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國立臺灣大學 106 學年度碩士班招生考試試題

科目： 成本及管理會計學

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Problem 1 [25%]

Scot Company plans to sell 400,000 units of widget in July 20X1. Management (1) anticipates a growth rate in sales of 5% per month thereafter, and (2) desires a monthly ending finished goods inventory (in units) of 80% of the following month's estimated sales.

Budgeted standards of direct inputs for one unit of widget are as follows:

	<u>Price</u>	<u>Quantity</u>
Direct materials	\$8 per pound	5 pounds per unit
Direr labor	\$16 per hour	3 hours per unit
Machine hour	\$32 per hour	2.5 hours per unit

The firm requires a stock of direct materials at the end of each month equal to 25% of the following month's production material usage. 40% of the purchases are paid for in cash in the month of purchase, and the balance is paid in the following month.

Variable manufacturing overhead costs are allocated at a standard rate of \$18 per direct labor hour, and fixed manufacturing overhead costs are allocated based on machine hours. Actual production for this quarter (ended September 30, 20X1) is 1,310,000 units. Actual price paid for direct materials is \$8.2 per pound for a total of 6,900,000 pounds purchased. Management discovered the following variances: direct materials flexible-budget variance of \$716,000 (favorable), direct labor efficiency variance of \$2,515,200 (unfavorable), and variable overhead spending variance of \$817,440 (unfavorable). Direct materials price variance is recorded based on the quantity purchased.

Required:

- (1) Determine the budgeted amount of cash disbursements for August. (5%)
- (2) Compute the actual usage of direct materials per widget. (5%)
- (3) Compute the total variable overhead variance for this quarter. (5%)
- (4) Compute the fixed overhead production-volume variance for this quarter. (5%)
- (5) Discuss how variances can be used in a balanced scorecard framework. (5%)

Problem 2 [25%]

Sunny Inc. manufactures two sizes of car doors: large and small. Each door is processed through two operating departments—stamping and pressing. Two support departments—human resources (HR) and information systems (IS)—provide services to the operating departments. According to estimated customer demand, Sunny expects to produce 1,000 large doors and 300 small doors in the next year.

The company allocates service department costs to the operating departments using the step-down method which first allocates HR costs. HR costs are allocated based on number of employees, and IS costs are allocated based on processing hours. Budgetary costs and activity measures for each department are given in the following table:

	<u>HR</u>	<u>IS</u>	<u>Stamping</u>	<u>Pressing</u>
Direct materials	\$ 1,200	\$ 2,500	\$ 2,360	\$ 4,720
Direct labor	4,000	5,500	36,000	7,200
Variable overhead	0	0	14,120	20,000
Fixed overhead	<u>12,000</u>	<u>10,800</u>	<u>7,000</u>	<u>11,000</u>
Total costs	<u>\$17,200</u>	<u>\$18,800</u>	<u>\$59,480</u>	<u>\$42,920</u>
Number of employees	160	200	500	300
Processing hours	1,000	3,000	200	800

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Management decides to adopt activity-based costing system to allocate variable manufacturing overhead in the operating departments to products. Variable overhead is comprised of three activities: setup costs \$9,000, machining costs \$22,400, and inspection costs \$2,720. Cost drivers for each activity are setup hours, machine hours, and inspection hours, respectively. All fixed overhead in operating departments plus total service costs are allocated to each product based on a single allocation base—direct labor hours expected to be used in production for the next year. The only variable non-manufacturing cost is sales commission, equal to \$2 per unit sold. Non-manufacturing fixed costs equal \$12,000, including distribution, marketing and administrative costs. There are no beginning inventories. The following actual data (all meets the budgetary estimates) for the two products are available:

	<u>Large</u>	<u>Small</u>
Direct materials per unit (\$3 per pound)	2.0 pounds	1.2 pounds
Direct labor per unit (\$12 per pound)	3.0 hours	2.0 hours
Number of units per batch	20	15
Setup time per batch	1.2 hours	1.5 hours
Machine hours per unit	4.0 hours	1.6 hours
Inspection time per batch	2.5 hours	2.25 hours
Selling price per unit	\$162	\$130
Sales volume (units)	800	200

Required:

- (1) Calculate the total service department costs allocated to the stamping department. (5%)
- (2) Calculate total manufacturing overhead for one unit of small door. (5%)
- (3) If the company adopts variable costing, calculate the breakeven revenues. Assume actual sales follow the pre-determined sales mix. (5%)
- (4) Determine the degree of operating leverage under absorption costing. (5%)
- (5) Suppose direct labor has a limited capacity of 3,000 hours, and fixed overhead is allocated based on the available capacity instead of expected demand. The company produces each product following the optimal production mix. Assume sales volume remains the same, calculate the amount of operating income difference between absorption costing and variable costing. (5%)

Problem 3 [20%]

Superior Inc is located in a French-speaking county in Netherland. The company makes chocolate truffles that are sold in embossed tins. The company has two production department-Mixing and Molding. In the Mixing Department, the raw ingredients for the truffles are mixed in special candy-making pot. In the Molding Department, the mixed ingredients from the Mixing Department are carefully poured into molds and decorated. After cooling, the truffles are packed for sale. Superior currently produces two chocolate truffles products: Patisserie and Signature. Data regarding these two products follows:

	<u>Patisserie</u>	<u>Signature</u>
Direct Labor hours required per unit	4.50	5.20
Machine hours required per unit	6.80	5.50
Standard cost per unit:		
Direct material	\$ 7.30	\$ 9.50
Direct labor	11.25	13.00
Variable manufacturing overhead*	9.00	10.40
Fixed manufacturing overhead**	<u>10.20</u>	<u>8.25</u>
Total	<u>\$ 37.75</u>	<u>\$ 41.15</u>

* Applied on the basis of direct labor hours

** Applied on the basis of machine hours

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The company requires 8,300 units of Patisserie and 10,900 units of Signature. Recently, management decided to devote some labor and machine time for testing new products, resulting in only 156,000 labor hours and 83,200 machine hours per year that can be dedicated to production of Patisserie and Signature. An outside bakery store has offered to sell Superior chocolate truffles at unit prices of \$35.00 for Patisserie and \$35.00 for Signature.

Required:

- (1) Superior makes all decisions to maximize its profits. Compute the Superior's maximized cost saving from producing (rather than purchasing from outside bakery store) Patisserie and Signature. (10 %)
- (2) Superior is reviewing an investment proposal on a new candy-making pot for Mixing Department. The investment requires an initial cost of \$78,500. There will be no salvage value at the end of the investment's life. An estimate of the investment's end-of-year book value, end-of-year salvage value, the annual sales revenue, the annual after-tax net cash inflows, and the annual net income are presented in the schedule below. Yearly after-tax net cash inflows include savings from the depreciation tax shield.

<u>Year</u>	<u>End-of-year Book Value</u>	<u>End-of-year Salvage Value</u>	<u>Annual Sales Revenue</u>	<u>Annual after-tax Net Cash Inflows</u>	<u>Annual Net Income</u>
1	\$52,900	\$52,900	\$ 220,000	\$ 29,800	\$ 3,800
2	31,500	31,500	196,800	25,900	5,300
3	15,800	15,800	132,700	21,700	4,500
4	5,200	5,200	113,500	18,300	6,700
5	0	0	<u>109,200</u>	<u>13,100</u>	<u>8,100</u>
			<u>\$ 772,200</u>	<u>\$108,800</u>	<u>\$28,400</u>

Superior uses a 12% after-tax target rate of return for new investment proposals. Calculate the proposal's net present value. Round to the nearest dollar. (10 %)

Problem 4 [20%]

Halo, Inc. produces and sells car seats. Halo's corporate headquarters is located in Taiwan and two divisions are located in Taiwan and Thailand. Taiwan division has a strong local market for product TW17. The variable production cost is \$130. Taiwan division can sell TW17 in Taiwan for market price \$350. The applicable tax rate in Taiwan is 20%. Alternatively, Taiwan division can ship TW17 to Thailand division to further convert TW17 into a high-end product THAI17 for sale in Thailand market.

Thailand division produces and sells only one product THAI17. Thailand division can obtain TW17 from Taiwan divisions for an established transfer price that, based on Taiwan and Thailand tax laws, equalizes to the Taiwan market prices. Shipping fees to import TW17 from Taiwan division is \$65. Labor costs, overhead, and additional material for converting TW17 to THAI17 is \$680. Import duties levied on TW17 (to be paid by the Thailand division) takes 28% of transfer price. Alternatively, Thailand division can obtain TW17 from outside suppliers in Thailand for \$382. Halo's headquarters allows all divisional managers the decision rights on selecting inside or outside market for selling and purchasing TW17.

In 2016, Thailand division sold 192,000 units of THAI17 at \$5,350 each. Thailand division's salespeople are paid a 6% commission based on gross sales dollars. Thailand's sales manager oversees the placement of local advertising contracts, which totaled \$163,000 for the year. Local property taxes amounted to \$54,200. The sales manager's \$191,500 salary is set by Thailand divisional manager. In contrast, the divisional manager's \$358,800 salary is determined by Halo's vice president. Thailand division incurred \$19,800 of other noncontrollable costs. Nontraceable (common) corporate overhead totaled \$198,200. Thailand tax rate is 35%.

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Required:

- (1) Halo's accounting manager is wondering whether the whole company would be better off if Thailand division obtains TW17 from external suppliers, rather than internal transfer from Taiwan division. Determine for Halo's headquarters the difference in unit profit of TAHI17 between (a) internal transfer and (b) external Thailand suppliers as the source of TW17 for Thailand division. Show computations to support your answer. (10 %)
- (2) The Thailand divisional manager conducts business to maximize the division's profit. Determine the segment controllable profit margin on segmented income statement for Thailand division in 2016. (10 %)

Problem 5 [10%]

Evergreen Company manufactures tablet PCs and uses an operation-costing system. All tablet are processed through Department A and are subsequently processed in Department B or Department C depending on the type of components used.

In 2016, 315,000 tablets were produced, with 75 percent of the goods subsequently processed in Department B. There was no beginning or ending work in process. Operation information of the three departments is provided as follows:

	<u>Department A</u>	<u>Department B</u>	<u>Department C</u>
Conversion cost	\$288,600	\$87,500	\$63,400
Labor hours	11,500	3,000	1,200
Machine hours	5,860	1,500	5,600
Setup hours	300	120	510

Data pertaining to two orders, No. 1179 and No. 1185, were:

	<u>No. 1179</u>	<u>No. 1185</u>
Selling price	\$971,000	\$895,500
Direct materials	\$216,500	\$15,800
Number of tablets	1,980	1,250
Subsequent processing department	B	C

Required:

Determine the gross profits of orders No. 1179 (5 %) and No. 1185 (5 %).

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