**University of Groningen**

**Faculty of Science and Engineering**

**Industrial Engineering and Management**

**Exam Management Accounting**

**WPIE18004**

**Date: 06-07-2020**

**Instructions:**

Keep the Nestor chat open during the exam. Here additional announcements will be made.

This exam is an open book exam to be completed at home. This means that you are allowed to use the course textbook to assist you to provide the solutions of the exam. However, there are several restrictions that you need to adhere to. You need to complete this exam individually, without consulting others. You cannot consult any other sources. including the internet. You will need to complete the student pledge. Make sure you do so before commencing the exam. An exam without pledge will not be marked, and result in a failure to complete the course. Your answers will be checked by the Ephorus plagiarism scanner to check for similarities in (wrong) answers. We will arrange an oral examination if we are unsure of your ability to achieve the course objectives. This oral examination will be taken through Skype. Should we find cheating or other forms of dishonest behaviour, this suspicion will be reported to the Board of Examiners.

The exam is in pdf. You need to complete your answers on a Word 2010/2011/2016/2019 (.doc/.docx) file on Windows or on Apple Macintosh. Make sure you clearly indicate the question number and subnumber in **bold.** So for example:

**4.** This is the first sentence of my answer.

**8.** This is the first sentence of my answer. Etc.

On the first page of you answer document, include your name, student number and university email address*.* ***You can use the answering template, available on the Nestor course website.***

On some questions, if needed to, you can insert a picture of your calculations if you feel that Word does not offer you a way to express your answer. Use this sparingly and be aware that you are responsible for the clarity and legibility of the document, including any pictures included.

Please check that the file you submit is readable by the software. Submission of files that cannot be opened by Word for Mac or Word for Windows will not be marked and results in a failing grade (1) for the exam. No exceptions to this rule will be made, so check your file carefully before submission.

***Good luck!***

**Assignments**

1. The Finch Company has 4 divisions. The following budgeted data are available for its Belgium division:   
   \* the sales are 5,000 units at a selling price of € 42.50 per unit  
   \* variable expenses are € 17.50 per unit  
   \* fixed expenses are € 100,000

Assignment

If is net operating income is increased by 20%, the total fixed expenses increased by 10%, and all other data remain as in the budget, calculate the percentual increase or decrease of the unit contribution margin.

Instruction

Show your calculation. Your answer should be a percentage increase or decrease of unit contribution margin.

Answer: Increased by 12%. See calculations and explanations in Excel file.

1. We refer to the previous question. The Swedish division from the Finch Company sells the same product as the Belgium division, in the same volume and at the same price. It also makes the same profit as the Belgium division, but the degree of operating leverage of the Swedish division is lower at this level of sales.

Assignment

Explain what this means for the contribution margin that the Swedish division realizes.

Instruction

Indicate whether the Swedish division’s contribution margin is higher or lower than the Belgian division. Explain your answer. No calculation is required.

Answer: a lower contribution margin. The degree of operating leverage = the contribution margin : the profit. If the degree of operating leverage of the Swedish division is at this level of sales lower and profits are equal for both divisions, its contribution margin must be lower.

1. The chief financial officer (CFO) of Crown Company has calculated a margin of safety percentage of 20% for the company. He also knows that the variable expenses are 75% of sales and sales in the break-even point are € 600,000.

Assignment

Calculate the net operating income of Crown Company.

Instruction

Show your calculations.

Answer: € 37,500. See calculations and explanations in Excel file.

1. At the present, a company’s total fixed expenses are € 6,000,000 and its contribution margin € 1.00 per product. In the near future, the management expects to produce and sell 5,000,000 products at the current selling price of the product, at which level she wants to make a profit of € 300,000.

Assignment

Calculate *by how much* the variable cost per product needs to *increase* or *decrease* to reach the target profit of € 300,000.

Instruction

Show your calculation.

Answer: Variable cost needs to decrease with € 0,26. Units sold to attain the target profit = (fixed expenses + target profit) : unit contribution margin. This means that the required contribution margin is € 1,26 per product, an increase with € 0,26, only to be realized with a decrease in variable costs per product with the same amount.

1. Avoidable costs include:

I. sunk costs

II. future costs that do not differ between alternative courses of action

Assignment

Explain which (if any) of these 2 statements are true.

Instruction

Explain your answer.

Answer: Neither is true. A sunk cost is a cost that has already been incurred, and which cannot be changed by any future decision, therefore unavoidable (and not avoidable) and that’s the reason why it is irrelevant for future decision making. A cost which does not differ between alternatives is also unavoidable (and not avoidable) for both alternatives in the same amount, and that’s the reason why it is irrelevant for future decision making.

1. Company Scary Sources produces and sells four products. Per unit data concerning these products are:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | A | B | C | D |
| selling price | | € 270 | € 300 | € 210 | € 243 |
| variable expenses: | | | | | |
|  | direct materials | € 72 | € 72 | € 45 | € 54 |
|  | other variable expenses | € 72 | € 108 | € 72 | € 72 |
|  | total variable expenses | € 144 | € 180 | € 117 | € 126 |

Each product consumes the same amount of raw material, at a cost of € 9 per kilo.   
The demand for the company’s products is very strong; with far more orders each month than the company is able to execute given the raw materials available for production.

Assignment

In order to maximize its profit, for which product should the company accept orders first?

Instruction

Show your calculations.

Answer: Product D. See calculations and explanations in Excel file. The key factor is not how much of a constrained resource a product uses, or how much the contribution margin for each product is, but rather how much contribution margin the product generates per unit of the constrained resource. That’s product D.

1. Zara Company makes 120,000 units per year of a part it uses in the products it manufactures. The unit product cost of this part is computed as follows:

Direct materials € 10

Direct labour € 9

Variable manufacturing overhead € 4

Fixed manufacturing overhead € 22

Unit product cost € 45

An outside supplier has offered to provide the company with all these parts it needs for € 37.50 per unit. If the company accepts this offer, the facilities now being used to make the part could be used to make more units of a product that is in high demand. The additional contribution margin on this other product would be € 300,000 per year.

If the parts were purchased from the outside supplier, all of the direct and variable cost of the part would be avoided. However, 75% of the fixed manufacturing overhead cost being applied to the part would continue even if the parts were purchased from the outside supplier. This fixed manufacturing overhead cost would be applied to the company's remaining products.

Assignment  
What is the net total advantage or disadvantage of purchasing the parts rather than producing them?

Instruction

Explain your answer and show your calculations.

Answer: € 540,000 advantage. See calculations and explanations in Excel file.

1. The Chief Executive Officer (CEO) of the Coffee Company decides to add a new line of coffee products to its current branches. Expected cost and revenue data for the new line are as follows:

Annual sales 6,000 units (1 unit = 1,000 kilo’s of coffee)

Selling price per unit € 750

Variable costs per unit:

\* Production € 420

\* Selling € 36

Avoidable fixed costs per year:

\* Production € 288,000

\* Selling € 360,000

Allocated common fixed costs per year € 180,000

If the new line of products is added to its existing product lines, it is expected that the contribution margin of other product lines at the Coffee Company will drop by € 81,000 per year.

Assignment

What is the lowest selling price per unit that could be charged for a new unit and still make it economically desirable to add this new product line?

Instruction

Show your calculations

Answer: € 577.50. See calculations and explanations in Excel file.

1. Xenon Company uses a predetermined overhead rate based on labour hours to apply manufacturing overhead to jobs. Xenon Company has provided the following estimated costs for next year:

Advertising expenses € 51,000

Salary of production supervisor € 120,000

Direct Labour € 180,000

Direct materials € 60,000

Rent on factory equipment **????????**

Sales commissions € 24,000

Indirect materials € 27,000

Xenon estimates that 7,500 direct labour hours and 6,000 machine hours will be worked during the year. The predetermined overhead rate per hour is € 28.

Assignment

Calculate the rent on factory equipment in the above Table.

Instruction

Show your calculations.

Answer: Rent on factory equipment equals € 63,000. Total manufacturing (!) overhead costs are the salary of production adviser, rent on factory equipment, and indirect materials. These together should be € 210,000 (7,500 labor (!) hours times € 28) and this means that rent on factory equipment should be € 63,000 (advertising expenses are irrelevant). See also calculations and explanations in Excel file.

1. Under absorption costing, which of the following costs should be absorbed in the cost price:

* indirect materials
* marketing costs
* depreciation costs of the factory building
* labour costs of the head of the assembly-line
* sales commissions
* lease costs of the office building
* executive compensation for the chief executive officer

Instruction

Your answer can contain more than 1 cost category. Explain your answer.

Answer: 3. Absorption costing concerns manufacturing costs (indirect materials, depreciation costs of the factory building, labour costs of the head of the assembly-line) and excludes sales, general and administrative expenses (the rest).

1. Maverick Machinery has been using a traditional overhead allocation system based on machine-hours. For the next year, Maverick Machinery decides to switch to an activity-based costing system using machine-hours and the number of batches processed as measures of activity. Information on these measures of activity and related overhead rates for the current year are as follows:

estimated activity predetermined overhead rate

machine hours 20,000 € 8 per machine-hour

number of batches 250 € 300 per batch

A specific job for next year will require 1,200 machine-hours and 18 batches to be processed.

Assignment

What would be the amount by which this job would have been overcosted or undercosted under the traditional system?

Instruction

Show your calculation

Answer: undercosted by € 900. See calculations and explanations in Excel file.

1. Arranging for shipments to customers is an example of a
2. organization-sustaining activity
3. product-level activity
4. batch-level activity
5. unit-level activity

Assignment

Explain which of the 4 activities these shipments are an example of.

Instruction

Only 1 answer is correct. Make sure you explain your answer.

Answer: c. is correct. Arranging for shipments to customers is performed each time a batch of products is transported to customers.

1. A consultant explains you the ‘ins’ and ‘outs’ of activity-based costing and makes the following statements:

I. In case of batch-level costs, activity-based costing will ordinarily shift costs from low-

volume products produced in small batches to high-volume products produced in large

batches.

II. Activity-based costing takes into consideration the allocation of manufacturing overhead as

well as selling, general and administrative overhead.

Assignment

Which (if any) of the above statement(s) is/are true.

Instruction

Explain your answer.

Answer: only II. is true. The other is the opposite.

1. Division High Quality Branches of a Dutch corporation requires 50,000 parts Alfa each year. The division has two options:

* High Quality Branches has a bid from an outside supplier for the parts Alfa at € 125.00 per unit.
* High Quality Branches has asked the Parts Division to provide it with parts Alfa. The Parts Division works for other divisions in the company as well as for outside customers. The parts Alfa would require € 62.50 variable production costs per unit.

In order to have time and space to produce parts Alfa, the Parts Division would have to cut down production of another part Beta it currently produces. The part Beta sells for € 200.00 per unit, and requires € 75.00 variable production costs per unit. Packaging and shipping costs of part Beta are € 15.00 per unit. Packaging and shipping costs for the new part Alfa would be € 7.50 per unit.

The Parts Division is now producing and selling 200,000 units of part Beta each year. Production and sales of part Beta would drop by 10% if the new part Alfa is produced for High Quality Branches.

Assignment

At which minimum price will the Parts Division sell the parts Alfa to High Quality Branches?

Instruction

Show your calculations.

Answer: € 114.00. See calculations and explanations in Excel file.

1. Possible pitfalls in allocating fixed costs are:

I. using sales as an allocation base

II. using a variable activity as an allocation base

Assignment

Which (if any) of the above statement(s) is/are true.

Instruction

Explain your answer.

Answer: Both I & II are true. See the textbook.

1. Renegade Company makes a product that has its peak sales in May of each year; see the company’s sales budget for the second quarter given below:

April May June

Budgeted sales € 300,000 € 400,000 € 250,000

The company has learned from past experience that 20% of a month’s sales are collected in the month of sale, another 50% in the following month and the remaining is collected in the second month following the sales. Bad debts can be ignored. February sales totalled € 200,000 and March sales totalled € 240,000.

Assignment

Calculate the total accounts receivable at the end of the second quarter.

Instruction

Show your calculations.

Answer: € 320,000. See calculations and explanations in Excel file. But a complete figure is not necessary. Another approach would be:

* May: 30% to be collected end of June
* June: 80% to be collected end of June

1. The standard cost card for one unit of a certain finished product shows the following:

standard quantity or hours standard price or rate

direct materials 20 pounds € 18 per pound

direct labour **???** hours € 19 per hour

variable manufact. overhead 8 hours € 7 per hour

The total standard variable cost for one unit of finished product is € 720. In February, the total production was 2,000 finished products. In that period the actual quantity of labour hours used per product was 14 hours and the actual labour rate € 17.50 per hour.

Assignment

Calculate the labour efficiency variance in February.

Instruction

Make sure to show your calculations and indicate whether your calculated variance is favourable or unfavourable.

Answer: € 76,000 favourable. See calculations and explanations in Excel file.

1. The following materials standards have been established for a particular product:

Budgeted output 1,500 products

Standard quantity per unit of output 10 kilo’s

Standard price € 20.00 per kilo

The following data pertain to operations concerning the product for the month January:

Actual materials purchased 15,400 kilo’s

Actual materials used in production 13,870 kilo’s

Actual price of materials purchased € 21.00 per kilo

Actual output 1,450 products

Assignment

Calculate the materials efficiency variance in January.

Answer: € 12,600 favourable. See calculations and explanations in Excel file.

1. You applied for a part-time job in a local manufacturing business. The chief financial officer (CFO) has developed a standard costing system in which manufacturing overhead is applied to units of product on the basis of direct labour-hours. As the year has just passed, the CFO asks you to determine all possible variances concerning the costs of one of the main products.   
   To begin with, you start focusing on the variable manufacturing overhead costs. Each unit of product requires two-and-a-half standard hours of labour for completion. The denominator activity for the year was based on budgeted production of 75,000 units. Total overhead was budgeted at € 900,000 for the year, and the fixed overhead rate was € 8.00 per unit. The actual data pertaining to the manufacturing overhead for the year are presented below:

Actual production 72,500 units

Actual direct labour-hours 163,125 direct labour-hours

Actual total overhead € 870,000 (from which € 580,000 was fixed)

Assignment

Calculate the variable overhead efficiency variance for the year.

Instruction

Show your calculations.

Answer: € 29,000 favourable. See calculations and explanations in Excel file.

1. Managers are often evaluated based on the return on investment (ROI) or Economic Value Added (EVA).

Assignment

Explain for each of these metrics which aspect of particular investment projects it highlights.

Answer: ROI allows investments when the relation between investment and return is favourable. EVA has allowance for Risk or Cost of Capital as well as return and investment.

1. The Jones & Langley Company sells wheel barrows. The margin of safety percentage for the sales of this product is 25%. The net operating income is € 72,000. The variable costs are 60% of sales.

Assignment

Calculate sales revenue at the break-even point.

Instruction

Show your calculations.

Answer: € 540,000. See calculations in Excel file.

1. To make a target profit of € 900,000 at a level of fixed expenses of € 5,400,000 a company has to produce and sell 500,000 products. The product selling price is € 30.

Assignment

Calculate the variable cost of the product.

Instruction

Show your calculations.

Answer: € 17.40. See calculations in Excel file.

1. Moonflies has been using a traditional overhead allocation system based on machine-hours. For next year, Moonflies decides to switch to an activity-based costing system using machine-hours and the number of batches processed as measures of activity. Information on these measures of activity and related overhead rates for the current year is as follows:

estimated activity predetermined overhead rate

machine hours 3,000 € 50 per machine-hour

number of batches 200 € 900 per batch

A specific job for next year will require 60 machine-hours and 5 batches to be processed.

Assignment

What would be the amount by which this job would have been overcosted or undercosted under the traditional system?

Instruction

Show your calculations.

Answer: undercosted by € 900. See calculations in Excel file.

1. The Balanced Scorecard uses several perspectives to evaluate the performance of the organization.

Assignment

Name 2 commonly used perspectives and explain in which way all perspectives of the Balanced Scorecard are connected.

Instruction

Explain your answer. Use examples if needed.

Answer: A correct answer needs to include the following perspectives: (1) Learning and growth; (2) Internal process; (3) Financial; (4) Customer. They are related because they operationalise the organisational strategy and vision.

**End of exam**