※ 注意：請於試卷內之「非選擇題作答區」標明題號依序作答。

Problem 1 [20%]

Maple Life Company, headquartered in Montreal, is starting a new business venture in electronic products. Maple Leaf is in the process of evaluating its electronic product lines.

Classical light is one of the new electronic product lines. The classical light product line incurred $1,875,000 in development costs and is expected to be produced over the next 5 years. Each year, classical light is planned for 40 times of new design and, thereafter, will be put into production. Each new design requires a marketing cost $1,500. Current sales are expected to be 6,250 units of each light design. Based on the current pricing decision, classical light in the first year of product life-cycle will report an operating loss $46,500. Sales units equal production units each year.

Classical light requires direct costs of producing the designs average $1.25 per light. Indirect manufacturing costs are estimated at $125,000 per year. Customer service expenses average $0.25 per light.

Required:

(1) What is the total estimated life-cycle operating income for classical light? **(10 points)**

(2) If Maple Life changes classical light's selling price to be 450% markup based on the full manufacturing costs. What is the estimated life-cycle operating income for the first year? **(10 points)**

Problem 2 [20%]

Inbee Corporation is considering the acquisition of a new honey dipping machine that costs $595,000. The machine is expected to have a five-year service life and will help Inbee for annual savings in cash operating costs of $170,000. Inbee uses the sum-of-the-years'-digits method of depreciation and depreciates the asset over its five-year service life. Inbee Corporation is subject to a 25% income tax rate and has an after-tax hurdle rate of 12%.

Required:

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(1) Calculate the internal rate of return for the investment in new machine. **(5 points)** Whether Inbee should invest in the new machine based on the internal rate of return method? Explain. **(5 points)**

(2) Calculate the net present value for the investment in new machine. **(5 points)**

(3) Calculate the payback period for the investment in new machine. **(5 points)**

Problem 3 [20%]

KateSteel Corporation manufactures computer components. Lisa, the general manager of KateSteel's largest manufacturing plant, has just returned from a meeting at corporate headquarters where quality expectations were outlined for 2021. Lisa meets with Jack, the management accountant, to relay the corporate quality objective that total quality costs will not exceed 9% of total revenues by plant under any circumstances. Lisa asks Jack to provide a list of options for meeting corporate headquarters' quality objective. The plant's initial budgeted revenues and quality costs for 2021 are as follows:

Revenue	5,215,500
Quality costs:	
Materials scrap	16,350
Quality control training for production staff	7,350
Customer support	56,540
Warranty repairs	125,460
Design reviews	71,450
Rework of failed parts	26,850
Product inspection	161,560
Testing of purchased materials	47,620
Engineering redesign of failed parts	32,520

Prior to receiving the new corporate quality objective, Jack had collected information for all of the plant's possible options for improving both product quality and costs of quality. Jack was planning to introduce the idea of reengineering the manufacturing process at a one-time cost of $121,420, which would decrease product inspection costs by approximately 24% per year and was expected to reduce warranty repairs and customer support by an estimated 42% per year. After seeing the new corporate objective, Jack is reconsidering the reengineering idea.

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Jack crunches the numbers again to look for other alternatives. Jack concludes that by increasing the cost of quality control training for production staff by $23,420 per year, the company would reduce inspection costs by 11% annually and reduce warranty repairs and customer support costs by 22% per year as well.

Required:

(1) Prepare the cost-of-quality report of 2021 for the initial budgeted quality costs. **(12 points)**

(2) Prepare the cost-of-quality report of 2021 if introducing each option: (a) reengineer the manufacturing process for $121,420 and (b) increase quality training expenditure by $23,420 per year. **(8 points)**

Problem 4 [20%]

Best Around Inc. manufactures premium food processors. The following selected information was extracted from the accounting records of Best Around:

Budgeted fixed overhead: $92,329

Planned manufacturing activity: 36,350 machine hours

Standard variable-overhead rate per machine hour: $21

Variable-overhead efficiency variance: $61,677U

Total actual overhead: $912,473

Variable-overhead spending variance: $1,662F

Fixed-overhead budget variance: $1,121F

Required:

(1) Determine the fixed-overhead production volume variance. **(5 points)**

(2) Determine the actual fixed overhead. **(5 points)**

(3) Determine the actual variable overhead. **(5 points)**

(4) Determine the actual machine hours worked. **(5 points)**

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Problem 5 [20%]

Whitewater Corporation manufactures kayak components. The company has gathered the following information about two of its customers: Campa Equipment and Edith Refrigeration.

	Campa Equipment	Edith Refrigeration
Sales revenue	$62,135,500	$30,506,000
Cost of goods sold	27,455,000	19,652,000
Selling costs	8,670,000	6,213,500
Administrative costs	6,069,000	4,349,450

In addition to the above cost items, cost-driver data used by the firm and traceable to Campa and Edith are:

Customer Activity	Cost Driver	Pool Rate
Sales activity	Sales visits	$1,530
Order taking	Sales orders	425
Special handling	Units handled	51
Special shipping	Shipments	1,020

Customer Activity	Campa Equipment	Edith Refrigeration
Sales activity	136 visits	85 visits
Order taking	289 orders	379 orders
Special handling	10,200 units	9,350 units
Special shipping	323 shipments	510 shipments

Required:

(1) Determine the operating income on transactions related to Campa Equipment and Edith Refrigeration. **(10 points)**

(2) Based on (1), Whitewater is considering to drop the customer with the lower operating income. Upon further investigation, it is determined that 10% of the selling costs and 20% of the administrative costs would not be avoidable if Whitewater were to drop the least profitable customer. Should Whitewater drop the least profitable customer? Show your calculations. **(10 points)**

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