Problem 1 (50%) ※ 注意：請於試卷上「非選擇題作答區」內依序作答，並應註明作答之大題及其題號

Raptor Semicon, a manufacturer traditionally using weighted-average process costing for its chip-fabrication processes, keeps raw material inventories using FIFO. Recently, the company has begun accepting custom orders, necessitating job costing. Additionally, it is exploring the adoption of Activity-Based Costing (ABC) for more precise product-cost data. The CFO aims to evaluate the company's target operating income under different cost-pooling assumptions, especially considering the complexities of normal spoilage, abnormal spoilage, and rework costs.

April Operations for RS-1

Raptor Semicon's mass-produced "RS-1" chip is handled in the fabrication department, utilizing weighted-average process costing. The following details pertain to April operations:

- Beginning WIP (April 1): 2,000 units (100% materials, 50% conversion); total costs = $18,000 (materials $10,000; conversion $8,000).
- Units started: 10,000.
- Ending WIP (April 30): 1,500 units (100% materials, 40% conversion).
- Normal spoilage: 6% of good units passing the 60% inspection point, disposed of at $0 net disposal value.
- Abnormal spoilage: All spoilage beyond normal spoilage.
- Completed/transferred-out (good units): 9,100.
- Costs added during April: $75,000 (materials); $90,000 (conversion).

As Raptor Semicon shifts to more specialized custom orders, managers want to assess how total unit costs of custom chips are computed using job costing, factoring in normal spoilage, abnormal spoilage, and rework.

May Operations for Custom Job RSC-21

In May, Raptor Semicon conducted a custom job (#RSC-21) for a renowned F1 team. The operational details for this job are as follows:

- Chips started: 2,000 chips.
- Chips spoiled: 200 chips (normal spoilage = 5% of chips started; abnormal spoilage = excess over normal spoilage).
- Direct materials: $50,000.
- Direct labor: 1,000 hours at $40/hour = $40,000.
- Budgeted overhead rate (normal costing): $75 per direct labor-hour.
- Spoilage detection: Occurs at 75% completion.
- Disposal value per spoiled chip: $10.
- Rework costs:
  - 10 defective chips reworked.
  - Additional costs per chip: $300 (materials) + $200 (conversion, including $150 in overhead).
- Rework costs fully charged to Job #RSC-21.

June Operations and ABC Implementation

In June, the CFO implemented ABC for variable overhead allocation and created a budget to evaluate overhead variances. The budget and actual results are summarized below:

June Budget Setup for Job #RSC-21:

- Chips started: 2,500 chips.

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- Budgeted spoiled chips:
  - Normal spoilage: 5% of chips started.
  - Abnormal spoilage: 2% of chips started.
- Direct materials cost: $60,000.
- Direct labor hours: 1,200 at $42/hour.
- Variable overhead components:
  - Design & Engineering: 250 design-hours at $45/hour.
  - Testing & Inspection: 10 test batches at $220/batch.
  - Machine Setup: 3 setups at $180/setup.
  - General Factory Support: 600 direct labor-hours at $3/hour.
- Fixed overhead: $2,500,000 allocated across 20,000 direct labor-hours.

Actual Results for Job #RSC-21:

- Chips started: 2,000 chips.
- Chips spoiled: 200 chips (normal spoilage = 5%; abnormal spoilage = remainder).
- Direct materials used: $50,000.
- Direct labor: 1,000 hours at $40/hour.
- Rework costs:
  - 10 defective chips reworked.
  - Additional costs per chip: $300 (materials) + $200 (conversion, including $150 variable overhead in General Factory Support).
- The fixed overhead of $2,000,000 is allocated using direct labor-hours.
- Variable Overhead Cost Allocation (Based on ABC)

Activity Pool	Cost Driver	Total Cost	Driver Usage	Actual Usage Allocated to RSC-21
Design & Engineering	Design-hours	$200,000	5,000 hours	200 hours
Testing & Inspection	Test batches	$100,000	500 batches	8 batches
Machine Setup	Number of setups	$60,000	400 setups	2 setups
General Factory Support	Direct labor-hours	$40,000	20,000 hours	400 hours

July Operations

Both RS-1 and RSC-21 chips share the following details:

- Direct materials and labor per unit: $2.50 (materials); $40 (labor).
- Fixed overhead: $2,000,000.
- Variable overhead:
- Each chip—standard "RS-1" and custom "RSC-21" under ABC allocation:

Cost Driver	**Standard #RS-1**	**Custom #RSC-21**
Design-hours	20 hours	200 hours
Number of test batches	1 batch	8 batches
Number of setups	1 setup	2 setups
Direct labor-hours	800 DL-hrs	400 DL-hrs

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- Selling price: $30,000 for RS-1; $50,000 for RSC-21.
- Historical sales mix: 35% RSC-21; 65% RS-1.
- Target after-tax profit: $2,100,000 (corporate tax rate: 30%).

Required:

1. At the end of April, assign total costs (including spoilage) of RS-1 to (a) completed/transferred units and (b) abnormal spoilage. (Round cost per equivalent unit to the nearest cent.) (10%)
2. At the end of May, calculate the cost per good unit for RSC-21. (10%)
3. At the end of June, perform a monthly variable overhead variance analysis for RSC-21 (spending and efficiency variances). (20%)
4. Using a sales-mix approach, how many units of RS-1 and RSC-21 must be sold to achieve the target operating income in July? (Round to whole units.) (10%)

Problem 2 (20%)

Premier Resorts (PR) operates a five-star hotel, and it has a decentralized management structure, with three divisions:

- Lodging (rooms and villas, garden view access, and swimming pool)
- Dining (forest cafe and restaurants)
- Recreation (massage pavilion, balloon rides, elephants camp, and so on)

The services typically offered by each division of PR are outlined below.

Services	As Priced Separately
Two nights' stay for two in a mountain-view villa	$ 300 ($150 per night)
Candlelight dinner for two at PR's finest restaurant	$ 150 ($75 per person)
Classic balloon flights for two passengers	$ 760 ($380 per person)

In an effort to attract visitors, the resort will offer vacation packages as detailed below.

	Vacation Package			
Services	**Deluxe_A**	**Deluxe_B**	**Deluxe_C**	**Premium**
Two nights' stay for two in a mountain-view villa	Included	Included		Included
Candlelight dinner for two at PR's finest restaurant	Included		Included	Included
Classic balloon flights for two passengers		Included	Included	Included
Price charged to the customer for the package	$ 350	$ 900	$ 780	$ 1,000

Division managers asked the CEO of PR about how their respective divisions would share the revenues from the vacation packages. After consulting with industry professionals, the CEO is considering the allocation of revenue to each division as outlined below.

For Deluxe_A package:

(a) The Shapley value method

(b) The weighted Shapley value method, assuming that lodging is three times as likely to sell as the dining

For Premium package:

(c) The Shapley value method

Required:

(1) Determine the allocation for each division according to the packages and the methods outlined in (a), (b), and (c), respectively. (15%)

(2) If you were the manager of the Lodging division and the Shapley value method were applied for all packages, which package would you recommend to your customers in order to optimize your revenue allocation? Show your comparison. (5%)

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Problem 3 (30%)

A press release from the ABC City Government is adapted as follows:

Currently, there are 59 traditional or specialty commercial districts in the city. Recognizing the strong connection between these districts and the daily lives of residents, the city commission conducted a survey to gather public opinions on their development and management. The survey, conducted prior to the Lunar New Year, targeted individuals aged 18 and older.

The results revealed that 81% of respondents had visited the city's commercial districts at least once in the past year, with 53% visiting at least once a month. In response to the question about why they choose to make purchases at the commercial districts rather than through other distribution channels or online, 34% of the 877 respondents who visited the city's commercial districts at least once in the past year stated that they shop there because it is conveniently located. 32% cited the districts' unique food offerings or restaurants as their reason for visiting, while 17% appreciated the "one-stop convenience" of fulfilling their food, clothing, and leisure needs. Additionally, 16% visit for specific shopping needs, such as shoes, cameras, or wedding dresses, and 8% prefer shopping in physical stores.

The survey showed strong support for the districts' continued development. 57% of respondents agreed that the development of these areas does not negatively impact the quality of life, while 66% believed government intervention is necessary. When asked which aspects of the commercial district's development the government should prioritize, using a multiple-choice format without any prompts, 45% of respondents chose environmental sanitation and food safety. 32% emphasized the improvement of parking availability and traffic, 31% prioritized the pedestrian environment, and 10% believed that public facilities, such as toilets and lactation rooms, should be addressed first.

The survey also sought to learn about the satisfaction with public construction relating to infrastructure such as roads, the Metro Rapid Transit system, bike lanes, and pedestrian walkways. The results reveal that 45% of respondents are satisfied with the current state of public construction, while 33% are dissatisfied. Among the respondents who expressed dissatisfaction, multiple-choice questions revealed that 27% feel the construction progress is slow, 24% believe the planning is generally poor, and 16% are frustrated with potholes or uneven pavements.

The City Government acknowledges the public's concerns regarding various aspects of commercial districts, including environmental sanitation, food safety, parking, and pedestrian environmental quality. These concerns have been incorporated into the key tasks for improvement. To achieve its strategic goals, the City Government will utilize a strategy map and balanced scorecard to ensure that all commercial districts maintain pleasant, comfortable, and safe environments.

Required:

(1) How many respondents in this survey visited at least once a month? How many respondents, in total, express dissatisfaction with the current condition of public infrastructure? (Round your answers to the nearest integer) (10%)

(2) Create a strategy map describing the cause-and-effect relationships among the strategic objectives you would expect to see for the case. For each strategic objective, specify the metrics you would establish for its balanced scorecard. (Your strategy map and the balanced scorecard must be presented in English) (20%)

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