

Section: Cost and Management Accounting

1. Tropics Fruit Company, based on Oahu, grows, processes, cans, and sells three main pineapple products: sliced, crushed, and juice. The outside skin is cut off in the Cutting Department and processed as animal feed. The feed is treated as a byproduct. The company's production process is as follows:
- ♦ Pineapples first are processed in the Cutting Department. The pineapples are washed, and the outside skin is cut away. Then the pineapples are cored and trimmed for slicing. The three main products (sliced, crushed, juice) and the byproduct (animal feed) are recognizable after processing in the Cutting Department. Each product then is transferred to a separate department for final processing.
 - ♦ The trimmed pineapples are sent to the Slicing Department, where the pineapples are sliced and canned. Any juice generated during the slicing operation is packed in the cans with the slices.
 - ♦ The pieces of pineapple trimmed from the fruit are diced and canned in the Crushing Department. Again, the juice generated during this operation is packed in the can with the crushed pineapple.
 - ♦ The core and surplus pineapple generated from the Cutting Department are pulverized into a liquid in the Juicing Department. There is an evaporation loss equal to 8% of the weight of the good output produced in this department which occurs as the juices are heated.
 - ♦ The outside skin is chopped into animal feed in the Feed Department.

Tropics Fruit Company uses the net realizable value method to assign the costs of the joint process to its main products. The net realizable value of the byproduct is subtracted from the joint cost before the allocation.

A total of 540,000 pounds were entered into the Cutting Department during June. There are no beginning and ending inventories. The following schedule shows the costs incurred in each department, the proportion by weight transferred to the four final processing departments, and the selling price of each end product.

Processing Data and Costs for June			
Department	Costs Incurred	Proportion of Product by Weight Transferred to Departments	Selling Price per Pound of Final Product
Cutting	\$240,000	—	None
Slicing	18,800	35%	\$1.20
Crushing	42,320	28%	1.10
Juicing	13,000	27%	0.60
Animal feed	<u>2,800</u>	<u>10%</u>	0.20
Total	<u>\$316,920</u>	<u>100%</u>	

Required:

- (1) Compute the amount of the cost of the Cutting Department allocated to the juice. (10%)
- (2) The company is considering whether to process the crushed pineapple into pineapple cakes. Assume four pounds of crushed pineapples can be processed into one piece of pineapple cake. The separable processing will cost \$0.9 per pound. Packaging costs for pineapples cakes are projected to be \$0.2 per

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piece, and the anticipated sales price is \$5.45 per piece. If the company uses the same allocation method to allocate joint costs, what will be the company's gross margin if all crushed pineapples are processed further into pineapple cakes? Assume there are no beginning and ending inventories for each product. (10%)

2. Harris Surfboards manufactures fiberglass surfboards. The company adopts a standard costing system. The standard usage of direct materials is 200 pounds per board, and the budgeted price is \$4 per pound. According to standard production, there is a learning curve in manufacturing labor hours. The standard learning curve percentage is 80% following the cumulative average-time learning model. It takes 10 labor hours to make the first board, and budgeted rate for direct labor is \$50 per hour. Following are additional data for the month of March:

Actual units completed	8 boards
Direct material purchases	1,800 pounds
Cost of direct material purchases	\$ 5,850
Actual direct manufacturing labor hours	45 hours
Actual direct-labor cost	\$ 2,160
Direct materials efficiency variance	\$320 U

There were no beginning inventories.

Required:

- (1) Calculate the direct manufacturing labor efficiency variance for March. (5%)
 - (2) Calculate the actual pounds of direct materials used in production in March. (5%)
 - (3) Calculate the direct materials price variance based on the quantity purchased. (5%)
3. Travelcraft, Inc. manufactures two types of suitcases: leather suitcase and acrylic suitcase. The firm has three manufacturing departments: Molding, Component, and Assembly. There are also two service departments: Power and Maintenance.

The sides of the cases are manufactured in the Molding Department. The frames, hinges, and locks are manufactured in the Component Department. The cases are completed in the Assembly Department. The Power Department and Maintenance Department provide services to the three manufacturing departments. Travelcraft expects to produce 20,000 leather suitcases and 30,000 acrylic suitcases in the next year.

The firm uses the step-down method to allocate service department costs to the manufacturing departments, with the Power Department costs allocated first. The Power Department costs are allocated using a dual-rate method: Fixed costs are allocated according to maximum allotted capacity, and variable costs are allocated according to planned usage for the coming year. The Maintenance Department costs are allocated using a single-rate method, based on the estimated usage for the coming year.

Karen Mason, director of cost management, has recommended that Travelcraft use departmental overhead rates to allocate overhead costs to products. The cost driver for the Molding Department is

接次頁

machine hours, and the cost drivers for the Component and Assembly Departments are direct labor hours. The planned operating costs and expected levels of activity for the coming year have been developed by Mason and are presented by department in the following schedules. Mason also prepared another figure showing each product's consumption of resources in the manufacturing departments.

Departmental Costs					
	Power	Maintenance	Molding	Component	Assembly
Direct materials	\$10,000	\$3,000	\$24,800	\$ 60,000	\$ 2,500
Direct labor	2,800	4,500	7,000	40,000	24,000
Variable overhead	0	0	7,000	20,000	33,000
Fixed overhead	24,000	500	35,000	12,400	12,200
Total	\$36,800	\$8,000	\$73,800	\$132,400	\$71,700

Department Activity Measures					
	Power	Maintenance	Molding	Component	Assembly
Direct labor hours	250	400	500	2,000	1,500
Machine hours	210	60	875	125	0
Esteemed usage of maintenance hours	15	—	90	25	10
Power in kilowatt-hours					
Estimated usage	—	150	210	320	120
Maximum capacity	—	200	300	350	150

Product Resource Consumptions						
	Leather Suitcase			Acrylic Suitcase		
	Molding	Component	Assembly	Molding	Component	Assembly
Direct labor hours	150	1,200	1,000	350	800	500
Machine hours	250	75	0	625	50	0
Direct materials costs	\$13,456	\$42,000	\$ 1,400	\$11,344	\$18,000	\$ 1,100
Direct labor costs	2,000	26,624	15,376	5,000	13,376	8,624

Required:

- (1) Calculate the amount of service department costs allocated to the Molding Department and the Component Department. (10%)
- (2) Find the cost of leather suitcase per unit. (5%)

4. ClearView Company makes two products of window frames, Alpha and Beta. Each product is made of wood and metal, but Alpha is smaller than Beta. Budgetary information for the two products in year 2010 is given as the following tables:

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Direct Input per unit of Output		
	Alpha	Beta
Direct materials		
Wood (\$3.5 per pound)	4.1 pounds	5.8 pounds
Metal (\$3.2 per pound)	0.5 pound	1 pound
Direct manufacturing labor-hours (\$12 per hour)	3 hours	4 hours
Direct Materials Inventory		
	Wood	Metal
Beginning inventory	250 pounds	60 pounds
Target ending inventory	380 pounds	55 pounds
Cost of beginning inventory	\$950	\$180
Finished Goods Inventory		
	Alpha	Beta
Expected demand in units	520	320
Target ending inventory in units	35	15
Beginning inventory in units	15	30
Beginning inventory in dollars	\$1,500	\$5,580

ClearView uses a FIFO cost flow assumption to account for direct materials inventory and finished goods inventory, and supposes no ending work-in-process inventory every month.

ClearView uses an activity-based costing system and classifies overhead into three activity pools: Setup, Processing and Inspection. Activity rates for these activities are \$100 per setup hour, \$5 per machine hour, and \$16 per inspection hour, respectively. Other information follows:

Cost driver information		
	Alpha	Beta
Number of units per batch	20	15
Setup time per batch	1.5 hours	1.75 hours
Inspection time per batch	0.5 hour	0.6 hour
Machine-hours (MH)	12 MH	16 MH

Non-manufacturing fixed costs for 2009 equal \$36,000, of which half are salaries. Salaries are expected to increase 5% in 2010. The only variable non-manufacturing cost is sales commission, equal to \$2 per unit sold.

Required:

Ignore income tax. Solve the following two independent cases:

- (1) ClearView has a total investment in capital of \$150,000 and requires a 10% annual target return on investment. ClearView applies equal markup percentage to Alpha and Beta. Calculate the markup percentage on total manufacturing cost, in order to achieve the target level of return on investment. (15%)
- (2) Suppose in 2010 ClearView sells both of Alpha and Beta with price \$200. Currently the management decides to retire some old machines, leaving only 8,000 machine hours in year 2010 for producing Alpha and Beta. Determine ClearView's net income generated by optimal production mix. (10%)

5. Roxy Division, an investment center of Baxter Company, manufactures and sells office furniture. Baxter requires a 11% rate of return from Roxy. Roxy Division applies weighted-average method process costing for its assembly-line production process. All direct materials are introduced at the start of the process, and conversion cost is incurred evenly throughout manufacturing.

An examination of the company's Work-in-Process account for year 2009 revealed the following selected information:

Debit side—

Beginning balance in 2009: 600 units, 40% complete; cost, \$44,600*

Production started: 1,800 units

Direct materials used during 2009: \$90,000

Conversion cost during 2009: \$51,400

Ending balance in 2009: 1,000 units, ?% complete; cost, \$?*

Credit side—

Production completed: 1,400 units ***

* Supplementary records disclosed direct material cost of \$30,000 and conversion cost of \$14,600.

** The information for the cost and completion percentage of ending work-in-process is missing.

***The costs of the 1,400 completed units, currently under weighted-average method, would be \$3,020 higher if first-in-first-out (FIFO) method has been applied.

For year 2009, Roxy has no beginning and ending inventory of finished goods. All completed products are sold with unit price \$250. Total non-manufacturing costs are \$85,000. Also in 2009, Roxy Division shows its performance of residual income \$6,000.

Required: Determine Roxy's divisional return on investment (ROI) for year 2009 (Rounding to the nearest dollar). (15%)

6. Patio Company is currently purchasing part no. 678 from an outside supplier for \$90 per unit. Because of supplier reliability problems, the company is considering producing the part internally in a currently idle manufacturing plant. Annual volume over the next five years is expected to total 400,000 units at variable manufacturing costs of \$88 per unit.

Patio must acquire \$200,000 of new equipment if it reopens the plant. The equipment has a five-year service life and \$20,000 salvage value, and will be depreciated by the double-decline method. Normal equipment maintenance is expected to total \$12,000 in year 4, and the equipment will be sold at the end of its life. The company is subject to a 30% income tax rate. Patio is using a 12% after-tax hurdle rate for evaluating its capital budgeting projects.

Required: In the above make-or-buy decision, determine the difference in net-present-value (NPV) between the alternatives of making and purchasing part no. 678 (Rounding to the nearest dollar). (10%)