)
$16,400 = $4 per pound (AQ - (3,600 units × 3 pounds per unit))
$16,400 = $4 per pound × AQ - $43,200
$59,600 = $4 per pound × AQ
AQ = $59,600 ÷ $4 per pound
AQ = 14,900 pounds
Actual cost of materials = Actual price per pound × AQ
$65,560 = Actual price per pound × 14,900 pounds
Actual price per pound = $65,560 ÷ 14,900 pounds = $4.40 per pound
116. The actual direct labor rate per hour was:
A. $5.60  
B. $5.00  
C. $10.00  
D. $4.40

Total labor variance = Labor rate variance + Labor efficiency variance
$400 U = Labor rate variance + $3,500 F
Labor rate variance = $3,900 U
Labor rate variance = (AH × AR) - (AH × SR) = AH (AR - SR)
$3,900 = 6,500 hours (AR - $5 per hour)
$3,900 = 6,500 hours × AR - $32,500
6,500 hours × AR = $36,400
AR = $36,400 ÷ 6,500 hours = $5.60 per hour

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance  
Level: Hard

117. The labor rate variance was:
A. $3,900 favorable  
B. $3,900 unfavorable  
C. $3,100 unfavorable  
D. $3,100 favorable

Total labor variance = Labor rate variance + Labor efficiency variance
$400 U = Labor rate variance + $3,500 F
Labor rate variance = $3,900 U

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance  
Level: Medium
Chapter 10 - Standard Costs and Variances

The following materials standards have been established for a particular product:

<table>
<thead>
<tr>
<th>Standard quantity per unit of output</th>
<th>4.6 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard price per feet</td>
<td>$19.40</td>
</tr>
</tbody>
</table>

The following data pertain to operations concerning the product for the last month:

<table>
<thead>
<tr>
<th>Actual materials purchased</th>
<th>1,100 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual cost of materials purchased</td>
<td>$20,680</td>
</tr>
<tr>
<td>Actual materials used in production</td>
<td>1,000 feet</td>
</tr>
<tr>
<td>Actual output</td>
<td>100 units</td>
</tr>
</tbody>
</table>

118. What is the materials price variance for the month?
A. $660 U  
B. $600 U  
C. $660 F  
D. $600 F

Materials price variance = (AQ × AP) - (AQ × SP)
= $20,680 - (1,100 feet × $19.40 per foot)
= $20,680 - $21,340 = $660 F

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application  
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance  
Level: Easy

119. What is the materials quantity variance for the month?
A. $1,880 U  
B. $10,476 U  
C. $1,940 U  
D. $10,152 U

SQ = 100 units × 4.6 feet per unit = 460 feet  
Materials quantity variance = (AQ - SQ) SP
= (1,000 feet - 460 feet) $19.40 per foot
= (540 feet) $19.40 per foot = $10,476 U

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application  
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance  
Level: Easy
Johnny Corporation makes a product that uses a material with the following standards:

<table>
<thead>
<tr>
<th>Standard quantity</th>
<th>8.2 kilos per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard price</td>
<td>$1.00 per kilo</td>
</tr>
<tr>
<td>Standard cost</td>
<td>$8.20 per unit</td>
</tr>
</tbody>
</table>

The company budgeted for production of 9,500 units in April, but actual production was 9,600 units. The company used 85,400 kilos of direct material to produce this output. The company purchased 91,900 kilos of the direct material at $1.10 per kilo.

The direct materials purchases variance is computed when the materials are purchased.

120. The materials quantity variance for April is:

A. $7,348 U  
B. $6,680 U  
C. $6,680 F  
D. $7,348 F

SQ = 9,600 units × 8.2 kilos per unit = 78,720 kilos

Materials quantity variance = (AQ - SQ) SP
= (85,400 kilos - 78,720 kilos) $1.00 per kilo
= (6,680 kilos) $1.00 per kilo = $6,680 U

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom’s: Application  
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance  
Level: Medium
121. The materials price variance for April is:
A. $7,872 F
B. $9,190 U
C. $9,190 F
D. $7,872 U

Materials price variance = AQ (AP - SP)
= 91,900 kilos ($1.10 per kilo - $1.00 per kilo)
= 91,900 kilos ($0.10 per kilo) = $9,190 U

Fraize Corporation makes a product that uses a material with the quantity standard of 9.5 kilos per unit of output and the price standard of $4.00 per kilo. In July the company produced 7,000 units using 68,850 kilos of the direct material. During the month the company purchased 73,600 kilos of the direct material at $3.70 per kilo. The direct materials purchases variance is computed when the materials are purchased.

122. The materials quantity variance for July is:
A. $9,400 U
B. $8,695 U
C. $9,400 F
D. $8,695 F

SQ = 7,000 units × 9.5 kilos per unit = 66,500 kilos
Materials quantity variance = (AQ - SQ) SP
= (68,850 kilos - 66,500 kilos) $4.00 per kilo
= (2,350 kilos) $4.00 per kilo = $9,400 U
123. The materials price variance for July is:
A. $22,080 U  
B. $19,950 U  
C. $22,080 F  
D. $19,950 F

Materials price variance = AQ (AP - SP)
= 73,600 kilos ($3.70 per kilo - $4.00 per kilo)
= 73,600 kilos (-$0.30 per kilo) = $22,080 F

Cuda Corporation makes a product that uses a material with the following standards:

<table>
<thead>
<tr>
<th>Standard quantity</th>
<th>0.5 pounds per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard price</td>
<td>$6.00 per pound</td>
</tr>
<tr>
<td>Standard cost</td>
<td>$3.00 per unit</td>
</tr>
</tbody>
</table>

The company budgeted for production of 3,500 units in November, but actual production was 3,300 units. The company used 23,050 pounds of direct material to produce this output. The company purchased 26,000 pounds of the direct material at a total cost of $158,600. The direct materials purchases variance is computed when the materials are purchased.
124. The materials quantity variance for November is:
   A. $9,600 U  
   B. $9,760 U  
   C. $9,760 F  
   D. $9,600 F

SQ = 3,300 units × 6.5 pounds per unit = 21,450 pounds
Materials quantity variance = (AQ - SQ) SP
= (23,050 pounds - 21,450 pounds) $6.00 per pound
= (1,600 pounds) $6.00 per pound = $9,600 U

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application  
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance  
Level: Medium

125. The materials price variance for November is:
   A. $2,145 U  
   B. $2,145 F  
   C. $2,600 U  
   D. $2,600 F

Materials price variance = (AQ × AP) - (AQ × SP)
= $158,600 - (26,000 pounds × $6.00 per pound)
= $158,600 - $156,000 = $2,600 U

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application  
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance  
Level: Medium
Carskadon Corporation makes a product that uses a material with the following direct material standards:

<table>
<thead>
<tr>
<th>Standard quantity</th>
<th>2.2 pounds per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard price</td>
<td>$2.00 per pound</td>
</tr>
</tbody>
</table>

The company produced 3,000 units in December using 6,270 pounds of the material. During the month, the company purchased 7,100 pounds of the direct material at a total cost of $13,490. The direct materials purchases variance is computed when the materials are purchased.

126. The materials quantity variance for December is:

A. $660 F  
B. $660 U  
C. $627 F  
D. $627 U

\[
\text{SQ} = 3,000 \text{ units} \times 2.2 \text{ pounds per unit} = 6,600 \text{ pounds}
\]

\[
\text{Materials quantity variance} = (AQ - SQ) SP
\]

\[
= (6,270 \text{ pounds} - 6,600 \text{ pounds}) \times \$2.00 \text{ per pound}
\]

\[
= (-330 \text{ pounds}) \times \$2.00 \text{ per pound} = $660 \text{ F}
\]

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Level: Medium
127. The materials price variance for December is:

A. $710 F
B. $710 U
C. $660 F
D. $660 U

Materials price variance = (AQ \times AP) - (AQ \times SP)
= $13,490 - (7,100 \text{ pounds} \times $2.00 \text{ per pound})
= $13,490 - $14,200 = $710 F

The auto repair shop of Empire Motor Sales uses standards to control labor time and labor cost in the shop. The standard time for a motor tune-up is 2.5 hours. The record showing time spent in the shop last week on tune-ups has been misplaced; however, the shop supervisor recalls that 50 tune-ups were completed during the week and the controller recalls that the labor rate variance on tune-ups was $87, favorable. The shop has a set standard labor rate of $9 per hour for tune-up work. The total labor variance for the week on tune-up work was $93, unfavorable.
128. The number of actual hours spent on tune-up work last week was:
A. 125 hours  
B. 105 hours  
C. 145 hours  
D. Cannot be computed without further information

Total labor variance = Labor rate variance + Labor efficiency variance
$93 U = $87 F + Labor efficiency variance
$93 = -$87 + Labor efficiency variance
Labor efficiency variance = $180
Labor efficiency variance = (AH × SR) - (SH × SR) = (AH - SH) SR
$180 = (AH - (2.5 hours per tune-up × 50 tune-ups)) $9 per hour
$180 = $9 per hour × AH - $1,125
$9 per hour × AH = $1,305
AH = $1,305 ÷ $9 per hour = 145 hours

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application  
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance  
Level: Hard

129. The actual hourly rate of pay for tune-up work last week was:
A. $8.40 per hour  
B. $9.00 per hour  
C. $9.60 per hour  
D. Cannot be computed without further information

Labor rate variance = AH (AR - SR)
-$87 = 145 hours (AR - $9 per hour)
-$87 = 145 hours × AR - $1,305
145 hours × AR = $1,218
AR = $1,218 ÷ 145 hours = $8.40 per hour

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application  
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance  
Level: Hard
Chapter 10 - Standard Costs and Variances

The following labor standards have been established for a particular product:

<table>
<thead>
<tr>
<th>Standard labor-hours per unit of output</th>
<th>5.4 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard labor rate</td>
<td>$10.20 per hour</td>
</tr>
</tbody>
</table>

The following data pertain to operations concerning the product for the last month:

<table>
<thead>
<tr>
<th>Actual hours worked</th>
<th>1,000 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual total labor cost</td>
<td>$10,600</td>
</tr>
<tr>
<td>Actual output</td>
<td>200 units</td>
</tr>
</tbody>
</table>

130. What is the labor rate variance for the month?
A. $400 F
B. $80 U
C. $80 F
D. $400 U

Labor rate variance = (AH × AR) - (AH × SR)
= $10,600 - (1,000 hours × $10.20 per hour)
= $10,600 - $10,200 = $400 U

131. What is the labor efficiency variance for the month?
A. $416 F
B. $416 U
C. $816 F
D. $848 F

SH = 200 units × 5.4 hours per unit = 1,080 hours
Labor efficiency variance = (AH - SH) SR
= (1,000 hours - 1,080 hours) $10.20 per hour
= (-80 hours) $10.20 per hour = $816 F
Bonnot Corporation makes a product that has the following direct labor standards:

<table>
<thead>
<tr>
<th>Standard direct labor-hours</th>
<th>6.2</th>
<th>hours per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard direct labor rate</td>
<td>$1.00</td>
<td>per hour</td>
</tr>
<tr>
<td>Standard cost</td>
<td>$4.20</td>
<td>per unit</td>
</tr>
</tbody>
</table>

The company budgeted for production of 2,100 units in October, but actual production was 1,900 units. The company used 410 direct labor-hours to produce this output. The actual direct labor rate was $20.60 per hour.

132. The labor efficiency variance for October is:
A. $618 U  
B. $630 F  
C. $618 F  
D. $630 U

\[ \text{Labor efficiency variance} = (\text{AH} - \text{SH}) \times \text{SR} \]
\[ = (410 \text{ hours} - 380 \text{ hours}) \times \$21.00 \text{ per hour} \]
\[ = 30 \text{ hours} \times \$21.00 \text{ per hour} = $630 \text{ U} \]

133. The labor rate variance for October is:
A. $164 F  
B. $164 U  
C. $152 U  
D. $152 F

\[ \text{Labor rate variance} = \text{AH} \times (\text{AR} - \text{SR}) \]
\[ = 410 \text{ hours} \times ($20.60 \text{ per hour} - $21.00 \text{ per hour}) \]
\[ = 410 \text{ hours} \times (-$0.40 \text{ per hour}) = $164 \text{ F} \]
Davidson Corporation makes a product that has the following direct labor standards:

<table>
<thead>
<tr>
<th>Standard direct labor-hours</th>
<th>4.5 hours per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard direct labor rate</td>
<td>$23.00 per hour</td>
</tr>
</tbody>
</table>

In September the company produced 4,900 units using 2,210 direct labor-hours. The actual direct labor rate was $22.40 per hour.

134. The labor efficiency variance for September is:

A. $5,520 F
B. $5,376 F
C. $5,520 U
D. $5,376 U

\[ SH = 4,900 \text{ units} \times 0.5 \text{ hours per unit} = 2,450 \text{ hours} \]

Labor efficiency variance = (AH - SH) SR

\[ = (2,210 \text{ hours} - 2,450 \text{ hours}) \times $23.00 \text{ per hour} \]

\[ = (-240 \text{ hours}) \times $23.00 \text{ per hour} = $5,520 \text{ F} \]

135. The labor rate variance for September is:

A. $1,470 U
B. $1,326 U
C. $1,326 F
D. $1,470 F

Labor rate variance = AH(AR - SR)

\[ = 2,210 \text{ hours} \times ($22.40 \text{ per hour} - $23.00 \text{ per hour}) \]

\[ = 2,210 \text{ hours} \times (-0.60 \text{ per hour}) = $1,326 \text{ F} \]
Chapter 10 - Standard Costs and Variances

Pikus Corporation makes a product that has the following direct labor standards:

<table>
<thead>
<tr>
<th>Standard direct labor-hours</th>
<th>0.2 hours per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard direct labor rate</td>
<td>$15.00 per hour</td>
</tr>
</tbody>
</table>

In January the company's budgeted production was 3,400 units, but the actual production was 3,500 units. The company used 640 direct labor-hours to produce this output. The actual direct labor cost was $8,960.

136. The labor efficiency variance for January is:
A. $840 U  
B. $900 U  
C. $840 F  
D. $900 F

\[ SH = 3,500 \text{ units} \times 0.2 \text{ hours per unit} = 700 \text{ hours} \]

\[ \text{Labor efficiency variance} = (AH - SH) \times SR \]
\[ = (640 \text{ hours} - 700 \text{ hours}) \times $15.00 \text{ per hour} \]
\[ = (-60 \text{ hours}) \times $15.00 \text{ per hour} = $900 \text{ F} \]

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application  
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance  
Level: Medium

137. The labor rate variance for January is:
A. $700 F  
B. $640 U  
C. $640 F  
D. $700 U

\[ \text{Labor rate variance} = (AQ \times AP) - (AQ \times SP) \]
\[ = $8,960 - (640 \text{ hours} \times $15.00 \text{ per hour}) \]
\[ = $8,960 - $9,600 = $640 \text{ F} \]

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom's: Application  
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance  
Level: Medium
Fabiano Corporation makes a product whose direct labor standards are 0.5 hours per unit and $23.00 per hour. In February the company produced 3,300 units using 1,640 direct labor-hours. The actual direct labor cost was $38,540.

138. The labor efficiency variance for February is:
A. $230 F  
B. $235 F  
C. $230 U  
D. $235 U  

SH = 3,300 units \times 0.5 \text{ hours per unit} = 1,650 \text{ hours}  
Labor efficiency variance = (AH - SH) SR 
= (1,640 \text{ hours} - 1,650 \text{ hours}) \times $23.00 \text{ per hour}  
= (-10 \text{ hours}) \times $23.00 \text{ per hour} = $230 F

139. The labor rate variance for February is:
A. $825 U  
B. $820 U  
C. $820 F  
D. $825 F  

Labor rate variance = (AQ \times AP) - (AQ \times SP) 
= $38,540 - (1,640 \text{ hours} \times $23.00 \text{ per hour})  
= $38,540 - $37,720  
= $820 U
Chapter 10 - Standard Costs and Variances

The following standards for variable manufacturing overhead have been established for a company that makes only one product:

<table>
<thead>
<tr>
<th>Standard hours per unit of output</th>
<th>4.2 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard variable overhead rate</td>
<td>$11.50 per hour</td>
</tr>
</tbody>
</table>

The following data pertain to operations for the last month:

<table>
<thead>
<tr>
<th>Actual hours</th>
<th>8,600 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual total variable manufacturing overhead cost</td>
<td>$95,890</td>
</tr>
<tr>
<td>Actual output</td>
<td>1,900 units</td>
</tr>
</tbody>
</table>

140. What is the variable overhead rate variance for the month?
A. $3,721 F
B. $3,721 U
C. $3,440 F
D. $3,440 U

Variable overhead rate variance = (AH × AR) - (AH × SR)
= $95,890 - (8,600 actual hours × $11.55 per hour)
= $95,890 - $99,330 = $3,440 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy

141. What is the variable overhead efficiency variance for the month?
A. $3,192 U
B. $6,913 F
C. $7,161 U
D. $6,913 U

SH = 1,900 units × 4.2 hours per unit = 7,980 hours
Variable overhead efficiency variance = (AH - SH) SR
= (8,600 hours - 7,980 hours) $11.55 per hour
= (620 hours) $11.55 per hour = $7,161 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy
The Richie Company uses a standard costing system in which variable manufacturing overhead is assigned to production on the basis of the number of machine setups. Data for the month of October include the following:

- Variable manufacturing overhead cost incurred: $42,750
- Total variable manufacturing overhead variance: $5,430 favorable
- Standard machine setups allowed for actual production: 2,920 setups
- Actual machine setups incurred: 2,850 setups

142. The standard variable overhead rate per machine setup is:
A. $16.91
B. $12.78
C. $15.00
D. $16.50

Total variable manufacturing overhead variance = Actual manufacturing overhead cost incurred - Standard manufacturing overhead cost
$5,430 F = $42,750 - Standard manufacturing overhead cost
-$5,430 = $42,750 - Standard manufacturing overhead cost
Standard manufacturing overhead cost = $48,180
$48,180 ÷ 2,920 setups = $16.50 per setup

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Hard
143. The variable overhead rate variance is:
A. $4,275 favorable
B. $4,275 unfavorable
C. $1,050 unfavorable
D. $1,050 favorable

Variable overhead rate variance = (AH \times AR) - (AH \times SR)
$42,750 - (2,850 setups \times $16.50 per setup)
= $42,750 - $47,025 = $4,275 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Hard

A manufacturing company that has only one product has established the following standards for its variable manufacturing overhead. The company bases its variable manufacturing overhead standards on machine-hours.

<table>
<thead>
<tr>
<th>Standard hours per unit of output</th>
<th>4.6</th>
<th>machine-hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard variable overhead rate</td>
<td>$12.25</td>
<td>per machine-hour</td>
</tr>
</tbody>
</table>

The following data pertain to operations for the last month:

<table>
<thead>
<tr>
<th>Actual hours</th>
<th>6,100 machine-hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual total variable manufacturing overhead cost</td>
<td>$73,505</td>
</tr>
<tr>
<td>Actual output</td>
<td>1,200 units</td>
</tr>
</tbody>
</table>

144. What is the variable overhead rate variance for the month?
A. $1,220 U
B. $5,885 F
C. $1,220 F
D. $5,885 U

Variable overhead rate variance = (AH \times AR) - (AH \times SR)
= $73,505 - (6,100 machine-hours \times $12.25 per machine-hour)
= $73,505 - $74,725 = $1,220 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Medium
145. What is the variable overhead efficiency variance for the month?

A. $7,105 U  
B. $6,989 F  
C. $6,989 U  
D. $1,104 U

SH = 1,200 units × 4.6 hours per unit = 5,520 hours  
Variable overhead efficiency variance = (AH - SH) SR  
= (6,100 hours - 5,520 hours) $12.25 per hour  
= (580 hours) $12.25 per hour = $7,105 U

**AACSB: Analytic**  
**AICPA BB: Critical Thinking**  
**AICPA FN: Measurement**  
**Bloom's: Application**  
**Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance**  
**Level: Medium**

The following data have been provided by Augustave Corporation:

<table>
<thead>
<tr>
<th></th>
<th>6,500 motors</th>
<th>6,9 machine-hours</th>
<th>4.50 per machine-hour</th>
<th>2.10 per machine-hour</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Budgeted production</strong></td>
<td>6,500 motors</td>
<td>6,9 machine-hours</td>
<td>4.50 per machine-hour</td>
<td>2.10 per machine-hour</td>
</tr>
<tr>
<td><strong>Standard indirect labor rate</strong></td>
<td>4.50 per machine-hour</td>
<td>6,9 machine-hours</td>
<td>4.50 per machine-hour</td>
<td>2.10 per machine-hour</td>
</tr>
<tr>
<td><strong>Standard power rate</strong></td>
<td>2.10 per machine-hour</td>
<td>6,9 machine-hours</td>
<td>4.50 per machine-hour</td>
<td>2.10 per machine-hour</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>6,500 motors</th>
<th>44,170 machine-hours</th>
<th>194,418</th>
<th>89,169 machine-hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actual production</strong></td>
<td>6,500 motors</td>
<td>44,170 machine-hours</td>
<td>194,418</td>
<td>89,169 machine-hours</td>
</tr>
<tr>
<td><strong>Actual machine-hours (total)</strong></td>
<td>44,170 machine-hours</td>
<td>6,500 motors</td>
<td>44,170 machine-hours</td>
<td>194,418</td>
</tr>
<tr>
<td><strong>Actual indirect labor (total)</strong></td>
<td>194,418</td>
<td>6,500 motors</td>
<td>44,170 machine-hours</td>
<td>194,418</td>
</tr>
<tr>
<td><strong>Actual power (total)</strong></td>
<td>89,169 machine-hours</td>
<td>6,500 motors</td>
<td>44,170 machine-hours</td>
<td>194,418</td>
</tr>
</tbody>
</table>

Indirect labor and power are both elements of variable manufacturing overhead.
146. The variable overhead rate variance for indirect labor is closest to:

A. $7,407 F  
B. $4,347 F  
C. $4,347 U  
D. $3,060 F

Variable overhead rate variance = (AH × AR) - (AH × SR)
= $194,418 - (44,170 hours × $4.50 per hour)
= $194,418 - $198,765 = $4,347 F

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom’s: Application  
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance  
Level: Medium

147. The variable overhead rate variance for power is closest to:

A. $1,428 F  
B. $5,016 F  
C. $5,016 U  
D. $3,588 F

Variable overhead rate variance = (AH × AR) - (AH × SR)
= $89,169 - (44,170 hours × $2.10 per hour)
= $89,169 - $92,757 = $3,588 F

AACSB: Analytic  
AICPA BB: Critical Thinking  
AICPA FN: Measurement  
Bloom’s: Application  
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance  
Level: Medium

The following data have been provided by Pollo Corporation:

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
<th>per machine-hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted production</td>
<td>2,200</td>
<td></td>
</tr>
<tr>
<td>Standard machine-hours per unit</td>
<td>7.3</td>
<td></td>
</tr>
<tr>
<td>Standard lubricants rate</td>
<td>$2.50</td>
<td></td>
</tr>
<tr>
<td>Standard supplies rate</td>
<td>$0.20</td>
<td></td>
</tr>
<tr>
<td>Actual production</td>
<td>8,500</td>
<td></td>
</tr>
<tr>
<td>Actual machine-hours (total)</td>
<td>64,160</td>
<td></td>
</tr>
<tr>
<td>Actual lubricants (total)</td>
<td>$64,923</td>
<td></td>
</tr>
<tr>
<td>Actual supplies (total)</td>
<td>$75,465</td>
<td></td>
</tr>
</tbody>
</table>

Lubricants and supplies are both elements of variable manufacturing overhead.
148. The variable overhead rate variance for lubricants is closest to:
A. $1,425 U
B. $13,448 U
C. $12,023 U
D. $12,023 F

Variable overhead rate variance = (AH \times AR) - (AH \times SR)
= $164,923 - (61,160 \text{ hours} \times $2.50 \text{ per hour})
= $164,923 - $152,900 = $12,023 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy

149. The variable overhead rate variance for supplies is closest to:
A. $2,757 U
B. $2,757 F
C. $2,073 U
D. $684 U

Variable overhead rate variance = (AH \times AR) - (AH \times SR)
= $75,465 - (61,160 \text{ hours} \times $1.20 \text{ per hour})
= $75,465 - $73,392 = $2,073 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy
Hickory Corporation, which produces commercial safes, has provided the following data:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted production</td>
<td>9,800 safes</td>
</tr>
<tr>
<td>Standard machine-hours per safe</td>
<td>9.8 machine-hours</td>
</tr>
<tr>
<td>Standard supplies cost</td>
<td>$5.00 per machine-hour</td>
</tr>
<tr>
<td>Actual production</td>
<td>10,100 safes</td>
</tr>
<tr>
<td>Actual machine-hours</td>
<td>99,850 machine-hours</td>
</tr>
<tr>
<td>Actual supplies cost</td>
<td>$542,151</td>
</tr>
</tbody>
</table>

Supplies cost is an element of variable manufacturing overhead.
150. The variable overhead rate variance for supplies is closest to:
A. $47,251 F
B. $42,901 U
C. $47,251 U
D. $42,901 F

Variable overhead rate variance = (AH \times AR) - (AH \times SR)
= $542,151 - (99,850 \times $5.00) per hour
= $542,151 - $499,250 = $42,901 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy

151. The variable overhead efficiency variance for supplies is closest to:
A. $47,251 U
B. $4,350 U
C. $4,350 F
D. $47,251 F

SH = 10,100 units \times 9.8 hours per unit = 98,980 hours
Variable overhead efficiency variance = (AH - SH) SR
= (99,850 hours - 98,980 hours) $5.00 per hour
= (870 hours) $5.00 per hour = $4,350 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy
Jardell Corporation makes a product with the following standards for labor and variable overhead:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity</th>
<th>Standard Price</th>
<th>Standard Cost Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor</td>
<td>0.5 hours</td>
<td>$20.00 per hour</td>
<td>$10.00</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.5 hours</td>
<td>$5.00 per hour</td>
<td>$2.50</td>
</tr>
</tbody>
</table>

The company budgeted for production of 6,400 units in June, but actual production was 6,400 units. The company used 3,180 direct labor-hours to produce this output. The actual variable overhead rate was $4.90 per hour. The company applies variable overhead on the basis of direct labor-hours.

152. The variable overhead efficiency variance for June is:

A. $100 F  
B. $98 F  
C. $100 U  
D. $98 U

\[
SH = 6,400 \text{ units} \times 0.5 \text{ hours per unit} = 3,200 \text{ hours}
\]

Variable overhead efficiency variance = (AH - SH) SR
\[
= (3,180 \text{ hours} - 3,200 \text{ hours}) \times $5.00 \text{ per hour}
= (-20 \text{ hours}) \times $5.00 \text{ per hour} = $100 \text{ F}
\]
Chapter 10 - Standard Costs and Variances

153. The variable overhead rate variance for June is:
A. $318 U
B. $320 F
C. $318 F
D. $320 U

Variable overhead rate variance = AH(AR - SR)
= 3,180 hours ($4.90 per hour - $5.00 per hour)
= 3,180 hours (-$0.10 per hour) = $318 F

Schuetz Corporation makes a product whose variable overhead standards are based on direct labor-hours. The quantity standard is 0.4 hours per unit. The variable overhead rate standard is $5.00 per hour. In July the company produced 7,500 units using 2,740 direct labor-hours. The actual variable overhead rate was $5.20 per hour.

154. The variable overhead efficiency variance for July is:
A. $1,352 U
B. $1,352 F
C. $1,300 U
D. $1,300 F

SH = 7,500 units × 0.4 hours = 3,000 hours
Variable overhead efficiency variance = (AH - SH) SR
= (2,740 hours - 3,000 hours) $5.00 per hour
= (-260 hours) $5.00 per hour = $1,300 F
The variable overhead rate variance for July is:
A. $600 F
B. $600 U
C. $548 F
D. $548 U

Variable overhead rate variance = AH(AR - SR)
= 2,740 hours ($5.20 per hour - $5.00 per hour)
= 2,740 hours ($0.20 per hour) = $548 U

Mazzo Corporation makes a product with the following standards for direct labor and variable overhead:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity</th>
<th>Standard Price or Rate</th>
<th>Standard Cost per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor</td>
<td>0.4 hours</td>
<td>$10.00 per hour</td>
<td>$4.00</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.4 hours</td>
<td>$3.00 per hour</td>
<td>$1.20</td>
</tr>
</tbody>
</table>

In February the company’s budgeted production was 5,000 units, but the actual production was 5,100 units. The company used 2,090 direct labor-hours to produce this output. The actual variable overhead cost was $6,688. The company applies variable overhead on the basis of direct labor-hours.
156. The variable overhead efficiency variance for February is:
A. $150 F
B. $160 F
C. $160 U
D. $150 U

SH = 5,100 units × 0.4 hours = 2,040 hours
Variable overhead efficiency variance = (AH - SH) SR
= (2,090 hours - 2,040 hours) $3.00 per hour
= (50 hours) $3.00 per hour = $150 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Medium

157. The variable overhead rate variance for February is:
A. $408 U
B. $418 F
C. $418 U
D. $408 F

Variable overhead rate variance = (AH × AR) - (AH × SR)
= $6,688 - (2,090 hours × $3.00 per hour)
= $6,688 - $6,270 = $418 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Medium

10-162
Chapter 10 - Standard Costs and Variances

Marten Corporation makes a product with the following standards for direct labor and variable overhead:

<table>
<thead>
<tr>
<th>Input</th>
<th>Standard Quantity or Hours</th>
<th>Standard Price or Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor</td>
<td>0.1 hours</td>
<td>$10.00 per hour</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.1 hours</td>
<td>$5.00 per hour</td>
</tr>
</tbody>
</table>

In May the company produced 2,800 units using 300 direct labor-hours. The actual variable overhead cost was $1,620. The company applies variable overhead on the basis of direct labor-hours.

158. The variable overhead efficiency variance for May is:
A. $100 U
B. $108 F
C. $108 U
D. $100 F

\[
SH = 2,800 \text{ units} \times 0.1 \text{ hours per unit} = 280 \text{ hours}
\]

Variable overhead efficiency variance = \((AH - SH) \times SR = (300 \text{ hours} - 280 \text{ hours}) \times $5.00 \text{ per hour} = (20 \text{ hours}) \times $5.00 \text{ per hour} = $100 \text{ U}\]

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Medium
Chapter 10 - Standard Costs and Variances

159. The variable overhead rate variance for May is:
A. $112 U
B. $112 F
C. $120 F
D. $120 U

Variable overhead rate variance = (AH × AR) - (AH × SR)
= $1,620 - (300 hours × $5.00 per hour)
= $1,620 - $1,500 = $120 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Medium

Essay Questions
160. Thompson Company uses a standard cost system for its single product. The following data are available:

Actual experience for the current year:

<table>
<thead>
<tr>
<th>Purchases of raw materials (15,000 yards at $13.00 per yard)</th>
<th>$195,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw materials used</td>
<td>12,000 yards</td>
</tr>
<tr>
<td>Direct labor costs (10,200 hours at $10.00 per hour)</td>
<td>$102,000</td>
</tr>
<tr>
<td>Actual variable overhead cost</td>
<td>$84,150</td>
</tr>
<tr>
<td>Units produced</td>
<td>12,600 units</td>
</tr>
</tbody>
</table>

Standards per unit of product:

| Raw materials | 1.1 yards at $5.00 per yard |
| Direct labor  | 0.8 hours at $9.50 per hour  |

Required:

Compute the following variances for raw materials, direct labor, and variable overhead, assuming that the price variance for materials is recognized at point of purchase:

a. Direct materials price variance.
b. Direct materials quantity variance.
c. Direct labor rate variance.
d. Direct labor efficiency variance.
e. Variable overhead rate variance.
f. Variable overhead efficiency variance.

a. & b. Raw Materials:

Materials price variance = AQ (AP - SP)
= 15,000 yards ($13.00 per yard - $15.00 per yard)
= 15,000 yards (-$2.00 per yard) = $30,000 F

SQ = 12,600 units × 1.1 yards per unit = 13,860 yards

Materials quantity variance = (AQ - SQ) SP
= (12,000 yards - 13,860 yards) $15.00 per yard
= (-1,860 yards) $15.00 per yard = $27,900 F

c. & d. Direct Labor:

Labor rate variance = AH(AR - SR)
= 10,200 hours ($10.00 per hour - $9.50 per hour)
= 10,200 hours ($0.50 per hour) = $5,100 U

SH = 12,600 units × 0.8 hour per unit = 10,080 hours

Labor efficiency variance = (AH - SH) SR
= (10,200 hours - 10,080 hours) $9.50 per hour
= (120 hours) $9.50 per hour = $1,140 U

e. & f. Variable Overhead:

Variable overhead rate variance = (AH × AR) - (AH × SR)
= $84,150 - (10,200 hours × $8 per hour)
= $84,150 - $81,600 = $2,550 U

SH = 12,600 units × 0.8 hours per unit = 10,080 hours

Variable overhead efficiency variance = (AH - SH) SR
= (10,200 hours - 10,080 hours) $8.00 per hour
= (20 hours) $8.00 per hour = $960 U
Chapter 10 - Standard Costs and Variances

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Medium
161. Fastic Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity or Rate</th>
<th>Standard Price or Rate</th>
<th>Standard Cost Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>6.9 liters</td>
<td>$5.00 per liter</td>
<td>$34.50</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.3 hours</td>
<td>$17.00 per hour</td>
<td>$5.10</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.3 hours</td>
<td>$6.00 per hour</td>
<td>$1.80</td>
</tr>
</tbody>
</table>

The company reported the following results concerning this product in August.

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Originally budgeted output</td>
<td>8,400 units</td>
</tr>
<tr>
<td>Actual output</td>
<td>8,400 units</td>
</tr>
<tr>
<td>Raw materials used in production</td>
<td>6,500 liters</td>
</tr>
<tr>
<td>Actual direct labor-hours</td>
<td>2,310 hours</td>
</tr>
<tr>
<td>Actual price of raw materials</td>
<td>$4.90 per liter</td>
</tr>
<tr>
<td>Actual direct labor rate</td>
<td>$17.10 per hour</td>
</tr>
<tr>
<td>Actual variable overhead rate</td>
<td>$5.50 per hour</td>
</tr>
</tbody>
</table>

The materials price variance is recognized when materials are purchased. Variable overhead is applied on the basis of direct labor-hours.

Required:

a. Compute the materials quantity variance.

```
b. Compute the materials price variance.

c. Compute the labor efficiency variance.

d. Compute the direct labor rate variance.

e. Compute the variable overhead efficiency variance.

f. Compute the variable overhead rate variance.
```

a. SQ = 8,400 units × 6.9 liters per unit = 57,960 liters
Materials quantity variance = (AQ - SQ) SP
= (58,330 liters - 57,960 liters) $5.00 per liter
= (370 liters) $5.00 per liter = $1,850 U

b. Materials price variance = AQ (AP - SP)
= 62,500 liters ($4.90 per liter - $5.00 per liter)
= 62,500 liters ($0.10 per liter) = $6,250 F

c. SH = 8,400 units × 0.3 hours = 2,520 hours
Labor efficiency variance = (AH - SH) SR
= (2,310 hours - 2,520 hours) $17.00 per hour
= (-210 hours) $17.00 per hour = $3,570 F

d. Labor rate variance = AH(AR - SR)
= 2,310 hours ($17.10 per hour - $17.00 per hour)
= 2,310 hours ($0.10 per hour) = $231 U

e. SH = 8,400 units × 0.3 hours per unit = 2,520 hours
Variable overhead efficiency variance = (AH - SH) SR
= (2,310 hours - 2,520 hours) $6.00 per hour
= (-210 hours) $6.00 per hour = $1,260 F

f. Variable overhead rate variance = AH(AR - SR)
= 2,310 hours ($5.50 per hour - $6.00 per hour)
= 2,310 hours ($0.50 per hour) = $1,155 F
Chapter 10 - Standard Costs and Variances

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Medium
162. Blomdahl Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity or Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>5.2 kilos</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.3 hours</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.3 hours</td>
</tr>
<tr>
<td></td>
<td>$6.00 per kilo</td>
</tr>
<tr>
<td></td>
<td>$22.00 per hour</td>
</tr>
</tbody>
</table>

The company reported the following results concerning this product in October.

The materials price variance is recognized when materials are purchased. Variable overhead is applied on the basis of direct labor-hours.

Required:

a. Compute the materials quantity variance.

b. Compute the materials price variance.

c. Compute the labor efficiency variance.

d. Compute the direct labor rate variance.

e. Compute the variable overhead efficiency variance.

f. Compute the variable overhead rate variance.

a. SQ = 8,100 units $ 5.2 kilos per unit = 42,120 kilos 
Materials quantity variance = (AQ - SQ) SP
= (43,130 kilos - 42,120 kilos) $6.00 per kilo
= (1,010 kilos) $6.00 per kilo = $6,060 U

b. Materials price variance = AQ (AP - SP)
= 46,700 kilos ($5.70 per kilo - $6.00 per kilo)
= 46,700 kilos ($0.30 per kilo) = $14,010 F

c. SH = 8,100 units $ 0.3 hours per unit = 2,430 hours
Labor efficiency variance = (AH - SH) SR
= (2,570 hours - 2,430 hours) $22.00 per hour
= (140 hours) $22.00 per hour = $3,080 U

d. Labor rate variance = AH(AR - SR)
= 2,570 hours ($23.70 per hour - $22.00 per hour)
= 2,570 hours ($1.70 per hour) = $4,369 U

e. SH = 8,100 units $ 0.3 hours = 2,430 hours
Variable overhead efficiency variance = (AH - SH) SR
= (2,570 hours - 2,430 hours) $2.00 per hour
= (140 hours) $2.00 per hour = $280 U

f. Variable overhead rate variance = AH(AR - SR)
= 2,570 hours ($1.80 per hour - $2.00 per hour)
= 2,570 hours ($0.20 per hour) = $514 F
Chapter 10 - Standard Costs and Variances

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy
163. Silmon Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity or Hours</th>
<th>Standard Price or Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>4.9 grams</td>
<td>$7.00 per gram</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.6 hours</td>
<td>$14.00 per hour</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.6 hours</td>
<td>$4.00 per hour</td>
</tr>
</tbody>
</table>

In June the company produced 4,200 units using 21,830 grams of the direct material and 2,580 direct labor-hours. During the month the company purchased 24,100 grams of the direct material at a price of $6.80 per gram. The actual direct labor rate was $14.60 per hour and the actual variable overhead rate was $3.90 per hour. The materials price variance is computed when materials are purchased. Variable overhead is applied on the basis of direct labor-hours. Required:

a. Compute the materials quantity variance.
b. Compute the materials price variance.
c. Compute the labor efficiency variance.
d. Compute the direct labor rate variance.
e. Compute the variable overhead efficiency variance.
f. Compute the variable overhead rate variance.

a. SH = 4,200 units \times 4.9 \text{ grams per unit} = 20,580 \text{ grams}

Materials quantity variance = (AQ - SQ) SP
= (21,830 \text{ grams} - 20,580 \text{ grams}) \times 7.00 \text{ per gram}
= (1,250 \text{ grams}) \times 7.00 \text{ per gram} = $8,750 \text{ U}

b. Materials price variance = AQ (AP - SP)
= 24,100 \text{ grams} \times (6.80 \text{ per gram} - 7.00 \text{ per gram})
= 24,100 \text{ grams} \times (-0.20 \text{ per gram}) = $4,820 \text{ F}

c. SH = 4,200 units \times 0.6 \text{ hours per unit} = 2,520 \text{ hours}

Labor efficiency variance = (AH - SH) SR
= (2,580 \text{ hours} - 2,520 \text{ hours}) \times 14.00 \text{ per hour}
= (60 \text{ hours}) \times 14.00 \text{ per hour} = $840 \text{ U}

d. Labor rate variance = AH(AR - SR)
= 2,580 \text{ hours} \times (14.60 \text{ per hour} - 14.00 \text{ per hour})
= 2,580 \text{ hours} \times 0.60 \text{ per hour} = $1,548 \text{ U}

e. SH = 4,200 units \times 0.6 \text{ hours per unit} = 2,520 \text{ hours}

Variable overhead efficiency variance = (AH - SH) SR
= (2,580 \text{ hours} - 2,520 \text{ hours}) \times 4.00 \text{ per hour}
= (60 \text{ hours}) \times 4.00 \text{ per hour} = $240 \text{ U}

f. Variable overhead rate variance = AH(AR - SR)
= 2,580 \text{ hours} \times (3.90 \text{ per hour} - 4.00 \text{ per hour})
= 2,580 \text{ hours} \times (-0.10 \text{ per hour}) = $258 \text{ F}
Chapter 10 - Standard Costs and Variances

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy
164. Igel Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity or Hours</th>
<th>Standard Price or Rate</th>
<th>Standard Cost Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>4.3 pounds</td>
<td>$6.00 per pound</td>
<td>$25.80</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.7 hours</td>
<td>$20.00 per hour</td>
<td>$14.00</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.7 hours</td>
<td>$2.00 per hour</td>
<td>$1.40</td>
</tr>
</tbody>
</table>

The company reported the following results concerning this product in September.

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

Required:

a. Compute the materials quantity variance.
b. Compute the materials price variance.
c. Compute the labor efficiency variance.
d. Compute the direct labor rate variance.
e. Compute the variable overhead efficiency variance.
f. Compute the variable overhead rate variance.

a. SH = 1,700 units × 4.3 pounds per unit = 7,310 pounds
   Materials quantity variance = (AQ - SQ) SP
   = (7,210 pounds - 7,310 pounds) $6.00 per pound
   = (-100 pounds) $6.00 per pound = $600 F
b. Materials price variance = (AQ × AP) - (AQ × SP)
   = $43,320 - (7,600 pounds × $6 per pound)
   = $43,320 - $45,600 = $2,280 F
c. SH = 1,700 units × 0.7 hours per unit = 1,190 hours
   Labor efficiency variance = SR(AH - SH)
   = $20 per hour (1,260 hours - 1,190 hours)
   = $20 per hour (70 hours) = $1,400 U
d. Labor rate variance = (AH × AR) - (AH × SR)
   = $25,578 - (1,260 hours × $20 per hour)
   = $25,578 - $25,200 = $378 U
e. SH = 1,700 units × 0.7 hours per unit = 1,190 hours
   Variable overhead efficiency variance = (AH - SH) SR
   = (1,260 hours - 1,190 hours) $2 per hour
   = (70 hours) $2 per hour = $140 U
f. Variable overhead rate variance = (AH × AR) - (AH × SR)
   = $2,394 - (1,260 hours × $2 per hour)
   = $2,394 - $2,520 = $126 F
Chapter 10 - Standard Costs and Variances

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Medium
Chapter 10 - Standard Costs and Variances

165. Schlager Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity or Hours</th>
<th>Standard Price or Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>7.8 kilos</td>
<td>$1.00 per kilo</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.4 hours</td>
<td>$18.00 per hour</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.4 hours</td>
<td>$3.00 per hour</td>
</tr>
</tbody>
</table>

The company reported the following results concerning this product in August.

| Actual output | 8,500 units |
| Purchases of raw materials | 65,550 kilos |
| Actual direct labor-hours | 3,410 hours |
| Actual direct labor cost | $66,495 |
| Actual variable overhead cost | $9,889 |

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

Required:

a. Compute the materials quantity variance.
b. Compute the materials price variance.
c. Compute the labor efficiency variance.
d. Compute the direct labor rate variance.
e. Compute the variable overhead efficiency variance.
f. Compute the variable overhead rate variance.

a. \( \text{SH} = 8,500 \text{ units} \times 7.8 \text{ kilos per unit} = 66,300 \text{ kilos} \)
\( \text{Materials quantity variance} = (AQ - SQ) \times SP \)
\( = (65,550 \text{ kilos} - 66,300 \text{ kilos}) \times $1.00 \text{ per kilo} \)
\( = (-750 \text{ kilos}) \times $1.00 \text{ per kilo} = $750 \text{ F} \)
b. \( \text{Materials price variance} = (AQ \times AP) - (AQ \times SP) \)
\( = $75,900 - (69,000 \text{ kilos} \times $1.00 \text{ per kilo}) \)
\( = $75,900 - $69,000 = $6,900 \text{ U} \)
c. \( \text{SH} = 8,500 \text{ units} \times 0.4 \text{ hours per unit} = 3,400 \text{ hours} \)
\( \text{Labor efficiency variance} = (AH - SH) \times SR \)
\( = (3,410 \text{ hours} - 3,400 \text{ hours}) \times $18.00 \text{ per hour} \)
\( = (10 \text{ hours}) \times $18.00 \text{ per hour} = $180 \text{ U} \)
d. \( \text{Labor rate variance} = (AH \times AR) - (AH \times SR) \)
\( = $66,495 - (3,410 \text{ hours} \times $18.00 \text{ per hour}) \)
\( = $66,495 - $61,380 = $5,115 \text{ U} \)
e. \( \text{SH} = 8,500 \text{ units} \times 0.4 \text{ hours per unit} = 3,400 \text{ hours} \)
\( \text{Variable overhead efficiency variance} = (AH - SH) \times SR \)
\( = (3,410 \text{ hours} - 3,400 \text{ hours}) \times $3.00 \text{ per hour} \)
\( = (10 \text{ hours}) \times $3.00 \text{ per hour} = $30 \text{ U} \)
f. \( \text{Variable overhead rate variance} = (AH \times AR) - (AH \times SR) \)
\( = $9,889 - (3,410 \text{ hours} \times $3.00 \text{ per hour}) \)
\( = $9,889 - $10,230 = $341 \text{ F} \)
Chapter 10 - Standard Costs and Variances

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy
166. Leerar Corporation makes a product with the following standard costs:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Standard Quantity or Hours</th>
<th>Standard Price or Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>8.1 ounces</td>
<td>$3.00 per ounce</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.5 hours</td>
<td>$18.00 per hour</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.5 hours</td>
<td>$2.00 per hour</td>
</tr>
</tbody>
</table>

In December the company produced 4,200 units using 34,870 ounces of the direct material and 1,900 direct labor-hours. During the month, the company purchased 39,700 ounces of the direct material at a total cost of $111,160. The actual direct labor cost for the month was $35,530 and the actual variable overhead cost was $3,990. The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

Required:

a. Compute the materials quantity variance.
b. Compute the materials price variance.
c. Compute the labor efficiency variance.
d. Compute the direct labor rate variance.
e. Compute the variable overhead efficiency variance.
f. Compute the variable overhead rate variance.

a. SQ = 4,200 units × 8.1 ounces per unit = 34,020 ounces
Materials quantity variance = (AQ - SQ) SP
= (34,870 ounces - 34,020 ounces) $3.00 per ounce
= (850 ounces) $3.00 per ounce = $2,550 U

b. Materials price variance = (AQ × AP) - (AQ × SP)
= $111,160 - (39,700 ounces × $3.00 per ounce)
= $111,160 - $119,100 = $7,940 F

c. SH = 4,200 units × 0.5 hours per unit = 2,100 hours
Labor efficiency variance = (AH - SH) SR
= (1,900 hours - 2,100 hours) $18.00 per hour
= (-200 hours) $18.00 per hour = $3,600 F

d. Labor rate variance = (AH × AR) - (AH × SR)
= $35,530 - (1,900 hours × $18.00 per hour)
= $35,530 - $34,200 = $1,330 U

e. SH = 4,200 units × 0.5 hours per unit = 2,100 hours
Variable overhead efficiency variance = (AH - SH) SR
= (1,900 hours - 2,100 hours) $2.00 per hour
= (-200 hours) $2.00 per hour = $400 F

f. Variable overhead rate variance = (AH × AR) - (AH × SR)
= $3,990 - (1,900 hours × $2.00 per hour)
= $3,990 - $3,800 = $190 U
167. Diamond Company produces a single product. The company has set the following standards for materials and labor:

<table>
<thead>
<tr>
<th></th>
<th>Standard quantity or hours per unit</th>
<th>Standard price or rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>? pounds per unit</td>
<td>$? per pound</td>
</tr>
<tr>
<td>Direct labor</td>
<td>3.0 hours per unit</td>
<td>$10 per hour</td>
</tr>
</tbody>
</table>

During the past month, the company purchased 7,000 pounds of direct materials at a cost of $17,500. All of this material was used in the production of 1,300 units of product. Direct labor cost totaled $36,750 for the month. The following variances have been computed:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials quantity variance</td>
<td>$1,375 U</td>
</tr>
<tr>
<td>Total materials variance</td>
<td>$375 F</td>
</tr>
<tr>
<td>Labor efficiency variance</td>
<td>$4,000 F</td>
</tr>
</tbody>
</table>

Required:
1. For direct materials:
   a. Compute the standard price per pound of materials.
   b. Compute the standard quantity allowed for materials for the month's production.
   c. Compute the standard quantity of materials allowed per unit of product.
2. For direct labor:
   a. Compute the actual direct labor cost per hour for the month.
   b. Compute the labor rate variance.
Chapter 10 - Standard Costs and Variances

1. a. Materials price variance = AQ (AP - SP)
   $1,750 F* = 7,000 pounds ($2.50 per pound** - SP)
   -$1,750 = $17,500 - 7,000 pounds × SP
   7,000 pounds × SP = $19,250
   SP = $2.75 per pound
   * $1,375U + $375 F = $1,750 F
   ** 17,500 ÷ 7,000 pounds = $2.50 per pound
   b. Materials quantity variance = (AQ - SQ) SP
   $1,375 U = (7,000 pounds - SQ) $2.75 per pound
   $1,375 = $19,250 - SQ × $2.75 per pound
   SQ × $2.75 per pound= $17,875
   SQ = $17,875 ÷ $2.75 per pound
   SQ = 6,500 pounds
   c. 6,500 pounds ÷ 1,300 units = 5 pounds per unit.

2. a. Labor efficiency variance = (AH - SH) SR
   $4,000 F = (AH - 3,900 hours*)$10 per hour
   -$4,000 = AH × $10 per hour- $39,000
   AH × $10 per hour= $35,000
   AH = $35,000 ÷ $10 per hour
   AH = 3,500
   Therefore, $36,750 total labor cost ÷ 3,500 hours = $10.50 per hour.
   * 1,300 units × 3 hours per unit = 3,900 hours.
   b. Labor rate variance = AH(AR - SR)
   = 3,500 hours ($10.50 per hour - $10.00 per hour)
   = 3,500 hours ($0.50 per hour) = $1,750 U
The following materials standards have been established for a particular product:

<table>
<thead>
<tr>
<th>Standard quantity per unit of output</th>
<th>3.8 pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard price</td>
<td>$13.00 per pound</td>
</tr>
</tbody>
</table>

The following data pertain to operations concerning the product for the last month:

<table>
<thead>
<tr>
<th>Actual materials purchased</th>
<th>2,700 pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual cost of materials purchased</td>
<td>$34,155</td>
</tr>
<tr>
<td>Actual materials used in production</td>
<td>2,000 pounds</td>
</tr>
<tr>
<td>Actual output</td>
<td>500 units</td>
</tr>
</tbody>
</table>

Required:

a. What is the materials price variance for the month?
b. What is the materials quantity variance for the month?

a. Materials price variance = (AQ × AP) - (AQ × SP)
   = $34,155 - (2,700 pounds × $13 per pound)
   = $34,155 - $35,100 = $945 F

b. SQ = 500 units × 3.8 pounds per unit = 1,900 pounds

Materials quantity variance = (AQ - SQ) SP
   = (2,000 pounds - 1,900 pounds) $13 per pound
   = (100 pounds) $13 per pound = $1,300 U
169. The following standards have been established for a raw material used to make product P62:

| Standard quantity of the material per unit of output | 6.3 | pounds |
| Standard price of the material | $15.50 | per pound |

The following data pertain to a recent month’s operations:

| Actual material purchased | 6,700 | pounds |
| Actual cost of material purchased | $104,500 |
| Actual material used in production | 6,400 | pounds |
| Actual output | 920 | units of product P62 |

Required:

a. What is the materials price variance for the month?
b. What is the materials quantity variance for the month?

a. Materials price variance = \((AQ \times AP) - (AQ \times SP)\)
   
   \[= 100,500 - (6,700 \text{ pounds} \times 15.50 \text{ per pound})\]

   \[= 100,500 - 103,850 = 3,350 \text{ F} \]

b. SQ = 920 units \(\times\) 6.3 pounds per unit = 5,796 pounds

   Materials quantity variance = \((AQ - SQ) \times SP\)

   \[= (6,400 \text{ pounds} - 5,796 \text{ pounds}) \times 15.50 \text{ per pound}\]

   \[= (604 \text{ pounds}) \times 15.50 \text{ per pound} = 9,362 \text{ U} \]
170. The standards for product U31 call for 7.1 liters of a raw material that costs $12.10 per liter. Last month, 1,900 liters of the raw material were purchased for $23,180. The actual output of the month was 200 units of product U31. A total of 1,200 liters of the raw material were used to produce this output.

Required:

a. What is the materials price variance for the month?
b. What is the materials quantity variance for the month?

a. Materials price variance = (AQ \times AP) - (AQ \times SP)
   = $23,180 - (1,900 \text{ liters} \times $12.10 \text{ per liter})
   = $23,180 - $22,990 = $190 \text{ U}

b. SQ = 200 \text{ units} \times 7.1 \text{ liters per unit} = 1,420 \text{ liters}

Materials quantity variance = (AQ - SQ) SP
   = (1,200 \text{ liters} - 1,420 \text{ liters}) \times $12.10 \text{ per liter}
   = (-220 \text{ liters}) \times $12.10 \text{ per liter} = $2,662 \text{ F}
171. The following labor standards have been established for a particular product:

<table>
<thead>
<tr>
<th>Standard labor hours per unit of output</th>
<th>45 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard labor rate</td>
<td>$19.70 per hour</td>
</tr>
</tbody>
</table>

The following data pertain to operations concerning the product for the last month:

<table>
<thead>
<tr>
<th>Actual hours worked</th>
<th>6,500 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual total labor cost</td>
<td>$130,975</td>
</tr>
<tr>
<td>Actual output</td>
<td>1,400 units</td>
</tr>
</tbody>
</table>

Required:

a. What is the labor rate variance for the month?
b. What is the labor efficiency variance for the month?

a. Labor rate variance = (AH × AR) - (AH × SR)
= $130,975 - (6,500 hours × $19.70 per hour)
= $130,975 - $128,050 = $2,925 U

b. SH = 1,400 units × 4.5 hours per unit = 6,300 hours
Labor efficiency variance = (AH - SH) SR
= (6,500 hours - 6,300 hours) $19.70 per hour
= (200 hours) $19.70 per hour = $3,940 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Level: Easy
172. The following direct labor standards have been established for product E450:

<table>
<thead>
<tr>
<th>Standard direct labor hours</th>
<th>9.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard direct labor wage rate per hour</td>
<td>$13.00</td>
</tr>
</tbody>
</table>

The following data pertain to last month’s operations:

| Actual output of product E450 | 1,120 units |
| Actual direct labor-hour workload | 9,300 hours |
| Actual direct labor wages paid | $115,320 |

Required:

a. What was the labor rate variance for the month?

b. What was the labor efficiency variance for the month?

a. Labor rate variance = (AH × AR) - (AH × SR)

= $115,320 - (9,300 hours × $13.00 per hour)

= $115,320 - $120,900 = $5,580 F

b. SH = 1,120 units × 8.2 hours per unit = 9,184 hours

Labor efficiency variance = (AH - SH) SR

= (9,300 hours - 9,184 hours) $13.00 per hour

= (116 hours) $13.00 per hour = $1,508 U

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Level: Easy
Chapter 10 - Standard Costs and Variances

173. The standards for product C54L specify 4.5 direct labor-hours per unit at $12.40 per direct labor-hour. Last month 1,560 units of product C54L were produced using 7,000 direct labor-hours at a total direct labor wage cost of $86,100.

Required:
a. What was the labor rate variance for the month?
b. What was the labor efficiency variance for the month?

a. Labor rate variance = (AH × AR) - (AH × SR)
   = $86,100 - (7,000 hours × $12.40 per hour)
   = $86,100 - $86,800 = $700 F

b. SH = 1,560 units × 4.5 hours per unit = 7,020 hours
   Labor efficiency variance = (AH - SH) SR
   = (7,000 hours - 7,020 hours) $12.40 per hour
   = (-20 hours) $12.40 per hour = $248 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance
Level: Easy
174. The following standards for variable overhead have been established for a company that makes only one product:

<table>
<thead>
<tr>
<th>Standard hours per unit of output</th>
<th>5.7 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard variable overhead rate</td>
<td>$13.95 per hour</td>
</tr>
</tbody>
</table>

The following data pertain to operations for the last month:

| Actual hours | 9,200 hours |
| Actual total variable overhead cost | $125,120 |
| Actual output | 1,600 units |

Required:

a. What is the variable overhead rate variance for the month?
b. What is the variable overhead efficiency variance for the month?

\[ \text{Variable overhead rate variance} = (AH \times AR) - (AH \times SR) \]
\[ = $125,120 - (9,200 \text{ hours} \times $13.95 \text{ per hour}) \]
\[ = $125,120 - $128,340 = $3,220 \text{ F} \]

b. SH = 1,600 units \times 5.7 hours per unit = 9,120 hours

\[ \text{Variable overhead efficiency variance} = (AH - SH) \times SR \]
\[ = (9,200 \text{ hours} - 9,120 \text{ hours}) \times $13.95 \text{ per hour} \]
\[ = 80 \text{ hours} \times $13.95 \text{ per hour} = $1,116 \text{ U} \]
175. Imme Corporation's variable overhead is applied on the basis of direct labor-hours. The company has established the following variable overhead standards for product I81Z:

<table>
<thead>
<tr>
<th>Standard direct labor-hours</th>
<th>3.5 hours per unit of I81Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard variable overhead rate</td>
<td>$7.60 per hour</td>
</tr>
</tbody>
</table>

The following data pertain to the most recent month's operations during which 1,360 units of product I81Z were made:

<table>
<thead>
<tr>
<th>Actual direct labor-hours worked</th>
<th>4,600 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual variable overhead incurred</td>
<td>$38,640</td>
</tr>
</tbody>
</table>

Required:

a. What was the variable overhead rate variance for the month?
b. What was the variable overhead efficiency variance for the month?

a. Variable overhead rate variance = (AH × AR) - (AH × SR)
   = $38,640 - (4,600 hours × $7.60 per hour)
   = $38,640 - $34,960 = $3,680 U

b. SH = 1,360 units × 3.5 hours per unit = 4,760 hours
   Variable overhead efficiency variance = (AH - SH) SR
   = (4,600 hours - 4,760 hours) $7.60 per hour
   = (-160 hours) $7.60 per hour = $1,216 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy
176. Stelluti Corporation's variable overhead is applied on the basis of direct labor-hours. The standard cost card for product H67F specifies 7.8 direct labor-hours per unit of H67F. The standard variable overhead rate is $6.50 per direct labor-hour. During the most recent month, 400 units of product H67F were made and 2,900 direct labor-hours were worked. The actual variable overhead incurred was $20,155.

Required:

a. What was the variable overhead rate variance for the month?

b. What was the variable overhead efficiency variance for the month?

a. Variable overhead rate variance = (AH × AR) - (AH × SR)
= $20,155 - (2,900 hours × $6.50 per hour)
= $20,155 - $18,850 = $1,305 U

b. SH = 400 units × 7.8 hours per unit = 3,120 hours
Variable overhead efficiency variance = (AH - SH) SR
= (2,900 hours - 3,120 hours) $6.50 per hour
= (-220 hours) $6.50 per hour = $1,430 F

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Easy
177. The following data for November have been provided by Rickenbaker Corporation, a producer of precision drills for oil exploration:

<table>
<thead>
<tr>
<th>Budgeted production</th>
<th>4,000</th>
<th>drills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard machine-hour per drill</td>
<td>8.4</td>
<td>machine-hours</td>
</tr>
<tr>
<td>Standard indirect labor</td>
<td>$9.40</td>
<td>per machine-hour</td>
</tr>
<tr>
<td>Standard power</td>
<td>$2.90</td>
<td>per machine-hour</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actual production</th>
<th>4,300</th>
<th>drills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual machine-hours</td>
<td>36,530</td>
<td>machine-hours</td>
</tr>
<tr>
<td>Actual indirect labor</td>
<td>$362,756</td>
<td></td>
</tr>
<tr>
<td>Actual power</td>
<td>$97,693</td>
<td></td>
</tr>
</tbody>
</table>

Required:
Compute the variable overhead rate variances for indirect labor and for power for November. Indicate whether each of the variances is favorable (F) or unfavorable (U). Show your work!

Indirect labor:
Variable overhead rate variance = (AH \times AR) - (AH \times SR)
= $362,756 - (36,530 \text{ hours} \times $9.40 \text{ per hour})
= $362,756 - $343,382 = $19,374 \text{ U}

Power:
Variable overhead rate variance = (AH \times AR) - (AH \times SR)
= $97,693 - (36,530 \text{ hours} \times $2.90 \text{ per hour})
= $97,693 - $105,937 = $8,244 \text{ F}

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom’s: Application
Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Medium
The following data have been provided by Tiano Corporation:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Budgeted production</strong></td>
<td>8,300</td>
<td></td>
</tr>
<tr>
<td><strong>Standard machine-hours per unit</strong></td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td><strong>Standard lubricants</strong></td>
<td>$5.10</td>
<td>per machine-hour</td>
</tr>
<tr>
<td><strong>Standard supplies</strong></td>
<td>$2.90</td>
<td>per machine-hour</td>
</tr>
</tbody>
</table>

|                                |     |     |
| **Actual production**          | 8,600 |     |
| **Actual machine-hours**       | 38,270 |     |
| **Actual lubricants**          | $211,801 |     |
| **Actual supplies**            | $107,566 |     |

Required:
Compute the variable overhead rate variances for lubricants and for supplies. Indicate whether each of the variances is favorable (F) or unfavorable (U). Show your work!

**Lubricants:**
Variable overhead rate variance = (AH × AR) - (AH × SR)
= $211,801 - (38,270 hours × $5.10 per hour)
= $211,801 - $195,177 = $16,624 U

**Supplies:**
Variable overhead rate variance = (AH × AR) - (AH × SR)
= $107,566 - (38,270 hours × $2.90 per hour)
= $107,566 - $110,983 = $3,417 F
179. Buis Corporation, which makes landing gears, has provided the following data for a recent month:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted production</td>
<td>1,200</td>
</tr>
<tr>
<td>Standard machine-hours per</td>
<td>5.9</td>
</tr>
<tr>
<td>gear</td>
<td></td>
</tr>
<tr>
<td>Budgeted supplies cost</td>
<td>$6.50</td>
</tr>
<tr>
<td>per machine-hour</td>
<td></td>
</tr>
<tr>
<td>Actual production</td>
<td>1,300</td>
</tr>
<tr>
<td>machine-hours</td>
<td></td>
</tr>
<tr>
<td>Actual supplies cost</td>
<td>$49,742</td>
</tr>
<tr>
<td>(total)</td>
<td></td>
</tr>
</tbody>
</table>

Required:
Determine the rate and efficiency variances for the variable overhead item supplies and indicate whether those variables are favorable or unfavorable. Show your work!

Variable overhead rate variance = \( (AH \times AR) - (AH \times SR) \)
= $49,742 - (7,950 \text{ hours} \times $6.50 \text{ per hour})
= $49,742 - $51,675 = $1,933 \text{ F}

\( SH = 1,300 \text{ units} \times 5.9 \text{ hours per unit} = 7,670 \text{ hours} \)
Variable overhead efficiency variance = \( (AH - SH) \times SR \)
= (7,950 \text{ hours} - 7,670 \text{ hours}) $6.50 \text{ per hour}
= (280 \text{ hours}) $6.50 \text{ per hour} = $1,820 \text{ U}
180. Vitko Corporation makes automotive engines. For the most recent month, budgeted production was 6,000 engines. The standard power cost is $8.80 per machine-hour. The company’s standards indicate that each engine requires 6.1 machine-hours. Actual production was 6,400 engines. Actual machine-hours were 38,730 machine-hours. Actual power cost totaled $350,628.

Required:
Determine the rate and efficiency variances for the variable overhead item power cost and indicate whether those variances are unfavorable or favorable. Show your work!

Variable overhead rate variance = (AH \times AR) - (AH \times SR)
= $350,628 - (38,730 \text{ hours} \times $8.80 \text{ per hour})
= $350,628 - $340,824 = $9,804 U

SH = 6.1 \text{ hours per unit} \times 6,400 \text{ units} = 39,040 \text{ hours}
Variable overhead efficiency variance = (AH - SH) SR
= (38,730 \text{ hours} - 39,040 \text{ hours}) $8.80 \text{ per hour}
= (-310 \text{ hours}) $8.80 \text{ per hour} = $2,728 F

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