

# Solution

Management Accounting 2018-06-14

Exam ID 18061400001

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### 1. Problem

Which of the following costs is **relevant** in the decision to keep or replace an old equipment? (1 point)

- (a) Future depreciation of the new equipment.
- (b) Salvage value of the old equipment.
- (c) Future depreciation of the old equipment.
- (d) Past depreciation of the old equipment.

### Solution

In an equipment replacement decision, the relevant costs (and benefits) are: the market value of the old equipment (which can be earned if the equipment is replaced), the salvage value of the old equipment (which will not be earned if the equipment is replaced), the market value of the new equipment (which will be paid if the equipment is replaced), the salvage value of the new equipment (which can be earned if the equipment is replaced), and the change in related operating expenses. Book values and depreciation are always irrelevant.

In addition, is it important to consider non-financial factors affecting strategy (e.g. policy of vertical integration, control over quality), risks (e.g. the reliability of the supplier which depends on financial health and competence), and Corporate Social Responsibility (e.g. working conditions at the suppliers' factories).

- (a) False.
  - (b) True.
  - (c) False.
  - (d) False.
- 

### 2. Problem

A foreign customer recently approached Leia Kahlan, the Chief Marketing Officer of *Fashion Victim*, a company producing and selling clothes for men. This customer wants to buy 1,990 units of an improved version of *shirt*, one of the main products of the company. *shirt* is usually sold for €38.00 per unit and has a unit variable cost of €19.00.

The modifications requested by this potential customer would increase the unit variable cost by €2.09 and require some specific equipment, increasing the current fixed costs of €381,881.00 by an amount of €11,456.43. In addition, the customer is willing to pay a maximum price of €32.30 per unit.

Assuming that this special order would not impact normal sales and prices, what would be the **net economic impact** of accepting it? (2 points)

- (a) The profit would increase by €10,851.47
- (b) The profit would increase by €26,353.57
- (c) The profit would decrease by €15,010.57
- (d) The profit would decrease by €26,353.57

### Solution

Since normal sales are not affected, the economic net impact of the special order is its total contribution margin minus the increase in fixed costs it entails:

$$\begin{aligned} &+ \text{Contribution Margin earned on the special order} = +1,990 \times (32.30 - 21.09) \\ &- \text{Additional fixed costs} = -11,456.43 \\ &= \text{Net economic impact} = 10,851.47 \end{aligned}$$

- (a) True.
- (b) False.

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- (c) False.
- (d) False.

### 3. Problem

Julia Adams is the management accountant of *VegLover*, a company producing smoothies. Using cost estimation techniques, she has developed the following budgeted income statement for a volume of 115,800 smoothies produced and sold:

Contribution Income Statement (amounts)	Amounts
Revenues	1,227,480.00
Variable Costs	-736,488.00
Contribution Margin	490,992.00
Fixed Costs	-358,424.16
Operating Income	132,567.84

The company is experimenting with new engineering techniques to reduce variable cost to €5.96 per unit and significantly improve product quality. The innovations would increase fixed costs by €52,350.00, but sales would also increase by 1,560 units. If this strategy is pursued, what will be the **impact on budgeted operating income?** (2 points)

- (a) Budgeted operating income will *decrease* by €1,208.40
- (b) Budgeted operating income will *increase* by €1,208.40
- (c) Budgeted operating income will *decrease* by €5,406.00
- (d) Budgeted operating income will *increase* by €6,030.00

### Solution

The easiest way to solve this problem is to build the new profit equation, compute the new profit, and compute the difference. The new profit equation would be:

$$\begin{aligned}OI &= Q \times (P - V_{c,after}) - FC_{after} \\&= Q \times \left( \frac{R_{before}}{Q_{before}} - V_{c,after} \right) - (FC_{before} + FC_{increase}) \\&= Q \times \left( \frac{1,227,480.00}{115,800} - 5.96 \right) - (358,424.16 + 52,350.00) \\&= Q \times 4.64 - 410,774.16\end{aligned}$$

Substituting the new volume,  $115,800 + 1,560 = 117,360$ , to  $Q$  in this equation leads to a new profit of 133,776.24. The difference between the two profits is therefore  $133,776.24 - 132,567.84 = 1,208.40$ .

Another way to deal with this problem is to apply *differential analysis*, assessing successively the impact of each change as if they were occurring one and after the other. By convention, start by assessing the impact of a change in volume, then the impact of a change in contribution margin (price and unit variable cost), and finally the impact of changes in fixed costs:

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$$\begin{aligned} \text{Impact of a change in } Q &= \Delta Q \times UCM_{\text{before}} = (Q_{\text{after}} - Q_{\text{before}}) \times UCM_{\text{before}} \\ &+ \\ \text{Impact of a change in } UCM &= Q_{\text{after}} \times \Delta UCM = Q_{\text{after}} \times (UCM_{\text{after}} - UCM_{\text{before}}) \\ &+ \\ \text{Impact of a change in } FC &= -\Delta FC = -(FC_{\text{after}} - FC_{\text{before}}) \\ &= \\ \text{Change in OI} \end{aligned}$$

Applying these formulas, you get:

$$\begin{aligned} \text{Impact } \Delta Q &= (117,360 - 115,800) \times 4.24 = 6,614.40 \\ &+ \\ \text{Impact } \Delta UCM &= 117,360 \times 0.40 = 46,944.00 \\ &- \\ \text{Impact } \Delta FC &= 52,350 \\ &= \\ &1,208.40 \end{aligned}$$

- (a) False.
  - (b) True.
  - (c) False.
  - (d) False.
- 

#### 4. Problem

Select the **correct** statement: (1 point)

- (a) Relevant costs or revenues must not differ between the alternatives being considered.
- (b) Opportunity costs are never relevant to decision making.
- (c) Relevant costs are only those that are based on past experience.
- (d) Unavoidable costs are never relevant to decision making.

#### Solution

Relevant costs are either costs which may or may not be incurred depending on the alternative chosen (avoidable costs) or the benefits sacrificed when one alternative is chosen over another (opportunity cost). Irrelevant costs are either cost incurred in the past which are not affected by the decision (sunk costs) or costs not yet incurred but which are not affected by the decision (unavoidable costs).

Depending on the decision which has to be made, different sets of costs may be relevant or irrelevant. Whether they are variable, fixed, direct or indirect, product or period costs does not matter. A cost is relevant if it relates to a future cash flow which is affected by the decision.

- (a) False.
  - (b) False.
  - (c) False.
  - (d) True.
-

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### 5. Problem

When a production manager considers replacing an old equipment with a new one, what kind of cost is the depreciation of the old equipment, **from a decision making perspective**? (1 point)

- (a) A direct cost.
- (b) A variable cost.
- (c) A sunk cost.
- (d) A fixed cost.

### Solution

Book values and depreciation relate to cash flows which occurred in the past. They are therefore always sunk costs. The current market value of the old equipment could be earned now if the equipment were replaced, and its salvage value could be earned later if the equipment were not replaced. Therefore, they are both opportunity cost but of different alternatives.

The current market value of the new equipment is a cost which could be avoided if the old equipment were not replaced, so it is an avoidable cost. If there is no replacement however, its salvage value would not be earned, so it is an opportunity cost of not replacing the old equipment.

Operating costs are avoidable costs: the operating costs of the old equipment can be avoided by replacing it while the operating costs of the new equipment could be avoided by keeping the old one.

Finally, the wage of the production managers would be incurred in either scenario. It is therefore unavoidable. All other cost classifications (direct or indirect, variable or fixed) are not appropriate from a decision making perspective.

- (a) False.
- (b) False.
- (c) True.
- (d) False.

### 6. Problem

Quentin Lichterman, the Chief Operating Officer of a company producing and selling cell phones, is considering the replacement of some of its equipment of production. He gathered the following information to make this decision:

Information	Old equipment	New equipment
Cost of the equipment (in euros)	896,768.00	929,847.00
Operating expenses (over the useful life; in euros)	6,533,800.00	6,429,800.00
Salvage value (at the end of the useful life; in euros)	161,713.00	591,721.00
Market value (in euros)	364,588.00	
Current book value (in euros)	455,735.00	
Remaining useful life (years)	2	2

What would be the **total net economic impact** over the next 2 years of replacing the equipment? (3 points)

- (a) The profit would increase by €31,251.00
- (b) The profit would decrease by €61,199.00
- (c) The profit would decrease by €83,251.00
- (d) The profit would decrease by €31,251.00

### Solution

The net economic impact of replacing an old equipment is the sum of all the future cash flows affected by this decision:

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$$\begin{aligned} & + \text{Market value of the old equipment} = +364,588.00 \\ & - \text{Salvage value of the old equipment} = -161,713.00 \\ & - \text{Market value of the new equipment} = -929,847.00 \\ & + \text{Salvage value of the new equipment} = +591,721.00 \\ & + \text{Savings on old operating expenses (over the useful life)} = +6,533,800.00 \\ & + \text{New operating expenses (over the useful life)} = -6,429,800.00 \\ \\ & = \text{Net economic impact} = -31,251.00 \end{aligned}$$

- (a) False.
- (b) False.
- (c) False.
- (d) True.

### 7. Problem

Robert Eliasoph is the Chief Executive Officer of Fashion Victim, a company which produces and sells clothes for men. The division in charge of the product *sweater* is currently suffering a loss displayed in the 2017 financial income statement (for a total volume of 21,853 units produced and sold):

Detailed Income Statement	Total amount
Revenues	382,427.50
Direct materials costs (variable)	-67,744.30
Direct labor wages (variable)	-39,335.40
Depreciation of the productive equipment (fixed) (1)	-128,419.20
Gross Margin	146,928.60
Selling expenses (variable)	-45,891.30
Division administrative expenses (fixed) (2)	-55,036.80
Headquarters management fee (fixed) (3)	-69,460.76
Operating Income	-23,460.26

(1) The productive equipment was bought 4 years ago for €642,096.00. Its estimated useful life was 5 years and its salvage value is null. The current book value of the equipment is €128,419.20 and its current market value is €51,367.68.

(2) Division administrative costs include the rent of administrative offices and the wages of administrative personnel dedicated to the division. Both the lease and the employment contracts can be terminated without notice.

(3) Headquarters' management fee is the share of headquarters' costs allocated to the division.

What would be the **net economic impact** of closing the division? (3 points)

- (a) The profit would decrease by €123,052.02
- (b) The profit would increase by €146,928.60
- (c) The profit would decrease by €146,928.60
- (d) The profit would decrease by €229,456.50

### Solution

Dropping the division in charge of *sweater* would lead first to the loss of the contribution margin made by the division:  $382,427.50 - 67,744.30 - 39,335.40 - 45,891.30 = 229,456.50$ .

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The fixed costs incurred by the division also deserve some attention. Depreciation is a sunk cost as the expense occurred in the past, when the productive equipment was bought. The same is true for its book value. However, the market value of this equipment is a future cash flow affected by the decision, as it could be earned if the division is closed and the equipment sold. As for the division administrative expenses, they can all be avoided if the division is closed.

Finally, the headquarters' management fee is not a direct cost of the division, but a cost of the headquarters which is allocated to the division. You must therefore assume that the corresponding costs, incurred at headquarter level, will not be saved if the division is closed. The net impact of dropping the division is therefore:

$$\begin{aligned} &+ \text{Contribution Margin lost} = -229,456.50 \\ &- \text{Market value of the productive equipment} = +51,367.68 \\ &- \text{Savings on division administrative expenses} = +55,036.80 \\ &= \text{Net economic impact} = -123,052.02 \end{aligned}$$

- (a) True.
  - (b) False.
  - (c) False.
  - (d) False.
- 

### 8. Problem

Anastasia Grey, the Chief Operating Officer (COO) of *CoffeeDrop*, a medium-sized company producing bags of coffee, considers re-engineering the production process to make it more efficient. She has found a supplier able to make some of the components of one product at the same level of quality and for the same total cost. At the current volume of activity, the higher cost per unit paid by the company would thus be compensated by equal savings on fixed costs. Should Anastasia **outsource** the production of the component? (2 points)

- (a) No, the company should keep the production because it produces at a lower unit variable cost.
- (b) Yes, the company should outsource because it would save on fixed costs.
- (c) The company should outsource only if the demand for the product decreases.
- (d) The company should outsource only if the demand for the product increases.

### Solution

For a given volume, price, and unit variable cost, when the cost structure is relatively more fixed, the operating leverage is greater, i.e. the profit is more sensitive to a change in revenue. For a given increase in revenues, the profit will grow faster when the cost structure is more fixed; for a given decrease in revenues, the profit will drop faster when the cost structure is more fixed. The company should therefore outsource only if the demand decreases.

- (a) False.
  - (b) False.
  - (c) True.
  - (d) False.
-



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### 9. Problem

*Tropical Sunset* produces and sells three different kinds of cocktails: Mojito, Cuba Libre, and Zombie. The unit contribution margin of each product is respectively €3.07, €9.06, and €8.64. As for the consumption of resources per unit, they are given by the following table:

Resources	Mojito	Cuba Libre	Zombie
fruits (in grams)	183.00	85.00	81.00
rum (in centiliters)	6.00	16.00	7.30
preparation (in labor minutes)	2.40	2.70	3.60
mixing (in machine minutes)	2.90	3.90	3.40

Select the **correct** statement: (2 points)

- (a) Depending on the resource constraining capacity, the priority assigned to the product *Mojito* changes.
- (b) If capacity is constrained by preparation, then the product *Mojito* is second in order of priority.
- (c) If capacity is constrained by rum, then the product *Mojito* is first in order of priority.
- (d) Depending on the resource constraining capacity, the priority assigned to the product *Cuba Libre* changes.

### Solution

To establish priorities in capacity allocation, you need to compute the contribution per unit of each constrained resource:

Contributions	Mojito	Cuba Libre	Zombie
euro per unit	3.07	9.06	8.64
euro per grams of fruits	0.02	0.11	0.11
euro per centiliters of rum	0.51	0.57	1.18
euro per labor minutes for preparation	1.28	3.36	2.40
euro per machine minutes for mixing	1.06	2.32	2.54

You should then sell in priority the products with the highest contribution per unit of available resource.

- (a) False.
- (b) False.
- (c) False.
- (d) True.

### 10. Problem

*ClearWater* has a contribution margin ratio of 70.00%. The Chief Marketing Officer has to decide whether the company should invest in an advertising campaign. This campaign would cost €43,492.34 and bring the total fixed cost of the company to €763,365.62. Now, this campaign would also boost revenues, which would reach €1,499,736.00 instead of the €1,428,320.00 initially planned. What would be the **net economic impact** of this advertising campaign? (1 point)

- (a) Operating income would not change.
- (b) Operating income would *increase* by €49,991.20
- (c) Operating income would *increase* by €22,067.54
- (d) Operating income would *increase* by €6,498.86

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### Solution

The increase in profit is the increase in revenues multiplied by the contribution margin ratio, minus the increase in fixed costs:

$$\Delta OI = (1,499,736.00 - 1,428,320.00) \times 70.00\% - 43,492.34 = 6,498.86$$

- (a) False.
  - (b) False.
  - (c) False.
  - (d) True.
- 

### 11. Problem

Which of the following accounts would appear **both on the sales budget and on the pro-forma cash flow statement**? (1 point)

- (a) Equity.
- (b) Accounts payable.
- (c) Cash receipts.
- (d) Cash payments.

### Solution

In the sales budget, revenues go to the pro-forma income statement, accounts receivable go to the pro-forma balance sheet, and cash receipts go to the cash flow statement.

In the inventory, production, and purchase budget, accounts payable go to the pro-forma balance sheet, and cash payments go to the cash flow statement.

- (a) False.
  - (b) False.
  - (c) True.
  - (d) False.
- 

### 12. Problem

What is the **correct** order in which the following outputs of the budgeting process are prepared: (1 point)

- (a) administrative budget, inventory and purchase budget, pro-forma financial statements, cash budget, inventory and production budget.
- (b) administrative budget, cash budget, pro-forma financial statements, inventory and purchase budget, inventory and production budget.
- (c) sales budget, inventory and production budget, inventory and purchase budget, administrative budget, cash budget, pro-forma financial statements.
- (d) inventory and production budget, administrative budget, cash budget, pro-forma financial statements, inventory and purchase budget.

### Solution

Budgets always start with sales, which drive production (based on available and desired levels of inventory of finished products), which drives purchases (based on available and desired levels of inventory of raw materials). The administrative budget is then necessary to establish a cash budget, and once financing decisions have been made, management accountants can finally build pro-forma financial statements.

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- (a) False.
  - (b) False.
  - (c) True.
  - (d) False.
- 

### 13. Problem

In the budget for next year, and more specifically for the month of May, the company *Fwatch* plans to buy for €432,900.00 of raw materials. It also intends to start this month with €121,278.60 worth of inventory and to end it with an inventory value of €47,619.00. What is the **value of the raw materials the company plans to consume** in May 2019? (2 points)

- (a) €506,559.60
- (b) €359,240.40
- (c) €455,903.64
- (d) €557,215.56

### Solution

What is already there at the beginning, plus what you add through purchase, minus what goes out because you consume it leads to what is left in the end. This simple idea is translated by the following equation:

$$\text{Inventory, beginning} + \text{purchases} = \text{consumption} + \text{Inventory, ending}$$

Using the preceding equality, you obtain:

$$\begin{aligned}\text{Consumption} &= \text{Inventory, beginning} + \text{purchases} - \text{Inventory, ending} \\ &= 121,278.60 + 432,900.00 - 47,619.00 \\ &= 506,559.60\end{aligned}$$

- (a) True.
  - (b) False.
  - (c) False.
  - (d) False.
- 

### 14. Problem

The management accountant of *DanVelft* has estimated the following sales volumes for next year:

Sales	June	July	August	September
volumes	2,700	2,850	2,150	2,350

The company typically sells each unit for a price of €5.10. Moreover, 45.00% of the revenues earned any given month are collected during the following month. The other 55.00% are collected in the month of the sale itself. What is the **total amount of cash receipts in September**? (2 points)

- (a) €6,591.75
- (b) €11,985.00
- (c) €4,934.25
- (d) €11,526.00

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### Solution

In September, the company will receive 45.00% from the previous month revenue and 55.00% of the current month revenue:

From previous month:  $+ 5.10 \times 2,150 \times 45.00\%$

From current month:  $+ 5.10 \times 2,350 \times 55.00\%$

Total cash receipts = 11,526.00

- (a) False. This is the cash sales of the month.
  - (b) False. This is the revenues.
  - (c) False. This is the cash collected from previous periods
  - (d) True.
- 

### 15. Problem

Louise Eliasoph is the management accountant of *DanVelft*. She is currently working on the Selling, General, and Administrative (SG&A) budget for next year. Sales volumes are expected to 136,315 bags of peppernoten in September 2019 and 167,830 bags in October 2019. The unit price should be €10.00 and advertising expenses should amount to €5,230.00 each month.

In addition to the unit production costs, each unit sold costs an additional €0.20 paid to a service provider for delivery, and an additional €0.50 of commission for the sales people. The other monthly administrative cost are the following:

- depreciation on administrative offices, €15,690.00;
- maintenance of administrative offices, €10,460.00;
- wages of administrative personnel, €26,150.00.

Personnel expenses (i.e. wages and commissions) are typically paid the month in which they are incurred. For all the other expenses, 70.00% are paid in the month in which they are incurred, and the rest is paid one month later.

What is the amount recorded in **accounts payable at the end of September** for SG&A expenses? (2 points)

- (a) €175,011.00
- (b) €12,885.90
- (c) €144,544.20
- (d) €17,592.90

### Solution

First, you can ignore depreciation as it is not a cash expense (or rather, the cash outflow happens when the asset was purchased). The account receivable are then equal to all the expenses of September which will be paid in the following month: 30.00% of the shipping, advertising, and rent expenses:

$$\begin{aligned} \text{Shipping, advertising, and rent on account: } &+ 30.00\% \times (136,315 \times 0.20 + 5,230.00 + 10,460.00) \\ &= 12,885.90 \end{aligned}$$

- (a) False.
- (b) True.
- (c) False.
- (d) False.

16. Problem

Olivier Lichterman works as management accountant for the company *Tropical Sunset* which produces and sells cocktails. He gathered the following information about budgeted and actual volumes, usages, and prices:

Assumptions	Budget	Actual
volume	1,310.00	1,158.00
price	5.90	6.72
fruits (grams per unit)	101.00	84.00
preparation (labor minutes per unit)	2.90	3.80
fruits (euro per kilogram)	10.50	10.50
preparation (euro per hour)	31.30	35.80

What is the **labor price variance**? (2 points)

- (a) €373.35 (F)
- (b) €330.03 (F)
- (c) €330.03 (U)
- (d) €284.92 (U)

**Solution**

The labor price variance is given by the following formula:

$$\begin{aligned}\text{Labor price variance} &= Q_A \times LU_A \times (LP_A - LP_B) \\ &= 1,158 \times 3.80 \times (35.80 - 31.30)/60 \\ &= 330.03(U)\end{aligned}$$

Note that you might have to convert the units when usages are not expressed in the same unit as prices (e.g. usage in minutes and price per hour).

- (a) False.
  - (b) False.
  - (c) True.
  - (d) False.
- 

17. Problem

Select the **incorrect** statement: (1 point)

- (a) Budget and flexible budget make a different assumption about material usage.
- (b) All the differences between budget and flexible budget can be attributed to a different sales volume.
- (c) Budget and flexible budget rely on the same values for selling prices.
- (d) The flexible budget uses actual volumes.

**Solution**

The only difference between budget and the flexible budget is that the latter used actual instead of budgeted sales volumes. All the other assumptions (usages, prices) are the same. It follows that the difference between flexible budget and budget can be fully attributed to the volume, and the volume only, while all the differences between the actual and the flexible budget cannot be attributed to the volume, but to any of the other assumptions.

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- (a) True.
  - (b) False.
  - (c) False.
  - (d) False.
- 

### 18. Problem

Robert Kahlan works as management accountant for the company *SolarBucks* which produces and sells cups of coffee. He gathered the following information about budgeted and actual volumes, usages, and prices:

Assumptions	Budget	Actual
volume	172,200.00	191,060.00
price	8.00	8.40
coffee beans (grams per unit)	59.50	62.50
preparation (labor minutes per unit)	3.60	3.40
coffee beans (euro per kilogram)	44.00	43.50
preparation (euro per hour)	24.20	19.70

What is the **material usage variance**? (2 points)

- (a) €22,472.10 (F)
- (b) €22,730.40 (F)
- (c) €25,219.92 (F)
- (d) €25,219.92 (U)

### Solution

The material usage variance is given by the following formula:

$$\begin{aligned}\text{Material usage variance} &= Q_A \times (MU_A - MU_B) \times MP_B \\ &= 191,060 \times (62.50 - 59.50) \times 44.00/1000 \\ &= 25,219.92(U)\end{aligned}$$

Note that you might have to convert the units when usages are not expressed in the same unit as prices (e.g. usage in grams and price per kilogram).

- (a) False.
  - (b) False.
  - (c) False.
  - (d) True.
- 

### 19. Problem

*DoLunch* buys lunch boxes from foreign suppliers and sells them on the local market. Last year, the sales people of the company budgeted a volume of 127,600 boxes sold for the month of May. They also expected to sell these boxes for a unit price of €32.00. The actual volume was 131,180 and the actual selling price was €30.60.

The purchasers of the company bought each box €9, instead of the €19.20 initially budgeted. Finally,

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Selling, General and Administrative expenses (all fixed costs) amounted to €1,059,735.52, below the €1,192,294.40 recorded in the budget.

What is the **total volume variance**? (2 points)

- (a) €40,812.00 (F)
- (b) €45,824.00 (U)
- (c) €77,328.00 (F)
- (d) €45,824.00 (F)

### Solution

The volume variance is the change in volume times the budgeted unit contribution margin. Fixed costs can be ignored as by definition they are not affected by the volume.

$$\begin{aligned}\text{Volume variance} &= (Q_A - Q_B) \times (P_B - V_{cB}) \\ &= (131,180 - 127,600) \times (32.00 - 19.20) \\ &= 45,824.00(F)\end{aligned}$$

- (a) False.
- (b) False.
- (c) False.
- (d) True.

### 20. Problem

Han Lichterman works as management accountant for the company *SolarBucks* which produces and sells cups of coffee. He communicated the following table about all variances observed last month:

Variances	Amounts	Impact
Volume variance	27.96	Favorable
Selling price variance	417.60	Unfavorable
Material usage variance	74.39	Favorable
Material price variance	10.35	Unfavorable
Labor usage variance	14.33	Favorable
Labor price variance	15.95	Unfavorable

Which **interpretation is the most consistent** with the variances displayed in this table? (2 points)

- (a) The actual profit is higher than budget. The main reason for this might be bad market conditions.
- (b) The actual profit is lower than budget. The main reason for this might be a larger market.
- (c) The actual profit is lower than budget. This might be due mainly to a decrease in selling prices.
- (d) The actual profit is higher than budget. This might be due mainly to a decrease in selling prices.

### Solution

The first step is to determine whether profit increased or decreased. Adding all the favorable variances and subtracting all the unfavorable variances, you obtain a total static budget variance of €327.23 (U). Therefore, the actual profit is lower than budget.

Then, you need to identify the largest variance consistent with the overall change in profit:

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Variances	Amounts	Impact
Selling price variance	417.60	Unfavorable

- (a) False.
  - (b) False.
  - (c) True.
  - (d) False.
- 

### 21. Problem

Select the **correct** statement: (2 points)

- (a) The Residual Income is always positive when the Return On Investment is greater than the Desired Rate of Return.
- (b) Rewards based on Residual Income may give managers an incentive to reject investments which would create value.
- (c) Residual Income is used to measure the performance of profit centers.
- (d) When you add the Return On Investment of all the divisions of a company, you get the Return On Investment of the whole company.

### Solution

Both Return in Investment (ROI) and Residual Income (RI) are used to evaluate Investment Centers. They have however different behavioral consequences. Since ROI scales all returns (it gives the return for every euro invested in operations), it facilitates comparisons between entities of very different sizes. However, it also leads to harmful consequences. If managers are rewarded based on ROI, they have an incentive to invest only in the assets with the highest ROI. They will therefore not invest in assets the return on which is above the desired rate of return (i.e. they create value) but below the ROI of their own division. Therefore, the interest of the manager is not aligned with the interest of the company. RI avoids this caveat, but makes the comparison between division of different size a bit less straightforward.

- (a) True.
  - (b) False.
  - (c) False.
  - (d) False.
- 

### 22. Problem

*Paddle* is a company specialized in the commercialization of tablets. It is organized in three product divisions: *T-16G* (ROI = 13.60%), *T-32G* (ROI = 16.30%), and *T-64G* (ROI = 7.90%). Division managers earn a bonus proportional to the Return On Investment of their division.

To implement its expansion strategy, headquarters has recently called for investment proposals, committing to finance any project the ROI of which exceeds the Desired Rate of Return of 12.00%.

The best project of the division *T-16G* would have a ROI of 10.00%. The ROI of the best project of the division *T-32G* is 8.40%. Finally, the investment the division *T-64G* could make would have a return of 16.80%.

Assuming division managers only submit proposals which are likely to be accepted and benefit them, which of the following scenario is the **most likely** to occur: (2 points)

- (a) The division **T-16G** will **submit** a proposal because it **would be approved**. The division **T-32G** will **not submit** a proposal because it **would be rejected**. The division **T-64G** will **not submit** a proposal because it **would be approved**.



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- (b) The division **T-16G** will **submit** a proposal because it **would be approved**. The division **T-32G** will **not submit** a proposal because it **would be approved**. The division **T-64G** will **not submit** a proposal because it **would be approved**.
- (c) The division **T-16G** will **not submit** a proposal because it **would be rejected**. The division **T-32G** will **not submit** a proposal because it **would be rejected**. The division **T-64G** will **not submit** a proposal because it **would be approved**.
- (d) The division **T-16G** will **not submit** a proposal because it **would be rejected**. The division **T-32G** will **not submit** a proposal because it **would be rejected**. The division **T-64G** will **submit** a proposal because it **would be approved**.

### Solution

A division manager would only send an investment proposal if the project has a ROI superior to both the ROI of the division and the Desired Rate of Return. The proposal would then be approved. If the project ROI is below the division ROI, it would hurt the manager even if it benefits the company, and the proposal would never be sent to headquarters. If the project ROI is inferior to the Desired Rate of Return, it would not be sent in anticipation of a rejection.

- (a) False.
  - (b) False.
  - (c) False.
  - (d) True.
- 

### 23. Problem

Julia Adams is in charge of the administrative support in an organization. Following the principles of responsibility accounting, **what kind or responsibility center** does Julia manage? (1 point)

- (a) A profit center
- (b) An investment center.
- (c) A revenue center.
- (d) A discretionary cost center.

### Solution

In **revenues centers**, managers typically focus on generating revenues. Depending on the extent of decentralization, they might be held accountable for volumes, revenues, commercial margin (revenues minus selling expenses), and even the cost of financing accounts receivable. Their accountability is however rarely extended beyond that.

In **standard cost centers** managers focus on the cost of production in settings where the relationship between input and output is well known. This typically means at the minimum material and labor usages. If they also decide the level of production, they have a direct impact on inventory level, and should therefore be held accountable for it. Finally, when they also handle procurement and recruitment, they may also be held accountable for material price, labor prices, and the amount of accounts payable resulting from credit terms with suppliers.

For **discretionary cost centers**, the relationship between input (what is invested or expended) and output (the return) is unclear. The managers of these financial responsibility centers can therefore not be assessed reliably using output metrics. The best they can be required to do is to respect the budget. Overspending might indeed lead to cash issues.

**Profit centers** managers manage both operating revenues and operating costs, allowing them to make trade-offs like accepting higher costs because it leads to a greater increase in revenues. Accordingly, they are typically evaluated using a controllable profit.

Finally, **investment centers** managers have control not only over operating revenues and operating costs (so they can make the same trade-offs as profit centers managers), but also on investments. Therefore, they

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decide not only about how to make the best possible use of available capacity, they also decide the level of this capacity. Accordingly, they are typically evaluated using return on investment, residual income, or economic value added. That way, they are not tempted to increase profit by acquiring profitable, yet insufficiently profitable, assets.

- (a) False.
  - (b) False.
  - (c) False.
  - (d) True.
- 

### 24. Problem

Following the principles of responsibility accounting, **what kind of responsibility center** would typically be evaluated based on **spending the amount budgeted, and not more than this amount?** (1 point)

- (a) A standard cost center.
- (b) A profit center.
- (c) An investment center.
- (d) A discretionary cost center.

### Solution

In **revenues centers**, managers typically focus on generating revenues. Depending on the extent of decentralization, they might be held accountable for volumes, revenues, commercial margin (revenues minus selling expenses), and even the cost of financing accounts receivable. Their accountability is however rarely extended beyond that.

In **standard cost centers** managers focus on the cost of production in settings where the relationship between input and output is well known. This typically means at the minimum material and labor usages. If they also decide the level of production, they have a direct impact on inventory level, and should therefore be held accountable for it. Finally, when they also handle procurement and recruitment, they may also be held accountable for material price, labor prices, and the amount of accounts payable resulting from credit terms with suppliers.

For **discretionary cost centers**, the relationship between input (what is invested or expended) and output (the return) is unclear. The managers of these financial responsibility centers can therefore not be assessed reliably using output metrics. The best they can be required to do is to respect the budget. Overspending might indeed lead to cash issues.

**Profit centers** managers manage both operating revenues and operating costs, allowing them to make trade-offs like accepting higher costs because it leads to a greater increase in revenues. Accordingly, they are typically evaluated using a controllable profit.

Finally, **investment centers** managers have control not only over operating revenues and operating costs (so they can make the same trade-offs as profit centers managers), but also on investments. Therefore, they decide not only about how to make the best possible use of available capacity, they also decide the level of this capacity. Accordingly, they are typically evaluated using return on investment, residual income, or economic value added. That way, they are not tempted to increase profit by acquiring profitable, yet insufficiently profitable, assets.

- (a) False.
  - (b) False.
  - (c) False.
  - (d) True.
-

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### 25. Problem

A strategic plan is usually set for: (1 point)

- (a) 1 year.
- (b) 1 month.
- (c) The useful life of an asset.
- (d) 5 to 10 years.

### Solution

Strategic planning is concerned with long-term (5 years or more) orientations and decisions affecting the whole company. Capital budgeting is concerned with investment decisions, i.e. the cash flow generated by specific assets over their useful life. Operations budgeting builds detailed pro-forma financial statement for the next year of activity.

- (a) False.
  - (b) False.
  - (c) False.
  - (d) True.
- 

### 26. Problem

A sales manager has authority to negotiate both prices and credit terms with customers, and as a budget for selling expenses. This manager is evaluated and rewarded based on operating income (all the operating income, and only the operating income). Which principle(s) of responsibility accounting is not respected? (1 point)

- (a) Both the principle of accountability and the principle of controllability.
- (b) Principle of justice.
- (c) Principle of prudence.
- (d) Principle of accountability.

### Solution

To make sure that managers care about all the consequences of their decisions, they must be held accountable for them. In other words, they should ideally be rewarded for all the good consequences, and sanctioned for all the bad consequences of their decisions.

However, it is important not to fall in the other extreme, where managers are held accountable not only for what they control, but also for what they do not. This would mean rewarding luck, and sanctioning a lack thereof. This is why the controllability principle states that managers should be held accountable only for what they control.

If an evaluation system follows these principles and is well designed, in theory it should lead to goal congruence, i.e. managers will make decisions which benefit both the organization and themselves. It should be noted that if there is a conflict of interest because of the evaluation system, the responsibility of bad decisions falls upon the designers of the evaluation system, not the managers themselves.

- (a) True.
  - (b) False.
  - (c) False.
  - (d) False.
-

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### 27. Problem

Olivier Menchik manages a subsidiary of a large company producing backpacks. He has complete authority over prices, credit terms (with customers and suppliers), production, purchases, R&D and administrative expenses, as well as productive investments. However, he does not make financing decisions. These decisions are made by the group.

Last year, the net income of the subsidiary was €21,709.77. Earnings before taxes were 24,393.00, and the operating income was €28,718.00.

The assets are made of:

- €14,710.00 in cash (just what is needed for operations);
- €62,280.00 in accounts receivable;
- €30,270.00 in inventory;
- €65,740.00 in long term operating assets; and
- €13,840.00 in non-operating assets.

Knowing that the group desired rate of return is 12.00%, what is the residual income of the subsidiary managed by Olivier? (2 points)

- (a) €8,594.64
- (b) €6,048.08
- (c) €7,958.00
- (d) €949.77

### Solution

The Residual Income is given by the following equation:

$$\text{Residual Income (RI)} = \text{Operating Income (OI)} - \text{Operating Assets (OA)} \times \text{Desired Rate of Return (DRR)}$$

Operating assets are the sum of all the assets, except those identified as “non-operating”:  $OA = 14,710.00 + 62,280.00 + 30,270.00 + 65,740.00 = 173,000.00$ . This leads to the following result:

$$RI = 28,718.00 - 173,000.00 \times 0.12 = 7,958.00\%$$

- (a) False.
  - (b) False.
  - (c) True.
  - (d) False.
- 

### 28. Problem

Leia Adams and George Clawson are both profit center managers in the company *Cost-Eau inc.*. The following table displays their respective income statements:

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Account	BU of Leia Adams	BU of George Clawson
Revenues	666,000	610,500
Cost of Goods Sold	-333,000	-305,250
Gross Margin	333,000	305,250
Shipping costs	-13,320	-11,100
Sales commissions	-33,300	-27,750
Advertising	-23,480	-18,784
Rent of BU offices	-70,440	-56,352
HQ management fees	-46,960	-37,568
Administrative wages	-117,400	-140,880
Operating Income	28,100	12,816
Interest expense	-11,844	-4,068
Earnings before taxes	16,256	8,748
Taxes	-3,251	-1,750
Net Income	13,005	6,998

Both managers have full authority over prices. They control production and procurement, and they also manage their own personnel. They can also choose where their offices are located. The only costs above the operating income that they do not control, are advertising expenses and headquarters (HQ) management fees which are decided by the division manager, Benedict Menchik. Leia and George do not make investment and financing decisions either, and credit terms are set by the group.

Following the principles of responsibility accounting, what **profit base** would you recommend using to compare and evaluate the performance of these two profit center managers? (2 points)

- (a) €16,256.00 for Leia and €8,748.00 for George.
- (b) €51,580.00 for Leia and €31,600.00 for George.
- (c) €75,060.00 for Leia and €50,384.00 for George.
- (d) €98,540.00 for Leia and €69,168.00 for George.

### Solution

Managers should held accountable for what they control, and only what they control. Therefore, all revenues and costs above the operating income, *except the HQ management fee*, should be included in their profit base (or controllable profit). They also have little to no control over assets (except perhaps inventory), debt, and the country in which they operate, so financing costs and taxes should be disregarded. A good profit base would therefore be the operating income in which you reintegrate the (uncontrollable) advertising expenses and HQ management fee:

$$\begin{aligned}\text{Profit base}_{\text{Leia}} &= 28,100.00 + 23,480.00 + 46,960.00 = 98,540.00 \\ \text{Profit base}_{\text{George}} &= 12,816.00 + 18,784.00 + 37,568.00 = 69,168.00\end{aligned}$$

- (a) False.
- (b) False.
- (c) False.
- (d) True.

### 29. Problem

A manager is in charge of managing the production in a factory. However, she has no authority over the volume of production, which is set by the demand for the product, or the procurement of raw materials which is handled by another department. Over what kind of **financial responsibility center** does this manager have authority? (1 point)

- (a) A profit center
- (b) A standard cost center.

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- (c) A call center.
- (d) An investment center.

### Solution

In **revenues centers**, managers typically focus on generating revenues. Depending on the extent of decentralization, they might be held accountable for volumes, revenues, commercial margin (revenues minus selling expenses), and even the cost of financing accounts receivable. Their accountability is however rarely extended beyond that.

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For **discretionary cost centers**, the relationship between input (what is invested or expended) and output (the return) is unclear. The managers of these financial responsibility centers can therefore not be assessed reliably using output metrics. The best they can be required to do is to respect the budget. Overspending might indeed lead to cash issues.

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- (a) False.
- (b) True.
- (c) False.
- (d) False.

---

### 30. Problem

Amber Skywalker manages the product *Liberica* for *CoffeeDrop*, a company specialized in the production of bags of coffee. She investigates the possibility of customizing this product for some of the company's clients. Such a customization would increase the current unit variable cost of €11.80 by €3.54. It would also require additional equipment, increasing fixed costs by an amount of €5,551.00. Now, a market study revealed that customers benefiting from such a customization would accept paying a price of €36.58, instead of the current price of €29.50.

What would be the **net economic impact** of customizing 2,240 units instead of selling them as they are? (2 points)

- (a) The profit would decrease by €5,551.00
- (b) The profit would decrease by €231,317.48
- (c) The profit would increase by €73,405.16
- (d) The profit would increase by €2,378.60

### Solution

For every unit customized, the change in unit contribution margin is given by the increase in price minus the increase in unit variable cost:  $(36.58 - 29.50) - 3.54 = 3.54$ . This variation in unit contribution margin is

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earned (or lost) on each one of the 2,240 units customized. Note that the initial price and variable costs are irrelevant as they are incurred anyway. Therefore, they should not be taken into account. Adding the impact of the increase in fixed costs, the net economic impact of processing further is:

$$+ \text{Additional contribution margin} = +7,929.60$$

$$- \text{Additional fixed costs} = -5,551.00$$

$$= \text{Net economic impact} = 2,378.60$$

- (a) False.
  - (b) False.
  - (c) False.
  - (d) True.
-