

MANAGEMENT OF AN INDUSTRIAL COMPANY

ATLAS COPCO INDUSTRIAL TECHNIQUE

FOR STUDENTS



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1.The business

1:1 Continuous questions

- a. What Business Logic(s) can your company be characterized as? Do not forget to also describe what Business Logics is, and to describe the type/s of Business Logic/s that characterize your company.

1:2 Short questions

- a. How do *economies of scale* occur?
- b. Give one example of a business logic within *spidering*

2. Planning the business

2:1 Continuous questions

- a. Discuss the vision and the mission of your company, and what these means. If you can't find these, give your suggestions for a vision and a mission for the company and discuss these instead, but then also indicate that these are your own suggestions.
- b. What is the strategy of your company? Cost leadership, differentiation or focus? (The whole company or just a part of it)
- c. What is action control, and how could that type of control be like in your company?

2:2 Short questions

- a. There are three types of *strategies*: low cost, segmentation, and... *What*?
- b. In the SWOT matrix, *strengths and weaknesses* are connected on their side, and *opportunities and threats* are connected on their side. In what way?
- c. What does the acronym *SWOT* stand for?
- d. According to the Boston matrix, a *milk cow (cash cow)* has a high market share and a low... *What*?
- e. What is the difference between *efficiency* and *effectiveness*?
- f. What are the three types of *master budgets*?
- g. Sketch up the *balanced scorecard* and describe the different parts in it.
- h. Discuss some advantages and disadvantages with *budgeting*.
- i. What is a vision?
- j. Management control can be used in two ways to make the employees work towards the objectives of the company; through responsibility and through... what?
- k. *Measures* should be Specific, Measurable, Accepted, Realistic, and... what?

3. Acting in the Market

3:1 Continuous questions

- a. The marketing mix approach, 4P, consists of four parts: Price, place, promotion and product.
What is place in this setting, and how does your company/a company use this?
- b. What four types of markets can be defined (eg what type of competition is there), and what type of market is it for your company (or eg for one of your company's products)?
- c. How does or could your company segment their products or customers?

3:2 Short questions

- a. What is the difference between *marketing mix* (4P) and *relationship marketing*?
- b. What does *4P* stand for?
- c. What is a *mixed economy* a mix of?
- d. What is a *monopoly*?
- e. A *price* can be set based on value, on competitors' prices, or... *What*?
- f. What is the label for a market with *one dominant company*?
- g. What is the label for a market with *a few dominant companies*?
- h. What is the label for a market where the companies try to *distinguish their products* from other company's products?
- i. What is an *oligopoly*?
- j. How do companies *price* their products, i e what bases are there for pricing?
- k. What's *place* in the marketing mix approach?
- l. In the course, we discussed four types of markets: Perfect competition, Oligopoly, Monopoly, and... what?
- m. One type of tactical pricing is *market penetration*. What does that mean?
- n. Give an example on how *segmentation of customers* can be done
- o. What is *B2B* an abbreviation of?

4. Organizing the Business

4:1 Continuous questions

- a. What organizational form does your company have (or do you think it has) and why is it so?

4:2 Short questions

- a. What is a *revenue center*?
- b. What is *lean manufacturing*?
- c. What do we mean with *informal organization*?
- d. What is the difference in responsibility in a *revenue center* compared to a *profit center*?
- e. What is special with a *functional organization*?
- f. According to *Mintzberg*, the leader has three roles: The interpersonal role, the informational role, and... What?
- g. An *intermittent* production process is a middle form between a continuous process and... what?

5. Costing Products and Orders

5:1 Continuous questions

- a. Give some examples on what could be indirect costs in your company, and explain what makes them indirect.
- b. What is direct labor, and what is machine costs? Give at least two examples each that could be possible in your company, and explain why they are direct labor or machine cost, respectively
- c. What is an Activity Based Costing, and how could it be structured for your company (in this, give some examples on some activities and their drivers)?
- d. Give two examples each of possible parts of sales overhead and direct sales costs in your company, and explain why they are overhead and direct respectively
- e. Discuss two possible activities, and drivers to these, in your company. Why would it be better, in this case, to use that information than to deal with the cost as an overhead?
- f. What is total contribution margin? Explain this and the parts that it contains of with an example, real or fictive, from your company.
- g. What is a process costing system, and how could it be used in your company (if it isn't useful at all in your company, give an example on an at least somewhat possible business on the side of it)?
- h. Suggest one model for costing that could be appropriate for your company (or a part of it). Why is this model for costing appropriate for your company?

5:2 Short questions

- a. What is an *indirect cost*?
- b. How is the *contribution margin ratio* calculated?
- c. Costs and revenues used in *accounting* can differ to those used in *costing* in three ways. What ways?
- d. What is the difference between *profit (or loss) and return*?
- e. What is a *direct cost*?
- f. What is a *relevant cost*?
- g. What is an *opportunity cost*?
- h. What is a *sunk cost*?
- i. What is a *full cost*?
- j. What is *equivalent costing*?
- k. When is a *process costing* model suitable?
- l. What is a *stepwise costing* model?
- m. Define the words *drivers* and *activities*
- n. What is *contribution margin costing*?
- o. How is the cost calculated in a *process costing* system?

- p. What is *direct wages*?
- q. What is a *stepwise cost* (=semi-fixed cost)?
- r. What is a *driver* (cost driver) in an activity-based costing system?
- s. What do you get, if you take the difference between the relevant revenue and the relevant cost, and divide this with the relevant revenue (which is the same as the price)?
- t. When is *process costing* suitable?
- u. In the sales department: What makes a salary to one person a part of *sales overhead*, and a salary to another person a *direct sales cost*?
- v. Mention at least two *advantages* with using *activities and drivers* rather than to deal with a cost as an overhead

5:3 Grundet AB

Help Grundet AB to, for each of the following five events, find out if it is a direct cost, a material overhead, a machine cost, a sales overhead, or an administrative overhead. For each answer, you should *also state why* it is such a cost.

- a. Cost of a lathe machine used by all products
- b. Labor costs to produce product A
- c. Monthly salary to the company's only seller
- d. Cost of a truck used for receiving the purchased material
- e. The cost (depreciation and maintenance) for a system used for production control

5:4 Spiken

A company produces nails of one single dimension and type of hardening. This year they estimate to produce 85,000 boxes of such nails. According to the budget, the company will have the following costs for their production:

- Variable costs: SEK 1,105,000
- Fixed costs: SEK 765,000

The year before this, they produced 115,000 boxes of nails. Normally, over a 10-year-period, they produce 100,000 boxes of nails per year.

What is the cost of a box of nails?

5:5 Sfinxen Ltd

The CEO of Sfinxen Ltd is excited in her speech to the employees! "Last year was a real success! We produced 19,800 sphinxes, that is, 10 % more than a normal year. Our fixed costs amounted to SEK 3,150,000, and our variable costs amounted to SEK 2,196,000. Our total capital is now SEK 5,000,000, and the profit for last year was SEK 820,000. Finally, we have overcome the problems!"

Sfinxen Ltd produces table-sphinxes, a product soon to be found on each man's table. The company uses process costing.

- a. What is the cost for each sphinx?

- b. What are the *prerequisites* for a company to use process costing?

5:6 Sjavaler

The company where you work produces Sjavaler. Sjavaler are tailored for different customers and orders. The company has, in its budgeting process, calculated the following charges; for sales, general & administrative overhead 45 %, for material overhead 40 %, and for machine costs SEK 800 per hour

Now, the company has received an order for 20 Sjavaler from one of its smaller customers. The company expects that they must use 2 hours of work (at an hourly rate of SEK 250 each) per Sjavaler, and that each unit will use material for SEK 1,750. To set up the production for this order is expected to cost SEK 13,000. The machines will be used 10 hours for this order. The sales bonus to the sellers for this order is expected to be SEK 5,000. The customer is willing to pay SEK 100,000 for the order.

Calculate the *full cost* for this order. What is the full cost of the order?

5:7 Savox AB

Savox AB paints on commission for other companies. For the year 2018, the company has budgeted a direct material cost of SEK 140,000, direct wages of SEK 40,000, machine costs of SEK 88,000 for the planned 880 hours use, sales general and administrative overhead of SEK 118,400, and material overhead of SEK 28,000. The company uses a mark-up of 10 % on the full cost to cover the demand on profit when the price is set.

Now the company has received an order for painting a plastic component. For this, paint for SEK 5,000, 132 machine hours and 10 working hours, that each will cost SEK 600, will be needed.

- a. What is the *full cost for the company* according to budget?
- b. What *mark-ups* should the company use during the year?
- c. What *price* should they set for the received order?

5:8 Schyssta altaner AB

Schyssta altaner AB is a company that produces custom made patios on order. For this year they have budgeted the following costs: Direct material SEK 2,400,000, general & administrative overhead SEK 1,849,400, direct wages SEK 1,400,000, material overhead SEK 1,008,000, sales overhead SEK 528,400, and machine costs of SEK 476,000 for the planned 2,380 hours of use. Now they have received an order on a patio, which will lead to a cost for direct material of SEK 42,000, a cost for direct wages of SEK 10,000, and 17 hours use of the machines.

- a. What is the total production cost for the year according to budget?
- b. What is the total full cost for the year according to the budget?
- c. What mark ups and costs per hour are needed to cover the indirect costs during the year?
- d. What is the full cost of the order now received?
- e. Give three examples on what can be included in "machine cost"

5:9 Spalktyr AB

Spalktyr AB produces different kinds of Spalktyr. For this year they are using the following charges in their costing: for material overhead 25 %, sales, general and administrative overheads 50 %, and machine costs SEK 2,000 per hour. The company has now received an order for a form of Spalktyr, S43. This order is for 100 units of S43. Each of these S43 uses material for SEK 480, 10 labor hours, each hour at a cost of SEK 200, and 40 machine hours. To produce these 100 S43 a set-up of the machine is required at an estimated cost of SEK 10,000. For this order also a sales bonus of SEK 20,000 to the intermediaries have to be paid.

- a. How and when do companies calculate the types of charges that this costing method uses?
- b. Calculate the full cost for the order.

5:10 Halkisar

Stringent AB produces Halkisar of two types: Badrumshalkis for the bathroom, and Tvättstugehalkis for the laundry. Through advanced tests (the employees have been tiptoeing barefooted in bathrooms as well as in washrooms), the company has concluded that the two products functions equally in both environments; bathrooms and laundries. So, it becomes equally slippery no matter which of the products that is used. Therefore, the company has decided to only produce one of the products, and to market it as Universalhalkis for both the environments. The question is, then, which of the two products to produce. The company estimates that the price and the cost per unit that respective product have today also will be the price and the cost when the product is later sold as Universalhalkis.

The price per Badrumshalkis is SEK 340, and the price per Tvättstugehalkis is SEK 180. The variable specific cost is SEK 220 per Badrumshalkis, and SEK 120 per Tvättstugehalkis. The company can only use 8 000 kg material. Each Badrumshalkis uses 1.2 kg material, and each Tvättstugehalkis uses 0.5 kg material.

- a. *Which of the two products Badrumshalkis and Tvättstugehalkis should be produced and marketed under the name Universalhalkis? Justify your answer with calculations for the two products that shows this. There are two ways to calculate this, if you do both the calculations you can get 8 exam points at the most, otherwise 6 exam points.*
- b. *What is a relevant cost?*

5:11 BegränsAB

BegränsAB produces two products: Beg and Räns.

The price is SEK 2,120 per Beg. The variable relevant cost for each Beg is SEK 840. In this, the cost for four hours of production is included. Each Beg has an irrelevant cost of SEK 1,000.

For each Räns, the price is SEK 800. The variable relevant cost for each Räns is SEK 450. In this, the cost for one hour of production is included. Each Räns has an irrelevant cost of SEK 100.

Now, the company has a shortage when it comes to the workforce in the manufacturing. They only have 2,000 hours of work.

- a. *What product should the company produce, and at what volume? Motivate your answer with calculations.*
- b. *Suppose that there is no longer a shortage in workforce. The company can, as a maximum, sell either 3,000 Beg or 3,000 Räns. What product should the company produce now, if they only want to produce one of the two products? Motivate your answer with calculations.*

- c. In some cases, a *combination of products* is the optimal production (that is, not as in the example above to only produce one of the products). *When* can this occur?

5:12 Trångt

The company Trångt in Trångsund is planning to start producing the product Trånger. They can choose between two types of Trånger; Type A and Type B. The variable relevant cost is SEK 60 per unit for Type A, and SEK 110 per unit for Type B. The total fixed cost is estimated to SEK 30,000. Each Type A can be sold for SEK 150, and each Type B for SEK 210.

The company can only buy 1 500 kilo material, and this is a serious limitation for the company. Each Type A uses 2 kilo material, and each Type B uses 2.5 kilo material.

How many units should the company produce of Type A and Type B, respectively? Present your answer in calculations as well as in arguments for your answer.

5:13 HabroVink AB

"How many Habro should we produce, and how many Vink?" the CEO of the company HabroVink in which you are a newly employed engineer asks. "No problem, I'll fix this", you say, because you have participated in the course Industrial management and, therefore, know how to solve this type of problems. Also, you remember that there are two different ways to solve this, and since you want to show your new boss how smart you are, you decide to present proofs for optimal production in both ways.

The variable relevant cost is SEK 300 per Habro, and SEK 220 per Vink. The price is set at SEK 1,000 per Habro and 800 SEK per Vink. The total fixed cost of the company is estimated to SEK 2,500,000 per year.

What limits the company's production is the availability of material; the company can only get 29,000 kilo of it per year. Each Habro demands 2 kilo material, each Vink 1.45 kilo material.

How many units should the company manufacture of Habro and Vink respectively?

5:14 ChoicesAB

ChoicesAB present the following calculated data for 9 requests from customers. The company has enough capacity to accept all these 9 production orders.

| | A | B | C | D | E | F | G | H | I |
|---------------|---------|--------|---------|--------|---------|---------|--------|-------|--------|
| Price | 120,000 | 80,000 | 130,000 | 60,000 | 90,000 | 85,000 | 60,000 | 7,000 | 92,000 |
| Relevant cost | 130,000 | 50,000 | 80,000 | 40,000 | 70,000 | 85,000 | 20,000 | 4,000 | 45,000 |
| Full cost | 160,000 | 60,000 | 100,000 | 65,000 | 100,000 | 130,000 | 25,000 | 5,000 | 65,000 |

- a. Which of the requests should the company *accept*?
- b. *Argument* for your answer in a. *Why* should they accept those requests?
- c. Give a definition of "*relevant cost*".
- d. Give a definition of "*full cost*".

- e. Assume that the company doesn't have enough capacity for all 9 production orders. *What more information* do the company need to decide what requests to accept?

5:15 Bodyworks Ltd

Bodyworks Ltd produces two parts to producers of exclusive dolls; Arms and Legs. For these products, the following information (per unit) is provided:

| | Arms | Legs | |
|------------------------|------|------|----------|
| Selling price | 200 | 140 | SEK |
| Variable relevant cost | 120 | 100 | SEK |
| Allocated costs | 40 | 40 | SEK |
| Machine time per unit | 10 | 40 | minutes |
| Material used per unit | 2 | 0.5 | kilogram |

- a. Which of the two products should they produce, if there is only *500 machine hours available* but enough of all other resources?
- b. Which of the two products should they produce, if there is only *1,000 kg of material available* but enough of all other resources?
- c. If they *can only sell* a maximum of 1,000 Arms and a maximum of 1,000 Legs, how many of the two products should they produce, if there is only *1,000 kg of material available* but enough of all other resources?
- d. The answers to A-C can be calculated. But, if you think about it, are there any problems with this way of solving the questions; anything more that should be *considered* in this decision?

5:16 Kvadraten AB

Kvadraten AB produces a beautiful square of something, used for decoration purposes. It has three different types of these squares: Aztec, Baztec, and Caztec. Each unit of these has a direct cost in sales of SEK 20, the same for all three products. The total manufacturing cost, which is to produce all three products, is estimated to SEK 2,320,000 for this year. During the year, the production is estimated to 20,000 units in total, with 10,000 units of Aztec, 2,000 units of Baztec, and 8,000 units of Caztec. The cost is estimated to depend on the number of units, but also on the number of square meters for each product. Each Aztec is 2 square meters large, each Baztec is 3 square meters large, and each Caztec is 4 square meters large.

- a. What *costing method* should Kvadraten AB use?
- b. Why should they use this method?
- c. What is the *cost for each unit* of Aztec, each unit of Baztec, and each unit of Caztec?

5:17 Valenta AB

Valenta AB manufactures Ekvivalents. The direct cost per equivalent amounts to SEK 700. Other costs amount to SEK 2,920,000 in total. This cost, which is mostly composed of material, is allocated to

products due to the following weight for each product; Valent A 3.5, Valent B 7, and Valent C 12. The company estimates to produce 1,200 Valent A; 2,200 Valent B; and 800 Valent C.

What is the *total cost per unit* for Valent A, Valent B, and Valent C, respectively? Show your calculations for this, step by step, according to the relevant model.

5:18 Boranza nostalgic

Please note! This exercise builds on the earlier Swedish standard from year 1937 that still has an impact on some company's absorption costing. The exercise is only valid in courses where also this type of costing is discussed.

Boranza AB produces, amongst other products, a product named model B. The company has now received an order for 150 units of model B. Each of these units requires material for SEK 50. The order will also require direct labor costs of SEK 10,000 and a set-up of the machines which is estimated to cost SEK 8,000.

The company has budgeted the following costs for the year: Administrative overhead SEK 1,200,000; direct labor SEK 2,000,000; direct material SEK 1,000,000; sales overhead SEK 3,000,000; materials overhead SEK 400,000; special direct sales costs SEK 500,000; special direct production costs SEK 200,000; and production overhead SEK 2,400,000.

- a. What's the budgeted *production cost* of the year?
- b. What's the budgeted *full cost* of the year?
- c. What four *overhead charges* should the company use during the year?
- d. Construct a full cost table for this order. What is the *full cost* of the order?
- e. Give two examples on what can be parts of the *materials overhead* of the company and explain why these can be parts of materials overhead.

5:19 Egnakost nostalgic

Please note! This exercise builds on the earlier Swedish standard from year 1937 that still has an impact on some company's absorption costing. The exercise is only valid in courses where also this type of costing is discussed.

Egnakost AB produces several different products, one of them being the model Y5. The company has now received an order for 2,500 units of that model. Each of these units uses material for SEK 100 and 10 labour minutes, each minute at a cost of SEK 5. To produce this order, a set-up of the machine is required at an estimated cost of SEK 40,000. For this order, also, a sales bonus of SEK 30,000 to the intermediate company must be paid.

The company has budgeted the following costs for the year: Direct Material SEK 5,200,000, Direct Labour SEK 4,000,000, Direct production costs of other types SEK 500,000, Direct sales costs SEK 1,000,000, Sales, General and Administrative costs (SG&A) SEK 3,800,000, Materials overhead SEK 1,300,000, and Production overhead SEK 8,000,000.

- a. What is the budgeted *production cost* of the year?
- b. What is the budgeted *full cost* of the year?
- c. What *overhead charges* should the company use during the year?
- d. Construct a full cost table for this order. What is the *full cost* of the order?
- e. Production overheads are high. What *problems* could this cause?

5:20 SunMoon AB

SunMoon AB is a provider of small costing systems. They start from a standard system and customize the design of it to each customer's own preferences, and structure and fill in the starting data base. The company has two different versions of the costing system, Sun and Moon, and is now discussing if they should stop providing one of them since it's estimated to be very difficult to get qualified employees for this week soon. For the two different versions, the following information (per unit) is provided:

| | System Sun | System Moon | |
|------------------------|------------|-------------|-------|
| Selling price | 22,000 | 12,000 | SEK |
| Variable relevant cost | 6,000 | 2,000 | SEK |
| Allocated costs | 5,000 | 5,000 | SEK |
| Design hours per unit | 10 | 10 | hours |
| Input hours per unit | 25 | 10 | hours |

- a. Which of the two products should they provide, if there is only *500 design hours available* per month (but enough of all other resources)?
- b. If they *can only sell* a maximum of 40 System Sun and a maximum of 40 System Moon per month, how many of the two products should they provide, if there is only *500 design hours available* (but enough of all other resources)?
- c. Which of the two products should they produce, if there is only *1,000 input hours available* per month (but enough of all other resources)?
- d. There are two different ways to find the answer to A and C; one absolute measure and one relative measure. If you haven't shown both ways earlier, do that now; there's an extra 4 points if both solutions are shown for problem A and C.
- e. Explain what "relevant cost" and "allocated cost" in the table stands for; give a definition for each of them.

5:21 Ramborini Ltd

Ramborini Ltd has free capacity and is now planning to use this to produce Aboner and/or Bejoner. Aboner can be sold for SEK 4,000 each and has a variable relevant cost of SEK 1,800 each. Bejoner can be sold for SEK 2,000 each and has a variable relevant cost of SEK 1,400 each. Each Aboner demands 40 minutes of the machines and 4 kg of material; each Bejoner demands 20 minutes of the machines and 2 kg of material. The company uses an overhead allocation of 10 % for materials, 20 % for production, 30 % for administrative, and 40 % for sales.

- a. Which of the two products should they produce, if there is only *800 machine hours available* per year (but enough of all other resources)?
- b. If the company *can only sell* a maximum of 1,000 Aboner and a maximum of 1,000 Bejoner per year, how many of each of the two products should they produce, if there is only *800 machine hours available* per year (but enough of all other resources)?
- c. Which of the two products should they produce, if there is only *2,000 kilo material available* per year (but enough of all other resources)?

- d. If the company *can only sell* a maximum of 1,000 Aboner and a maximum of 1,000 Bejoner per year, how many of each of the two products should they produce, if there is only 2,000 *kilos of material available per year* (but enough of all other resources)?
- e. There are two different ways to find the answer to A and C; one absolute measure and one relative measure. If you haven't shown both ways earlier, do that now; there's an extra 4 exam points granted if both solutions are shown for problem A and C.

5:22 Garqso Ltd

Garqso has budgeted the following costs for this year: Direct material SEK 4,200,000, direct wages SEK 2,100,000, direct sales costs SEK 1,500,000, special direct production costs SEK 550,000, sales, general & administrative overhead SEK 6,000,000, material overhead SEK 840,000, and machining costs SEK 2,310,000 for the planned 4,200 machine hours. Now they have received an order which will lead to a cost for direct material of SEK 86,000, a direct sales cost of SEK 500, a special direct production cost of SEK 1,300, a cost for direct labor of SEK 5,000 and 10 machine hours.

- a. What is the total *production cost* for the year according to the budget?
- b. What is the total *full cost* for the year according to the budget?
- c. What *mark ups* are needed to cover for the indirect costs during the year?
- d. What is the *full cost of the order* now received?
- e. In general: How does direct costs *differ* from indirect (overhead) costs?
- f. Give two examples on what can be included in "*direct sales costs*"

5:23 Lackerian AB

Lackerian AB paints on commission for other companies. For the year 2016, when the machines are planned to be used for 2,000 hours, the company has budgeted a direct materials cost of SEK 2,500,000, direct wages of SEK 1,500,000, direct consultancy costs in production of SEK 1,250,000, sales, general and administrative overhead of SEK 3,100,000, machining cost of SEK 1,500,000, and material overhead of SEK 1,250,000. The company uses a mark-up of 10 % on the full cost to cover the demand on profit when the price is set.

Now the company has received an order for painting. For this, direct material of SEK 60,000, consultancy costs in production of SEK 20,000, direct wages of SEK 45,000 and 60 machine hours will be needed.

- a. What is the *total production cost* according to budget?
- b. What is the *total full cost* according to budget?
- c. What *mark-ups* should the company use during the year?
- d. Present an absorption costing calculation of this order. What is the *full cost* of this order?
- e. What *price* should the company offer for this order according to the calculations?
- f. Give examples on what the content of *direct material and materials overhead* could be, respectively, and discuss the *difference* between the two.

5:24 Tolknar AB

The company Tolknar AB produces, amongst other products, model A43. The company has now

received an order for 3,000 units of these A43-Tolknar. Each of these units uses material for SEK 50 and 16 labor minutes, each minute at a cost of SEK 4. To produce this order, a set-up of the machine is required at an estimated cost of SEK 56,000. The machines will be used for 192 hours for this order. For this order also, a sales bonus of SEK 80,000 to the intermediate company must be paid.

The company uses a charge for material overhead of 40 % a charge for sales, general and administrative overhead of 70 %, and SEK 1,000 per machine hour.

Construct a full cost table for this order. What is the *full cost, in total and per unit?*

6. Decisions about Investments

6:1 Continuous questions

- a. For an/a possible investment in your company, argue for why it is/isn't a replacement, an expansion, a rationalization and an environment investment, respectively.
- b. Imagine a possible investment in your company. What can be parts of the appraisal (shortly explain what economic life and interest is, and explain shortly and give examples on cash in, cash out and disposal value that can be part of it).
- c. What is an initial outlay? Also, give an example on what could be an initial outlay in a (possible) investment in your company
- d. Discuss what one more risky and one less risky investment could be for your company. Give your company advice on how to decide the interest on each investment: how should they think in this?
- e. What types of investments are there in your company?
- f. How is the interest for investment appraisal calculated with respect to risk and inflation? Discuss this, with a special focus on possible risks with investments in your company.

6:2 Short questions

- a. There are four types of investments: Expansion investments, rationalization investments, environment investments, and... *what*?
- b. The *interest* used in investment analysis is real interest + inflation + ... *what*?
- c. In what way is the *payback calculation* short sighted?
- d. Why do we use *interest* in investment analysis?
- e. One type of investment that the company can make is an expansion investment. What are the other three *types of investment*?
- f. Give one example of an *intangible investment*.
- g. One type of investment is *replacement investments*. What characterizes such an investment compared to other types of investments when it comes to the investment appraisal?
- h. What is *WACC*?
- i. What is the difference between *technical life* and *economic life* in investment analysis?
- j. What is an *initial outlay*?
- k. What is *present value*?

6:3 IntrovertAB

IntrovertAB produces Introvertörer. Now they are planning to build up a temporary production of expandable Introvertörer for a customer. If they go into this production, it will result in initial investments of SEK 1,000,000. The production will then run for eight years and give annual cash inflows of SEK 500,000, and annual cash outflows of SEK 250,000. After eight years, the plant must be dismantled and the site restored. This results in an additional cash outflow of SEK 1,000,000.

The discount rate for this type of project, with this level of risk, is 8%

- a. Calculate the investment's *net present value*. Is the investment *profitable*?
- b. Calculate the investment's *annuity*
- c. Calculate the investment's *payback time*
- d. Calculate the investment's *IRR, internal rate of return*. A tip for calculating this can be to summarize all cash inflows and cash outflows first.

6:4 Fruttsvarv

A company needs a Fruttsvarv. They have to decide whether to buy it or to lease it. They want you to help them with the calculations for this.

If they choose to buy a Fruttsvarv, this will give an investment of SEK 840,000. The estimated economic life is 10 years. After this, the machine can be sold for SEK 150,000.

If they, instead, choose to lease the machine, they can do this for 10 years. The charge for this would in that case be SEK 12,000 per month. After the lease period, the lessor takes care of the machine and is responsible for to uninstall it, without no extra costs for the company.

The company uses an interest of 10 %.

- a. What is the *yearly cost* for the alternative to *lease* the Fruttsvarv?
- b. What is the *yearly cost* for the alternative to *buy* the Fruttsvarv?
- c. *What alternative should be chosen?* Argument for your answer

6:5 Falsetterna AB

Falsetterna AB produces high plastic towers, and are now planning to produce these in a new dimension. To do this, a new machine is needed; an investment of SEK 620,000. This sum includes a machine for SEK 570,000, and transportation and installation of the machine for SEK 50,000. Transport and installation is taken care of by another firm than the one selling the machine.

The company will produce the product for 5 years, and after that the machine will be sold. They expect to get SEK 10,000 for the machine when it is sold. At that time they will also have a cost for uninstalling the machine of approximately SEK 60,000. When it is sold, the machine is estimated to be useful for the buyer yet another 3 years before it is unusable.

The yearly cash inflows are expected to be SEK 320,000, except for year 5 when the cash inflows are expected to be only SEK 150,000 due to that the products must be sold on sale the last year. The yearly cash outflows are expected to be SEK 80,000 all five years.

The company has a pay-back demand of 3 years. The interest is 12 %. For a-c below, the calculations must be presented.

- a. What is the *net present value* of the investment? And, should the company invest in the machine? Motivate your answer!
- b. What is the *annuity* of the investment? And, should the company invest in the machine? Motivate your answer!
- c. What is the *pay-back time* of the investment? And, should the company invest in the machine? Motivate your answer!
- d. Suppose that the company has a demand of 8 % *internal rate of return*. In that case, should the company invest in the machine? Motivate your answer!

- e. In the text of the question, the word "cost" is used in one place. What is wrong with using this word? Which word should be used instead, and how could this be different from the cost in this example?

6:6 Nyinvest AB

The company Nyinvest AB plans to invest in a new machine. This machine requires an initial investment of SEK 500,000. The machine is estimated to have an economic life of 10 years. The company plans to sell products, produced in the machine, for SEK 200,000 per year, and estimates that this will result in yearly cash outflows of SEK 100,000. The machine is depreciated with SEK 100,000 per year during the first five years. After ten years, the machine has a negative disposal value (due to costs to dismantle and scrap the machine) of SEK 200,000.

The company uses 8 % as interest on this type of investments. The demand for internal rate of return is 8 %. The demand for payback time is 3 years.

Calculate the *net present value* of the investment. Should the company invest in the machine?

- a. Calculate the *pay-back time* of the investment. Should the company invest in the machine?
- b. Calculate the *internal rate of return* of the investment. Should the company invest in the machine?

6:7 AlternAB

AlternAB will invest in a new lathe, which will replace the earlier one in a process that is planned to be going on in the foreseeable future. The cash inflow in the operations where the lathe will be used is SEK 420,000 per year. The company uses an interest of 7 % for this type of investments. They depreciate machines in five years (20 % per year during five years). They choose between two different lathes:

Lathe A has an initial outlay of SEK 1,050,000, and an economic life of 7 years after which it can be sold which results in a positive disposal value of SEK 150,000. It will give cash outflows in the form of wages of SEK 150,000 per year, and in the form of material and energy of SEK 50,000 per year.

Lathe B has an initial outlay of SEK 1,430,000, and an economic life of 9 years after which it can be sold which results in a positive disposal value of SEK 220,000. It will give cash outflows in the form of wages of SEK 100,000 per year, and in the form of material and energy of SEK 40,000 per year.

- a. What is the *net present value of lathe A*?
- b. What is the *annuity of lathe A*?
- c. What is the *net present value of lathe B*?
- d. What is the *annuity of lathe B*?
- e. What alternative should AlternAB *choose*? Also, indicate if it is the net present value, the annuity, or both that are *relevant* to make this decision.

6:8 Xort

The company Xort is thinking about buying a new machine. The estimated technical life of such a machine is 12 years, and the estimated economical life is 8 years. The company uses an interest of 6 percent in their calculations, the demand for payback time is 5 years, and the demand for internal rate of return is 9 %.

The initial outlay for the machine is estimated to be SEK 900,000, while the cash inflow is estimated to be SEK 300,000 per year and the cash outflow to be SEK 150,000 per year. After the last year, the company can sell the machine for SEK 200,000.

- a. Calculate the *net present value* of the investment
- b. Calculate the *annuity* of the investment
- c. Calculate the *internal rate of return* of the investment
- d. Calculate the *payback time* of the investment
- e. Discuss the different measures in a-d above in means of; *should the company invest* in the machine?

6:9 Kohurt

A company is planning to invest in a new machine: A Kohurt which cost SEK 840 000. It will, during the three years that the company plan to use the Kohurt, give annual net cash inflows of SEK 320,000 year 1, SEK 280,000 year 2, and SEK 240,000 year 3. The disposal value (positive) is thereafter SEK 40,000.

- a. Should the company invest in the Kohurt, if the company is using a payback calculation method? The company demands that the payback time should be no longer than three years
- b. What is it that makes a payback calculation problematic, theoretically speaking?
- c. What is the Net present value of the investment? The interest used on this type of investments is 10 %
- d. What is the annuity of the investment?
- e. What is the internal rate of return of the investment?

6:10 A new machine

A company plans to invest in a new machine. For this, the following information has been collected:

| | |
|------------------------|-----------------------|
| Initial investment | SEK 140,000 |
| Yearly net cash inflow | SEK 30,000 |
| Economic life | 8 years |
| Disposal value | SEK 10,000 (positive) |
| Interest | 8 % |

The demand on payback time in the company is 5 years.

- a. Calculate the *net present value* of the investment
- b. Calculate the *annuity* of the investment
- c. Calculate the *payback time* of the investment
- d. *Comment* on your calculations; should the company invest in this machine?

6:11 Sablar

Sablar AB is considering to invest SEK 240,000 in a machine that is estimated to have an economic life of 8 years. The estimation is that this machine will give cash inflows of SEK 60,000 each year 1 and 2, and then the cash inflow will increase due to higher volumes of sales to be SEK 80,000 each year 3 to 8. The cash outflow is estimated to be SEK 20,000 per year the first six years, and thereafter will raise to be SEK 30,000 each year due to increased costs for maintenance. The disposal value year 8 is positive; the estimation is that the company will get SEK 40,000 for the machine. The interest used is 15 %, and the demand for pay-back is 4 years. The demand for internal rate of return is 14 %.

- a. Should they buy the machine according to the *net present value method*? Show your calculations.
- b. Should they buy the machine according to the *annuity method*? Show your calculations
- c. Should they buy the machine according to the *pay-back method* (without interest)? Show your calculations
- d. Should they buy the machine according to the *internal rate of return method*? You DO NOT have to show your calculations if you don't want to; but you have to argue for your answer.

6:12 InvesterAB

InvesterAB needs to replace its numerically controlled drilling machine again. It has two alternatives for this.

Machine A has an initial outlay of SEK 2,000,000. The economic life of this machine is 8 years. The disposal value after 8 years is positive: SEK 50, 000.

Machine B has an initial outlay of SEK 1,300,000. The economic life of the machine is 5 years. The disposal value after 5 years is 0.

The company uses the interest rate 10 %. The volume of the produced product is estimated to be the same as earlier, 2,000 units each year. The price for the product sold is 400 SEK. There are three types of yearly costs associated with the machine:

- The cost for material and energy is SEK 50 per unit produced, the same for both alternatives
 - The cost for labor is SEK 150,000 per year, the same for both alternatives
 - The depreciation the first five years is SEK 400,000 (SEK 2,000,000 /5 years) for machine A, and SEK 260,000 (SEK 1,300,000 /5 years) for machine B
-
- a. What is the *Net Present Value of machine A*?
 - b. What is the *Annuity of machine A*?
 - c. What is the *Net Present Value of machine B*?
 - d. What is the *Annuity of machine B*?
 - e. What alternative should InvesterAB chose, and why?

6:13 KingKong [20 points]

The company KingKong will invest in a new Drakorsk for the Styrbrunet. The company uses an interest of 8 % in their investment appraisal for investments with this level of risk. The price for a Drakorsk suitable for the Styrbrunet of the company is SEK 180,000. The economic life for this

Drakorsk is estimated to eight years (which requires a renovation of the Drakorsk year 4, that will cause a cash out of SEK 40,000 that year). The company estimates to get SEK 70,000 in cash in each year for the products that will be produced in the Drakorsk, and to have a cash out of SEK 27,000 for the operation of the Drakorsk. At the end of year 8, the Drakorsk needs to be dismantled, which is estimated to cause a net cash out of SEK 20,000 (the sales value of the used Drakorsk SEK 15,000 less the cost of dismantling it of SEK 35,000).

- a. What's the *present value* of this investment?
- b. Is the investment *profitable* according to the *present value method*? Motivate your answer.
- c. What's the *annuity* of the investment?
- d. Is the investment *profitable* according to the *annuity method*? Motivate your answer'
- e. What's the *pay-back time* of the investment?
- f. You don't have to calculate the internal rate of return for this investment, but; is the *internal rate of return* higher or lower than 8 % (the interest that you used for this investment)? Motivate your answer.

6:14 AnimaSpel AB

AnimaSpel AB wants to take road trips around the country to various shopping centers and the like with an arcade filled with their products, in order to increase the interest in their products. Therefore, they have decided to buy a truck (a tractor with a trailer), let it be painted with the company logo and avatars and decorate it with game venues, information walls and other stuff. They are now considering whether to buy a new or a used truck.

For a new truck, they must pay SEK 4,000,000, furnished and complete with all the equipment needed for this. The economic life is estimated to 8 years for this truck. The disposal value after eight years is estimated to + SEK 500,000.

They also found a used truck that meets the requirements, for which they must pay SEK 2,000,000 to buy, also including the furnishing and equipment required. The economic life is estimated to 5 years for this truck. The disposal value after five years is estimated to + SEK 200,000.

AnimaSpel is using an interest of 12%. Cars are depreciated over five years, and the same depreciation period will be used for the truck that they purchase for this. The company believes that the truck will give a substantially increased interest in the company's games over the years when the investment is utilized, and also afterward, since most customers becomes regular and loyal customers. They aren't able to put an exact figure on this, and therefore they leave this outside of the investment appraisal.

One advantage of the new truck is that it has a more modern fuel technology than the used one has: For example, it has an Eco Hybrid engine that loads when driving, and it automatically switches to electric power when appropriate. Another advantage is that it has a significantly lower need for service and repairs, and this is true throughout the life time of the truck since AnimaSpel, if purchasing the new truck, also will buy a service package that provides a fixed cost for this for the years. The annual costs (fuel, salaries, service package covering maintenance and repairs, insurance, depreciation, electricity etc.) are expected to amount to SEK 1,800,000 per year for the first five years, and then to SEK 1,000,000 per year over the remaining three years. The used truck has an estimated annual cost (fuel, salaries, maintenance, repairs, insurance, depreciation, electricity etc.) of SEK 1,900,000 per year for all five years.

The company believes that this is a very good investment, and also states that this is something that they will do also in the future; after the economic life of the truck, they will probably replace it with another one.

- a. Give one example each of a positive item and a negative item that may be part of the *disposal value* of the trucks in this example
- b. The new truck has 8 years and the used truck has 5 years of economic life. Define the concept of *economic life*
- c. What is the *net present value* of the *new* truck?
- d. What is the *annuity* of the *new* truck?
- e. What is the *net present value* of the *used* truck?
- f. What is the *annuity* of the *used* truck?
- g. Which alternative should AnimaSpel *choose*, and *why*?

6:15 Shazam Ltd

It's soon time for Shazam Ltd to replace its mounting robot. They have two alternatives for this:

- Robot A has an initial outlay of SEK 4,400,000. The economic life is 8 years on this one. The positive disposal value is SEK 600,000 after 8 years.
- Robot B has an initial outlay of SEK 3,500,000. The economic life is 5 years on this one. The positive disposal value is SEK 1,000,000 after 5 years.

The company uses an interest of 10 %. They estimate that the volume of production will, as earlier, be 2,000 units per year. The price per sold product is SEK 850 each. There are three yearly costs associated with the robot:

- The cost for material, energy and maintenance is SEK 100 per unit produced, and is the same for both alternatives
 - The cost for the operator that monitors and deal with the robot is SEK 600,000 per year, and is the same for both alternatives
 - The depreciation is, for the first five years, SEK 880,000 (SEK 4,400,000/5 years) for robot A, and SEK 700,000 (SEK 3,500,000/5 years) for robot B.
- a. What is the *present value* of *robot A*?
 - b. What is the *annuity* of *robot A*?
 - c. What is the *present value* of *robot B*?
 - d. What is the *annuity* of *robot B*?
 - e. What mounting robot should they *choose*, and *why*?
 - f. Some of the data that you included in the calculations for a-d above wasn't really needed for the decision in sub-question e as such. What data isn't needed, and why isn't that data needed?
 - g. In this problem, the payback period wasn't calculated. What two problems are there with the payback period calculations; Why shouldn't the payback period be used?
 - h. Give one example on a possible component of the positive disposal value.

6:16 Sargano Ltd

Saragano Ltd plan to invest in a new welding machine. It will replace an earlier one in a process that is planned to be going on in the foreseeable future. The cash inflow in the operations where the machine will be used is estimated to SEK 8,000,000 per year. The company uses an interest of 20 % for this type of investments with this risk. They choose between two alternative welding machines:

Machine A has an initial outlay of SEK 16,000,000, and an economic life of 8 years after which it need to be removed which results in a negative disposal value of SEK 7,000,000. It will give cash outflows in the form of wages, material, energy and such of SEK 2,500,000 per year.

Machine B has an initial outlay of SEK 11,000,000, and an economic life of 5 years after which it has a negative disposal value of SEK 5,000,000. It will give the same cash outflows for wages, material, energy and such as Machine A per year.

- a. What is the *present value of machine A*?
- b. What is the *annuity of machine A*?
- c. What is the *payback period of machine A*?
- d. What is the *present value of machine B*?
- e. What is the *annuity of machine B*?
- f. What is the *payback period of machine B*?
- g. What alternative should they *choose*? Also, indicate if it is the net present value, the annuity, and/or the payback period that is *relevant* to make this decision in this case; and why it is so
- h. We haven't calculated the *internal rate of return* in this problem. But if we would: What does the internal rate of return indicate or, in other words, how is the internal rate of return calculated? (you don't have to calculate the internal rate of return in this).

6:17 PansAB

PansAB plans to invest in a new manual crane for their customers to rent. The company has a demand on internal rate of 15 %, but are using the interest 12 % in their investment appraisal. The price for a manual crane is SEK 118,918. The economic life is estimated to six years for the crane, and during these years they estimate to get SEK 85,000 per year in rent payments each year except year 2 when it is estimated to be SEK 82,000 and year 3 when it is estimated to be SEK 88,000. The payments for salaries are estimated to SEK 30,000 per year, and the payments for maintenance of the crane are estimated to SEK 15,000 year 1, SEK 12,000 year 2, SEK 18,000 year 3, and SEK 15,000 each year 4, 5 and 6. The payments to transport the crane are estimated to SEK 6,000 each of the six years.

- a. What is the *present value* of this investment?
- b. Is the investment *profitable* according to the *net present value method*? Motivate your answer.
- c. What is the *annuity* of the investment?
- d. Is the investment *profitable* according to the *annuity method*? Motivate your answer
- e. Is the investment *profitable* according to the *internal rate of return*? It's enough to just answer yes or no to this, you don't have to find the exact internal rate of return, but you need to do at least one relevant calculation that motivates your answer
- f. What is the *pay-back time* of the investment?

- g. Why shouldn't *depreciation* be part of the investment calculation?
- h. A couple of years ago, PansAB asked some manufacturers to present an offer for a manual crane. One of the manufacturers, the one that PansAB later chose, invoiced PansAB SEK 1 000 for this. Why *shouldn't* this cash out be part of the investment appraisal?

6:18 Investos

Investos plan to invest in a new machine for construction purposes. It will replace an earlier one in a process that is planned to be going on in the foreseeable future. The cash inflow in the operations where the machine will be used is SEK 6,000,000 per year. The company uses an interest of 14 % for this type of investments. They depreciate machines with 25 % per year during four years. They choose between two alternative machines:

Alternative A has an initial outlay of SEK 12,000,000, and an economic life of 8 years after which it need to be removed which results in a negative disposal value of SEK 5,000,000. It will give cash outflows in the form of wages, material, energy and such of SEK 2,000,000 per year.

Alternative B has an initial outlay of SEK 8,000,000, and an economic life of 4 years after which it has a zero disposal value. It will give the same cash inflows for sells and cash outflows for wages, material, energy and such as Alternative A.

- a. What is the *present value of machine A*?
- b. What is a *present value*; how can such a value be *interpreted*?
- c. What is the *annuity of machine A*?
- d. What is an *annuity*; how can such a value be *interpreted*?
- e. What is the *net present value of machine B*?
- f. What is the *annuity of machine B*?
- g. What alternative should they *choose*? Also, indicate if it is the net present value, the annuity, or both of them that are *relevant* to make this decision in this case; and why it is so?
- h. We haven't calculated the pay-back time in this problem. But if we did: What are the *problems* with using the *pay-back method* for investment appraisal?

7. Following up the Business

7:1 Continuous questions

- a. Calculate the return on capital for your company, as we learn it in the course. Why is it calculated that way, and what does the measure indicate (in general and for your company)?
- b. Calculate the return on equity (ROE) and return on investments (ROI) of your company. What do these two measure?
- c. Calculate and discuss the liquidity in your company with the measures for this that we have learnt in the course
- d. Calculate the components of the DuPont formula for your company, and discuss it
- e. Calculate the equity ratio and the debt/equity ratio of your company, and discuss these values

7:2 Short questions

- a. The *auditor* should give her/his view about three things in the annual report (in the audit report). What are these three things?
- b. How is the *profit margin* calculated?
- c. How is the *quick ratio* calculated?
- d. What is the difference between *non-current assets* and *current assets*?
- e. What does the *prudence principle* imply for inventory?
- f. For whom do an *auditor* work in the first place?
- g. How is the *equity ratio* calculated?
- h. Name at least three *accounting conventions*
- i. Bookkeeping is noted in two different ways; one can say, in two different *books*. Name and define these books.
- j. What does the accounting principle *going concern* stand for?
- k. What meaning do the words *debit* and *credit* have, nowadays, in double-entry bookkeeping?
- l. Who choose the *auditor* of a company?
- m. What *result measure* (or what *numerator*) is used in the return on capital?
- n. How is the *current ratio* calculated?
- o. What is the demarcation between *non-current* and *current liabilities*?

7:3 Kept books

For each of the following transactions, state (by naming the accounts, and/or by using T-accounts) what *account* should be *debited*, and what account should be *credited* (all amounts in thousands SEK):

- a. Share capital of 100 is paid to the bank account
- b. 50 is taken from the bank account and placed in the cash box

- c. Material is bought for 10, paid from the bank account, and put into inventory
- d. Salary is paid from the bank account: 5
- e. Energy is paid by cash: 2
- f. Material for 30 is bought on credit and put into inventory
- g. Products are sold for 40, and the money goes to the bank account
- h. Products are sold for 20 on credit
- i. The material in f above is paid for by cash
- j. The customers pay the products in h above with cash

7:4 The DuPont-formula

In the course, we have discussed the so-called *DuPont*-formula. Describe it and explain the meaning of the ratios in it (what they say about the company).

7:5 Balansakten AB

Balansakten AB has total assets of SEK 3,000,000. Of this, the non-current assets are SEK 1,800,000 and the current assets SEK 1,200,000. Equity is SEK 500,000 and the non-current liabilities are SEK 1,200,000. The rest is current liabilities. The inventories are valued to SEK 400,000.

- a. Calculate the company's *quick ratio*
- b. Calculate the company's *current ratio*
- c. Calculate the company's *equity ratio*
- d. What do you *need to know* to be able to state whether the quick and current ratio in this company is enough? Why?
- e. What do you *need to know* to be able to state whether the equity ratio in this company is enough? Why?

7:6 The competitors

The following data refers to the two competing companies DEBAB and FEBAB (in thousand SEK):

| | DEBAB | FEBAB |
|--------------------|-------|-------|
| Sales | 5,000 | 8,000 |
| Profit before tax | 850 | 600 |
| Financial income | 500 | 250 |
| Financial expenses | 150 | 200 |
| Equity | 500 | 600 |
| Total capital | 2,000 | 1,600 |

Calculate a) profit margin, b) *asset turnover*, and c) *return on capital* for the two companies, and comment on this.

7:7 Nycklab

For Nycklab, the following information is presented for the year 2016:

| | | | |
|-------------------------------------|--------------|-----------------------------------|--------------|
| Non-current assets | 2,200 | Equity | 900 |
| - including machines and furnishing | 800 | - including share capital | 500 |
| Current assets | 1,400 | Non-current liabilities | 1,900 |
| - including accounts receivable | 200 | Current liabilities | 800 |
| - including inventory | 700 | | |
| Sum Assets | 3,600 | Sum Liabilities and equity | 3,600 |

- a. Calculate the *quick ratio* for Nycklab
- b. Calculate the *current ratio* for Nycklab
- c. Calculate the *equity ratio* for Nycklab
- d. For each of the measures in a-c above; discuss what they can be used for; what is the value of them?

7:8 Skakis AB

Skakis AB has presented the following statement of financial position for the last year (in MSEK):

| Assets | | | Equity and liabilities | |
|---------------------|------------|--|-------------------------|------------|
| Non-current assets | 300 | | Equity | 300 |
| Inventory | 100 | | This year's profit | 15 |
| Accounts receivable | 50 | | Non-current liabilities | 60 |
| Cash | 75 | | Current liabilities | 150 |
| <i>Sum</i> | <i>525</i> | | <i>Sum</i> | <i>525</i> |

For a to d below, you should 1) present a general formula, 2) calculate it, and 3) explain what the measure is for (what the purpose is with the measure)

- a. *Current ratio*
- b. *Quick ratio*
- c. *Equity ratio*
- d. Comment on the financial health of the company, from the analysis above

7:9 Cash flow analysis

In a cash flow analysis, it is described how cash and cash equivalents are affected by the net cash flow of the year. This affect comes from three different flows. Which are these three flows, and what is the content of each flow (give examples of their parts).

7:10 Eureka AB

Eureka AB wants you to help them with some *parts* of their *cash-flow analysis* for year 2016. The following information is given in thousand SEK. There has been no new share issue the actual years. The dividend paid during 2016 is 10. The statement of financial position follows:

| Assets | 2016 | 2015 | | Equity and liabilities | 2016 | 2015 |
|----------------------|------------|------------|--|-------------------------|------------|------------|
| Non-current assets | 300 | 400 | | Share capital | 400 | 400 |
| Inventories | 200 | 300 | | Profit for the year | 100 | 50 |
| Accounts receivables | 300 | 150 | | Non-current liabilities | 250 | 250 |
| Cash | 50 | 50 | | Current liabilities | 100 | 200 |
| <i>Sum</i> | <i>850</i> | <i>900</i> | | <i>Sum</i> | <i>850</i> | <i>900</i> |

And the income statement for 2016:

| | |
|------------------------------|------------|
| Revenue | 8,000 |
| Cost of sales | -7,790 |
| Depreciation | -60 |
| Taxation | -50 |
| <i>= Profit for the year</i> | <i>100</i> |

- a. What effect does the *change in inventories* have on the cash flow from *operating activities*?
- b. What effect does the *change in current liabilities* have on the cash flow from *operating activities*?
- c. What effect does the *change in non-current assets* have on the cash flow from *operating activities*?
- d. What is the cash flow from *investing activities*?
- e. What is the cash flow from *financing activities*?

7:11 Fearless

The company Fearless presents the following in their annual report, all in 1,000 SEK. They also mention that the dividend paid year 2016 is 50, that no new issues has been taking place, and that the operating cost includes depreciation of 200.

| Assets | 2016 | 2015 | Equity and liabilities | 2016 | 2015 |
|---------------------|---------------|--------------|--|---------------|--------------|
| Non-current assets | 7,350 | 4,500 | Share capital | 4,000 | 4,000 |
| Inventory | 2,700 | 2,650 | Non-restricted equity from earlier years | 2,350 | 0 |
| Accounts receivable | 820 | 860 | This year's profit | 2,600 | 2,400 |
| Cash | 80 | 90 | Non-current liabilities | 1,120 | 800 |
| | | | Accounts payable | 880 | 900 |
| <i>Sum</i> | <i>10,950</i> | <i>8,100</i> | <i>Sum</i> | <i>10,950</i> | <i>8,100</i> |

| | Year 2016 |
|-----------------------------|------------------|
| Operating income | 25,100 |
| - Operating cost | -22,000 |
| = Operating profit | =3,100 |
| + Financial income | + 500 |
| - Financial expenses | -1,000 |
| = <i>Profit of the year</i> | = 2,600 |

- Calculate the *quick ratio* for year 2016
- Calculate the *current ratio* for year 2016
- Calculate the *return on capital* for year 2016
- Calculate the *return on equity* for year 2016
- Calculate the *profit margin* for year 2016
- Calculate the *asset turnover* for year 2016
- Make a *cash-flow analysis* for year 2016

7:12 Håkan's bookkeeping

Below, you find five transactions in bookkeeping. For each of them, indicate:

- What the *cause* of the transaction is, e.g. "The company has paid a purchase of material in cash."
- How the *profit is affected* by the transaction; does the profit increase, decrease, or isn't the profit affected by it?
- Which of the following four *types of accounts* the account in italics belongs to: Is it an asset, a liability, a cost, or a revenue?
- What happens with the account in italics, that is, how this type of account is *affected* by such a transaction; does it increase or decrease?

- a. *Electricity debet*, Bank credit
- b. *Accounts payable debet*, Bank credit
- c. Accounts receivable debet, *Sales credit*
- d. *Cash box debet*, Bank credit
- e. *Loan debet*, Bank credit

7:13 Lisa keeps the books

Help Lisa book the following transactions: State by the use of T-accounts or in other suitable ways what account should be *debited*, and what account should be *credited*, and close the books following the instructions.

- a. Share capital of SEK 500,000 is paid to the bank account
- b. SEK 5,000 is taken from the bank account and placed in the cash box
- c. Material is bought for SEK 40,000. It is paid from the bank account and put into inventory
- d. Material is bought for SEK 2,000. It is paid by cash and put into inventory
- e. Material is bought for SEK 30,000 on credit and put into inventory
- f. The material in e above is paid for from the bank account
- g. Salary SEK 50,000 is paid from the bank account
- h. Products are sold for SEK 35,000. The customers pay for this by cash
- i. Products are sold for SEK 20,000. The customers pay for this to the bank account
- j. Products are sold for SEK 80,000 on credit
- k. The customers pay for the products in j above to the bank account
- l. Electricity SEK 1,000 is paid from the bank account
- m. The company receives an invoice for electricity SEK 3,000. It is not paid for yet
- n. The invoice in m above is paid from the bank account
- o. The inventory is worth SEK 5,000 according to a stocktaking
- p. Close the books by presenting an income statement and a balance sheet for the period
- q. What is the *profit or loss* for the period?

8. Analyzing Change

8:1 Continuous questions

- a. Give at least two examples on stepwise fixed costs in your company, and motivate this
- b. What are some variable costs in your company, and what happens with them outside the relevant area?

8:2 Short questions

- a. What is a *stepped (or stepwise) fixed cost*?
- b. What is a *decreasing variable cost*? Also, give an example of such cost
- c. “The total cost for this increases as the volume increases, but at a slower pace”. What do we call this *type of cost*?
- d. What is *the margin of safety*?
- e. What is the *relevant range* (also named the relevant area)?

8:3 Cost, cash out, and expensed cost

For each of the following, specify if it is a *cost (an outlay)*, a *cash out*, and/or an *expensed cost*. For each sub problem, you need to explain *why* it is/isn't a cost, a cash out, and an expensed cost.

- a. Depreciation on machines during the year
- b. Material bought on credit
- c. A machine is bought with cash
- d. A loan is amortized
- e. Material earlier bought on credit is now paid

8:4 Cost, cash out, expensed cost?

For each of the following, state if it is a *cost (an outlay)*; a *cash out*; and/or an *expensed cost* for the period (OBS; each post can be 1, 2 or all 3 of these!):

- a. Material is bought in cash
- b. Material is bought on credit
- c. The material in b above is paid
- d. The company pays this year's rent for the premises in cash
- e. A machine is bought in cash
- f. A machine is depreciated for a specific year
- g. The company is amortizing on a loan

8:5 Costs

Define the following concepts:

- a. *Expensed Cost*
- b. *Variable cost*
- c. *Relevant cost*
- d. *Opportunity cost*
- e. *Direct cost*

8:6 SvårAB

At SvårAB they conclude that the total cost for April, when the production was 15,000 units, was 55,000 SEK. In March, when the production was 16,000 units, the cost was 57,000 SEK. As far as they can see there was no other differences between the two periods.

- a. What is a *variable cost*?
- b. What is the *variable cost per unit of the company*?
- c. What is a *fixed cost*?
- d. What is the *fixed cost of the company*?

8:7 Slagverken

In the company Slagverken, the following data has been collected for two months:

| Month | Volume of production | Total revenues | Total costs |
|-------|----------------------|----------------|-------------|
| May | 5,200 units | SEK 390,000 | SEK 340,000 |
| June | 7,400 units | SEK 555,000 | SEK 406,000 |

- a. What is the *variable cost per unit*?
- b. What is the *fixed cost*?
- c. State some of the *prerequisites* that these calculations rest upon.

8:8 Rörfast AB

Rörfast AB, that only manufactures one type of product, had, in August, revenues of SEK 440,000, costs of SEK 450,000, and a production volume of 48,000 units. In November, the revenues were SEK 510,000, the costs SEK 441,000, and the production volume 46,200 units. There have been no changes in the operations besides of this during the periods (no machines bought and so on).

- a. What is the *variable cost per unit*?
- b. What is the *fixed cost*?
- c. Sometimes, the variable costs aren't proportional. What *two other types of variable costs* are there?

- d. Sometimes, the fixed costs aren't totally fixed. Explain (shortly) how a *semi-fixed cost behaves*

8:9 Fasta Rör AB

The company Fasta Rör AB is selling a product for SEK 20 each. In January, the total cost was SEK 1,630,000, and in February, the total cost was SEK 1,930,000. No other differences were found between the two periods except that the volume was 82,000 units in January and 102,000 units in February.

- a. What's the *variable cost per unit*?
- b. What's the *total fixed cost*?
- c. What's the *break-even point*?
- d. What's the *margin of safety*, in number of *units* as well as in *percent* in February?

8:10 Samsong

Samsong AB wants to divide their costs into fixed and variable costs. In January, the volume was 10,000 units, and the total costs were SEK 170,000. The revenues were SEK 240,000. In February, the volume was 8,000 units, and the total costs were SEK 160,000. The revenues were SEK 220,000.

- a. What is the *variable cost per unit*?
- b. What is the *fixed cost*?
- c. State some of the *prerequisites* that these calculations rest upon.
- d. Suppose that the company has a volume of 14,000 units in March. What is the *total cost for March*?

8:11 Säkerheten AB

Säkerheten AB produces a component for locks. The price that they take for this is SEK 30 each. They have fixed costs of SEK 2,400,000, and variable costs of SEK 22 each. Today they are selling 540,000 such components for locks each year.

- a. What is the *break-even point* (in volume)?
- b. What is the *safety margin* (in volume)?
- c. What is the *safety margin* in percent?

8:12 Industrialized organizations

What happens with costs and profit (loss) when a company is *automated* (or industrialized) compared to when it is not? Discuss this in text as well as with two diagrams; one for an automated company, one for a handicraft company

8:13 Selia

Selia AB manufactures one (only one) type of product. In January, the company had revenues of SEK 1,520,000, costs of SEK 1,137,500, and a production volume of 4,750 units. In February, they had revenues of SEK 1,360,000 SEK, costs of SEK 1,062,500 SEK, and a production volume of 4,250 units.

There have been no changes in the operations besides of this during the periods (e.g. no new employees recruited or so).

- a. What is the *variable cost per unit*?
- b. What is the *fixed cost*?
- c. What is the volume at the *break-even point* of the company?
- d. What was the *margin of safety in volume and in %* of the company in January?
- e. Give an example of something that could be an *irreversible semi fixed* (or *stepwise fixed*) *cost*, and explain how that cost changes (in total) as the volume changes.

8:14 Varfix Ltd

Varfix Ltd only manufactures one type of product. In August, the company had revenues of SEK 1,000,000, costs of SEK 965,000, and a production volume of 2,000 units. In September, the revenues were SEK 1,100,000, the costs SEK 1,013,000, and the production volume 2,200 units. There have been no changes in the operations besides of this during the periods (no machines bought or so on).

- a. What is the *variable cost per unit*?
- b. What is the *fixed cost*?
- c. What is the volume at the *break-even point* of the company?
- d. What was the *margin of safety in volume and in %* of the company in August?
- e. Sometimes, the variable costs aren't proportional. What *two other types of variable costs* are there? Give at least one example for each of these
- f. Sometimes, the fixed costs aren't totally fixed. Explain (shortly but with at least one example) how a *semi-fixed* (sometimes named *stepwise fixed*) *cost behaves*

9. Financing the Business

9:1 Continuous questions

- a. How could your company reason when it comes to its need for safety capital?
- b. Discuss the Net Asset Value of your company (per share, if applicable); you don't have to calculate it, but discuss what it is and what it could be valued at
- c. Calculate the working capital of your company, and discuss it
- d. What is the fixed capital and the working capital of your company? Discuss what these two means.
- e. How could the percentage method for calculation of the need for working capital be used by your company?
- f. How does your company's capital usage look like; what has your company invested in?

9:2 Short questions

- a. Give one example on what the *safety capital* should be used to cover for.
- b. How is *fixed capital* calculated?
- c. The *working capital* is calculated as the difference between... What?
- d. What is the term for the *difference* between current assets and current liabilities?
- e. Mention one way to *acquire equity*
- f. How is the *dividend yield* for a share calculated?
- g. The *capital requirement* of a company is the sum of fixed capital, working capital, and... what?
- h. Give one example of an *extra value* that could be part of the Net Asset Value for a company
- i. A company's *capital usage* consists of tangible assets, intangible assets, intellectual capital, and... what?
- j. What is the "price" in the P/E (Price/Earnings) calculation?

9:3 Measures for shares

How are the following measures *calculated*, and what *information* can they give?

- a. *Net asset value per share*
- b. *Equity per share*
- c. *P/E*
- d. *Earnings per share, EPS*
- e. *Dividend yield*

9:4 Semlan AB

Semlan AB reports the following information for this year:

| | |
|--|-----------|
| Additional value in assets (exceeding booked value) | 500,000 |
| Dividend per share | 40 |
| Equity, total | 1,000,000 |
| Liabilities, total | 1,100,000 |
| Market value per share | 220 |
| Number of shares | 20,000 |
| Result of the year, total | 1,400,000 |
| Salary, total | 440,000 |

Calculate and shortly discuss what each of the following concepts means:

- a. EPS, Earnings per share
- b. Equity per share
- c. P/E
- d. Net Asset Value per share
- e. Dividend yield

9:5 SnärtAB

How is the need for capital effected for the company SnärtAB by the following events (independent of each other)? To get points on the sub problems, you need to do three things; say if the need for capital is increased, decreased or not affected; shortly explain why it is so; and say if it is fixed capital and/or working capital that is affected.

- a. SnärtAB introduces a new product in its portfolio
- b. The inventories turnover rate increases
- c. SnärtAB buys a new lathe (a machine)
- d. The length of credit for accounts payable increase
- e. The length of credit for accounts receivable decrease

9:6 DASAB

For each of the events below in the company DASAB, state if the capital requirements increase, decrease or are unchanged.

- a. The accounts receivable time increases.
- b. The inventory turnover in the raw material inventory increases.
- c. The product range of DASAB increases with a new product.
- d. The average time in the raw material inventory decreases.
- e. The average time in the finished goods inventory decreases

- f. The accounts payable time increases
- g. DASAB invests in a new machine.
- h. DASAB is setting up a new production facility.
- i. DASAB is buying shares in another company.
- j. DASAB introduces stricter payment procedures, which means that customers pay faster.

9:7 Meroven Ltd

In Meroven Ltd, the following changes have occurred between two years:

- a. Accounts receivable have increased with SEK 120,000
- b. Accounts payable have increased with SEK 50,000
- c. Inventory has increased with SEK 70,000

For each of the changes, explain how it affects a) *working capital* and b) *cash and cash equivalents*. It is important that you not only *specify* the effect, but also explain *why* it is so.

9:8 Flödet HB

Flödet HB would like to have your help to calculate how much capital they are going to tie up. You have received the following information:

- They will buy one machine for SEK 500,000, and another machine for SEK 300,000.
- They plan to produce 1,300 units per day
- The material is used in the start of the production process, while the work is used up (evenly) day-by-day during the production process. The production time is 8 days for each unit
- SEK 15 of material and SEK 20 of work is used up for each produced unit. Both these amounts are cash outflows at the same amounts.
- The average time that material is stored in inventory is estimated to 20 days, and for finished goods in inventory 10 days
- The company wants to keep a safety capital of SEK 200,000
- The suppliers give 15 days of credit, and the customers are given 30 days of credit

- a. How much will the company tie up in *working capital*?
- b. How much will the company tie up in *total capital*?
- c. How much will the company tie up in *work*? How much will they tie up in *material*?

9:9 Röjmix AB

A newly started company, Röjmix AB, ask you to help them to calculate their capital requirement. You have received the following information:

They plan to buy machines for SEK 200,000. These machines will be used to produce 1,200 units of the product Strux each day. The labour cost is budgeted to SEK 5 per unit, and the cost for material per unit to SEK 42. The company receives a credit of on average 14 days from their suppliers of

material, and the company gives the same number of days in credit to their customers. The average number of days in raw material inventory is 10 days. After this, production starts, and this takes 2 days. The material is added directly at the start of the production process, while the work is added continuously during the production process. After the production, the products are kept in the finished goods inventory for on average 2 days before they are sold to the customers. The company also wants to have a security capital of SEK 50,000.

- a. Calculate *the average working capital requirement* for the company with the balance sheet method.
- b. Calculate *the total capital requirement* of the company.

9:10 Entender

You start a new operation that will produce Entender. For this, you buy machines for SEK 1,500,000, which are depreciated with 20 % each year. You estimate that you will need a safety capital of SEK 300,000.

The planned production is 800 units Entender each day during the first year. Each Entender means salary (that is added continuously during the production process) of SEK 50, and cost of material (that is added directly at the start of the production process) of SEK 35.

The raw material is placed in raw material inventory on average 12 days, and after this the production process of 6 days follows. When the product is finalized it is placed in the finished goods inventory and stays there for on average 30 days before it is delivered to the end customer.

You receive on average 15 days of credit from your suppliers, and you give your customers 30 days of credit.

Calculate the total average need of capital for this operation. Use the resource method for calculating the need for working capital.

9:11 TranasAB

TranasAB needs your help to calculate their need for capital for a new production plant. The need for fixed capital is estimated to be SEK 50,000,000, and the need for safety capital to be SEK 10,000,000. They plan to produce 1,300 units each day, at a cost of SEK 1,200 in work and SEK 400 in material per each. The material will be added in the beginning of the production process, and the work will be added continuously during the production process. The company estimate both the accounts payable time and the accounts receivable time to be on average 15 days. The production time is estimated to be 20 days on average, and the time in finished goods inventory to be 20 days on average. The raw material time is estimated to be 20 days on average.

Use the resource method for your calculations.

- a. What is the company's *need for working capital?*
- b. What is the company's *total need for capital?*

9:12 Mognertser

You will start a company that will produce Mognertser. You are planning to produce 400 units of the product per day during this first year. Each Mognerts means salary (that is added continuously during the production process) of SEK 30 and cost of material (that is added directly at the start of the production process) of SEK 50,

After on average 10 days in raw material inventory, the 5-day long production process follows. After this, the product is placed in the finished goods inventory, and stays there for on average 15 days before it is delivered to the customer. The suppliers give you a credit of on average 30 days, and you give your customers a credit of on average 20 days.

Calculate the average working capital requirement for this business using the balance sheet method!

9:13 Kapitalis AB

Kapitalis AB wants your help to calculate how much working capital they will bind. They want this information for each post in the balance sheet (the *balance sheet method*). Help them with this based on the following data:

Each unit of product requires materials for SEK 210 and work for SEK 120. They estimate to produce 50,400 units per year. The production time is expected to be 10 days on average. After production, the product is stored 10 days in the finished goods inventory on average. The material, which is stored 20 days on average in the raw material inventory, is added directly at the start of production; but the work is added continuously during the production time. The company will receive 15 days of credit from their suppliers, and will give their customers 30 days of credit.

9:14 KapitAB

KapitAB provides the following information for the calculation of their need for working capital:

The company produces 800 units of the product each day. Each unit uses raw material for SEK 220 and direct labor for SEK 180. All these components affect cash. The production time is 4 days for each unit, and the finalized product is stored on average 10 days. The customers gets 30 days of credit on average. The average time that raw material is stored in inventory is 20 days, and the supplier gives 14 days of credit. The material is used in the start of the production process, while the work is used up (evenly) day-by-day during the production process.

Calculate the need for working capital. Use the balance sheet method for this, so that each part of the balance sheet is calculated separately.

9:15 Brebro [20 points]

For each of the following independent events at the company Brebro AB, state if the need for working capital increase, decrease or is unchanged; and if the need for fixed capital increase, decrease or is unchanged; and motivate this for capital that increase or decrease (e.g.; if working capital neither increase nor decrease, you don't have to motivate this)

- a. The average time in the *raw material inventory* increase
- b. The *profit margin* increase from 10 % to 12 %
- c. The company plans to *buy shares* in another company as a long-time investment. The company doesn't ask for a loan or so from the bank for this.
- d. The company receives a *long term loan* from the bank.
- e. The customers of the company are *slower payers* than earlier despite repeated reminders.

9:16 The need for capital

For each of the events below, state if the need for working capital increase, decrease or is

unchanged, and if the need for fixed capital increase, decrease or is unchanged; and motivate this

- a. The inventory turnover rate increase but sales haven't changed
- b. The profit margin increase from 15 % to 20 %
- c. The old machine has broken, and the company will now invest in a replacement machine
- d. The average time in the raw material inventory increase
- e. The average time in the finished goods inventory decrease
- f. The accounts receivable time decrease
- g. The accounts payable time decrease
- h. The company plans to buy shares in another company as a long-time investment
- i. The company increase its product range with a new product
- j. The customers of the company are slower payers than earlier despite repeated reminders

9:17 Spanjilas AB

Spanjilas AB will start to produce Spanjils, which are applied at the customers' already working systems, and aims to increase both the range and the ability to share the frequencies. The company gives the following information for calculation of their need for capital:

The company will invest SEK 3,000,000 in facilities, and have been granted loans of SEK 2,500,000 from the bank for this. SEK 2,000,000 of this investment, which part mainly consist of the building, is depreciated on 20 years, while the rest of the investment, SEK 1,000,000, that consist of machines and such, is depreciated for 5 years. The company plan to produce 10 Spanjils each day. Each Spanjil needs material for SEK 2,400 and work in the form of direct salary for SEK 16,000. Both these means cash out with the same respective amounts. The production process takes 10 days per Spanjil, and the finished product is seldom put into inventory, but on average there is still a finished goods inventory time of 1 day due to that some products are put in to inventory, e g because of customers placing orders that are wrong and such. The company gives the customers 30 days of credit on average. The material is placed in the inventory for on average 10 days, and the suppliers gives 30 days of credit on average. The material is added directly at the start of the production process, and the salary continuously during the production process.

Spanjilas doesn't sell that good during the colder winter months, and mainly because of this the company estimates the need for safety capital to be SEK 1,000,000.

- a. What is the need for capital to cover *Raw material inventory*?
- b. What is the need for capital to cover *Work in progress*?
- c. What is the need for capital to cover *Finished goods inventory*?
- d. What is the need for capital to cover *Accounts receivable*?
- e. How much of the need for capital will the suppliers cover with *Accounts payable*?
- f. What is the total need for *Working capital*?
- g. What is the need for *Fixed capital*?
- h. What is the *Total* need for *capital*?
- i. What is the need for capital to cover for *Material* in the whole process?

9:18 Spunkis

Your company is planning to start a new operation for the production of Spunkis. For this, you plan to buy two machines: One for SEK 2,500,000, which is depreciated with 20 % each year, and one for SEK 1,400,000, which is depreciated with 10 % each year. You will get a loan of SEK 3,900,000 from the bank when buying the machines. You estimate that you will need a safety capital of SEK 500,000.

You plan to produce 5,000 units of Spunkis each day. Each Spunkis means salary (that is added continuously during the production process) of SEK 14, and a cost of material (that is added directly at the start of the production process) of SEK 50.

The raw material is placed in raw material inventory for on average 15 days, and after this the production process of 30 days follows. When the product is finalized, it is placed in to the finished goods inventory, and stays there for on average 20 days before it is delivered to the customers.

Your company receive on average 30 days of credit from your suppliers, and gives your customers 30 days of credit.

- a. What is the need for capital to cover *Raw material inventory*?
- b. What is the need for capital to cover *Work in progress*?
- c. What is the need for capital to cover *Finished goods inventory*?
- d. What is the need for capital to cover *Accounts receivable*?
- e. How much of the need for capital will the suppliers cover with *Accounts payable*?
- f. What is the total need for *Working capital*?
- g. What is the need for *Fixed capital*?
- h. What is the *Total* need for *capital*?
- i. What is the need for capital to cover for *Work* in the whole process?

9:19 Startertz Ltd

Startertz are planning to introduce a new product in their product portfolio: A type of Enervizer for Sveral Nurters. Help them to calculate their capital requirement from the following information:

They plan to buy machines for SEK 1,200,000. These machines will be used to produce 80 Enervizers per day. The labor cost is budgeted to SEK 430 per unit, and the cost for material to SEK 64 per unit. The company receives a credit of on average 30 days from their suppliers of material, and the company gives a credit of 30 days also to their customers. The average number of days in raw material inventory is 45 days. After this, production starts, and this takes 10 days. The material is added directly at the start of the production process, while the work is added continuously during the production process. After the production, the products are kept in the finished goods inventory for on average 20 days before they are delivered to the customers. The company also need to have a safety capital of SEK 200,000. They have been promised a loan of SEK 800,000 for the machines from the bank.

- a. What is the need for capital to cover for *Material* in the whole process?
- b. What is the need for capital to cover for *Work* in the whole process?
- c. What is the total need for *Working capital*?
- d. What is the total need for *Fixed capital*?
- e. What is the *Total* need for *capital*?

- f. Explain your answer in sub-question e above; what does that figure mean, what can Startertz do with this information?

9:20 The need for capital

For each of the events below, state if the need for working capital increase, decrease or is unchanged, and if the need for fixed capital increase, decrease or is unchanged; and motivate this

- a. The inventory turnover rate increase but sales haven't changed
- b. The profit margin increases from 15 % to 20 %
- c. The old machine has broken, and the company will now invest in a replacement machine
- d. The average time in the raw material inventory increase
- e. The average time in the finished goods inventory decrease
- f. The accounts receivable time decrease
- g. The accounts payable time decrease
- h. The company plans to buy shares in another company as a long-time investment
- i. The company increase its product range with a new product
- j. The customers of the company are slower payers than earlier despite repeated reminders

9:21 Rattarum

You will start a new operation for the production of Rattarum. For this, you plan to buy two machines: One for SEK 1,000,000, which is depreciated with 20 % each year, and one for SEK 800,000, which is depreciated with 10 % each year. You will get a loan of SEK 700,000 from the bank when buying the machines. You estimate that you will need a safety capital of SEK 200,000.

You plan to produce 24,000 units of Rattarum each day. Each Rattarum means salary (that is added continuously during the production process) of SEK 1.20, and a cost of material (that is added directly at the start of the production process) of SEK 2.40.

The raw material is placed in raw material inventory for on average 15 days, and after this the production process of 4 days follows. When the product is finalized, it is placed in to the finished goods inventory, and stays there for on average 30 days before it is delivered to the wholesalers (that then sells to end customers).

You receive on average 10 days of credit from your suppliers, and you give your customers (the wholesalers) 30 days of credit.

- a. What is the need for capital to cover *Raw material inventory*?
- b. What is the need for capital to cover *Work in progress*?
- c. What is the need for capital to cover *Finished goods inventory*?
- d. What is the need for capital to cover *Accounts receivable*?
- e. How much of the need for capital will the suppliers cover with *Accounts payable*?
- f. What is the total need for *Working capital*?
- g. What is the need for *Fixed capital*?
- h. What is the *Total* need for *capital*?

- i. What is the need for capital to cover for *Material* in the whole process?

1. The Business, Solutions

1:1 Continuous questions

- a. The business logics to choose between are: Producing and extracting raw materials; Manufacturing (Contract manufacturing, Labor-intensive processing plants, Capital-intensive processing plants, Assembly plants); Distribution of goods (Freight forwarding, Transshipping, Retailing); Basic common services (Organizations that exercise authority, Institutional services, Subscriber-related services); The service sector (Local manual services, Knowledge-intensive services, Local consumer establishments, Rental services, Teaching, Distance support, Artistry); Spidering (Contracting, Replicating, Brokering). Make sure the student has made one or more reasonable business logics for her/his company, and also discussed it/them in terms of characteristics, important measures and such for that company.

1:2 Short questions

- a. When more is produced, the *fixed cost per unit* decrease
- b. Contracting, replicating and brokering are the possible answers.

2. Planning the Business, Solutions

2:1 Continuous questions

- a. The concepts should be defined, e.g. "The basis for the goals of the business is the company's mission. The mission is what the company wants to accomplish, why it exists. It's about the overall purpose of the company. Not financial goals, but more how the company wants to change the world. This mission can then be translated into a vision; An idea of a possible future state. It shows where the company is heading and what it wants to achieve." Not exactly like that, but with the student's own words. The vision and the mission of the company, real or the student's thoughts on what it could be, should be presented, as well as some form of discussion/reflection on this (e.g. if it's good or bad, how well it fits to theory, or similar).
- b. Cost leadership means making sure to maintain low costs, for example by high volume, standardization, or similar. This will provide the opportunity for low prices. Differentiation means that the company highlights its unique advantages; that it for example of clients is perceived as the product with the best technology, the fastest car, the most luxurious brand or similar. Focus means to focus on a specific group of customers, to become the best choice for that customer by customizing the product for this group. It is important that the student motivates her/his choice, and also connects to the theory and include a discussion around this.
- c. The student should define this as e.g. that the activities performed are controlled. Examples could be locks on doors, login-codes for certain systems, and that what should be done and in what order is specified. Examples could be attendance requirement in courses, check lists for pilots before start, and so on. It's important that reasonable examples are given and discussed from the student's own company; how they do it or how they could do it.

2:2 Short questions

- a. Differentiation
- b. Strengths and weaknesses are seen as internal factors, opportunities and threats as external factors.
- c. Strengths, Weaknesses, Opportunities, and Threats.
- d. Market growth
- e. Efficiency is doing things right (running fast), effectiveness is doing the right things (running in the correct direction)
- f. Budgeted cash, budgeted income statement, and budgeted balance sheet
- g. The balanced scorecard has the vision and the strategies in the middle, and then four or five perspectives with suitable measures for them: The financial perspective, the internal business process perspective, the perspective of learning and growth, the customer perspective (and, not necessarily, the employee perspective)
- h. Advantages; i.e. that the employees can affect, a base for coordination, a base to follow up, supports delegation, creates cost awareness, and informs the employees. Disadvantages; i.e. takes a lot of time and resources, are never fulfilled, reduces possibilities, and can hamper in times of changes

- i. An idea of a possible future state. It shows where the company is heading and what it wants to achieve
- j. Visibility
- k. Timed (abbreviated as SMART measures)

3. Acting in the Market, Solutions

3:1 Continuous questions

- a. Make sure that there is a definition of the concept of place that fits with the intent of the model; e.g. that place is about how to get close to the customer in a way that they prefer and easily can buy our products. Also, that there is a discussion on how the company uses/can use this, e.g. that they place their points of sale close to the customers, that wholesalers and retailers distribute their products, that they sell their products by e-commerce, or similar. It's not enough with just a description of the model and the company's use of it as a chain of distribution; how place is used as a competitive tool should be in focus.
- b. The four types of markets are Perfect competition, Monopolistic competition, Oligopoly and Monopoly. These should be defined, and thereafter the student should choose one of them for the company, a product in the company or similar and it's important that there is a discussion around this market.
- c. Segmentation of products could mean e.g. that there are higher priced products with e.g. extra features or in smaller packages, and lower priced products with e.g. less functionality or in larger "economy packs". Segmentation of customers could mean e.g. that some customers are considered as premium or high price customers that are willing to pay the "normal" price or even more (e.g. at a more exclusive shop), and then price sensitive or low price customers that are willing to do the extra work to use discounts, coupons, to buy at more inconvenient times or places (like at sales, at evening bargains, at outlets and so on). Make sure the student discusses one or the other of this, and then also give an example on how it's done/could be done in the company.

3:2 Short questions

- a. Transactions marketing is about competing for customers through competition, while relationship marketing is about engaging and involving the customers
- b. Product, place, price and promotion
- c. Market economy and a planned economy
- d. When one seller dominates a market
- e. Based on cost
- f. Monopoly
- g. Oligopoly
- h. Monopolistic competition
- i. A form of market with only a few dominant sellers.
- j. Value-based (what is the value for the customer), competitor based (or market-based, and cost-based (e.g. full price, relevant cost or similar).
- k. To get close to the customer so that she prefers and easiest buys our product.
- l. Monopolistic competition
- m. That the company sets a low price to win the market as fast as possible
- n. E.g. by coupons, sales, evening bargains, outlets, or exclusive shops

o. Business to Business

4. Organizing the Business, Solutions

4:1 Continuous questions

- a. First, check that the student really discusses at least one organizational form, maybe even goes through several or all of them to explain the choice. And then focuses on one of them and points to its benefits for the company. It may be a line organization, which takes the functions into account and strengthens them, or perhaps a line and staff organization with advisory staffs, a process organization (value chain organization) that focuses on the customer process, the production process or similar, a matrix organization, or perhaps a functional organization where one employee can have multiple managers.

4:2 Short questions

- a. A revenue center has responsibility for its own resources as well as for its own costs, but not for the relation between them
- b. A manufacturing philosophy which shortens the time line between the customer order and the product shipment by eliminating waste
- c. An informal organization is how it works in reality, beyond the post description, the formal organization and so on. It is about who really decides, how the work is carried out in reality, and so on. Such aspects as culture, relations, networks, common and different interests, informal power, and other ways of power influence this.
- d. In a revenue center, the responsibility is also for revenues and costs but not the relation between them
- e. An employee can have more than one manager
- f. The decisional role
- g. One-piece process

5. Costing Products and Orders, Solutions

5:1 Continuous questions

- a. Indirect costs are costs that aren't booked directly on the product/order/project or similar. A definition like this is needed, and then also some examples on what could be indirect costs in the student's company. It's important that the examples are specific enough, e.g. salaries aren't specific enough but salaries for personal that doesn't work with a specific product, but e.g. supervising the work is a good example.
- b. In the solution, the student need to define the concepts, that direct labor is booked on each product, and machine cost is, for example, indirect salaries, equipment costs and similar in the production that is not direct. Examples can in the first case be piecework for the lathe operator or salary to employees that are programming code for a game that the company sell. And in the second example, the lathe or the computer that is used for programming can be examples, if it is used for multiple products.
- c. "Activity-based costing is a full cost system that start in the resources that cause the costs and records those that are relevant directly to the products. Those that are common (irrelevant; shared between two or more products) are first recognized on the activities (such as turning, painting, billing, sales) that consume them. And then the costs of that activity are distributed to the products using a driver. A driver is what causes the costs of an activity. It could be the number of lathe hours, the number of painted details, the number of sales orders, and the number of sales meetings respectively for the aforementioned activities. By dividing the cost of an activity with the number of the driver, a cost per driver is obtained. This cost per driver is then allocated to each product based on the number of drivers used by that product." With her/his own words, such a definition can be used in connection to the company. It's enough with two or more activities and drivers; activities and drivers that are relevant for the company that's discussed. No figures are needed but can of course be used.
- d. The examples should be costs that could arise in the sales activities, to show that the student can distinguish between costs in that way. In both groups, about the same items can appear, but in the first, sales overhead, such costs that aren't attributable to a specific product (salaries for administrative staff in the department, cost of sales systems and marketing systems, etc.), and in the latter direct sales costs, costs that can be attributed to a specific product (salaries to salesmen for selling product A, commissions to salesmen per product sold, travel costs in the marketing of a specific product, etc) should be the examples
- e. In the case we had the following activities/drivers: purchase/# orders, packaging of products/# packages, machine set up/# set-ups, machine calibration/# calibrations, machine maintenance/# stops. The student should choose and argue for two activities that are realistic in her/his company, and two drivers that are appropriate for these two activities (not only those that we discussed in the case). Why is this information better? Gives a more reasonable allocation of the cost, also complexity affects; use the language of the operations, gives data for simulations, etc.
- f. It's important that the student defines contribution margin as relevant revenues less relevant costs, e.g. the price of a product less its cost to buy for the company (what is dependent on the product). And then that this is multiplied with volume to reach the total contribution margin. Sometimes, also, there are fixed relevant costs that should be deducted from this total. Then, also, that the student gives an example from the company on contribution margin and total contribution margin.

- g. A process costing system is used when a company produces one single product or several products that are the same, that are produced in a continuous flow. In this, the cost is divided with the volume. There are several complications to this that the student could discuss, e.g. what volume that should be used, but this isn't necessary – the only important aspect on this is that the student understands what it is and can describe an example around it for a part of the company or for the company at large.
- h. The student needs to choose one of absorption costing (for e.g. orders/jobs, or custom-made products), activity-based costing ABC (as absorption costing but gives a more exact cost), process costing (when producing volumes of same products), equivalent units costing (as process costing, but the products differ in some substantial respect), joint product costing (when two or more products are produced in the same system in the same way), by-product costing (when they also get a by-product in the production of the main product), contribution margin costing (when there is a very large number of different products that would not be reasonable to calculate thoroughly one by one) or stepwise costing (as for absorption costing and activity-based costing but also supplemented with an analysis of the contribution margin). It's important that this is motivated; as above maybe, but more elaborated and in relation to the company. That's enough; it's a plus to elaborate with the implementation as well, but that is not needed for a pass.

5:2 Short questions

- a. An indirect cost is a cost that's not possible to assign to a specific product
- b. As the contribution margin divided with the price
- c. How to select, valuate and recognize (accrue)
- d. Return is profit (revenues less costs) divided with capital. That is, profit is absolute while return is relative.
- e. A cost that can be attributed directly to the costing object, e.g. to the products that are sold or to the projects that are being performed
- f. A cost that will be affected by a decision.
- g. It is the lost profit for a choice; when you choose to do something, you can't do something else, and the opportunity cost is what is lost in this way
- h. It is an historical cost; it has happened, and you can't do anything about it, so it shouldn't be part of your costing
- i. All the costs (all the direct and indirect costs)
- j. A costing model where different *equivalent factors* for products are used for cost components
- k. When each unit doesn't differ that much from the other units
- l. A costing system where the relevant costs (and/or the contribution margin) are calculated for different levels
- m. Drivers = the causes for activities = what is done, the verb
- n. A costing method, where relevant costs are subtracted from relevant revenues, which gives the contribution margin
- o. As the total cost divided with the volume produced
- p. Salary in production that is booked directly on e.g. a product

- q. A cost that is fixed within an interval of volume and raises with higher volumes
- r. What causes the costs of an activity
- s. The contribution margin ratio (or the gross margin, which is the same)
- t. When producing large volumes of same products
- u. It is a sales overhead if it isn't directly traced to a specific product (e.g. general marketing), and a direct sales cost if it is (e.g. a person selling only one of our products)
- v. Eg more reasonable allocation of the cost (with complexity taken into consideration), uses the language of the operations, gives data for simulations [two needed, could be other]

5:3 Grundet AB

- a. A machine cost; since it's indirect (used by all products) and occurs for manufacturing.
- b. A direct cost, since it relates to a specific product
- c. A sales overhead, since it's indirect (one seller for all products), and occurs for sale
- d. A material overhead, since it's indirect (used for purchased materials regardless of the product) and occurs for materials handling
- e. A machine cost, since it's indirect (used for production regardless of the product) and occurs for manufacturing

5:4 Spiken

Total cost/Actual volume = $(1,105,000 \text{ SEK} + 765,000 \text{ SEK})/85,000 \text{ boxes} = 22 \text{ SEK per box}$

5:5 Sfinxen Ltd

- a. $((\text{SEK } 3,150,000 + \text{SEK } 2,196,000)/19,800 \text{ units} = \text{SEK } 270 \text{ each})$
- b. That the company only produces one type of product, or that the costs for common resources without problems can be connected to the products (that the products use the same resources and are equally demanding on those).

5:6 Sjavaler

See below. The full cost is 121,000 SEK

| | | |
|---------------------------------|------------------------------|-------------|
| Direct material | 1,750 SEK x 20 units | SEK 35,000 |
| Material overhead | 40 % x direct material | SEK 14,000 |
| Direct wages | 2 hours x 250 SEK x 20 units | SEK 10,000 |
| Machine cost | SEK 800 x 10 hours | SEK 8,000 |
| Other direct production costs | | SEK 13,000 |
| = Production cost | | SEK 80,000 |
| Sales, General & Administrative | 45 % x production cost | SEK 36,000 |
| Direct sales costs | | SEK 5,000 |
| = Full cost | | SEK 121,000 |

5:7 Savox AB

The calculations can be found below:

| | Budget | Calculate | = | Cost | Order |
|--|----------------|-----------------|-----|--------------|---------------|
| Direct material | 140,000 | | | 5,000 | 5,000 |
| Material overhead | 28,000 | 28,000/140 | 20% | 5,000 x 20% | 1,000 |
| Direct wages | 40,000 | | | 10 x 600 | 6,000 |
| Machine cost | 88,000 | 88,000/880 | 100 | 132 x 100 | 13,200 |
| Production cost | 296,000 | | | | 25,200 |
| Sales, general and administrative overhead | 118,400 | 118,400/296,000 | 40% | 25,200 x 40% | 3,780 |
| Full cost | 414,400 | | | | 35,280 |
| Profit 10% | 41,440 | | | 35,280 x 10% | 3,528 |
| Price | 455,840 | | | | 38,808 |

- a. The full cost = SEK 414,400
- b. 20% on direct material for material overhead, SEK 100 per machine hour for machine cost, 40 % on production cost for sales, general and administrative overhead
- c. Price = SEK 38,808

5:8 Schyssta Altaner AB

- a. SEK 5,284,000 (SEK 2,400,000 + SEK 1,400,000 + SEK 476,000 + SEK 1,008,000)
- b. SEK 7,661,800 (SEK 5,284,000 + SEK 2,377,400)

c. *Materials overhead 42 % (SEK 1,008,000/SEK 2,400,000), Sales, general and administrative overhead 45 % (SEK 2,377,400/SEK 5,284,000), and Machine cost SEK 200 (SEK 476,000/2,380 hours)*

d. *SEK 105 908.* See calculations below.

| | |
|--|----------------------------------|
| Direct material | 42,000 |
| Material overhead | 17,640 (42 % of direct material) |
| Direct wages | 10,000 |
| Machine cost | 3,400 (17 hours x SEK 200) |
| Production cost | 73,040 |
| Sales, general and administrative overhead | 32,868 (45 % of product cost) |
| Full cost | 105,908 |

e. Depreciation on machines, supervisor's salaries, rent for the production facilities a s o.

5:9 Spalktyr AB

a. The charges are most often calculated during the budgeting process. Then, the budget for the different parts of the costing system is summarized: How much of e g direct material and material overhead are we budgeting for the year? Based on this, the charges are calculated as overhead/direct cost (or production cost, when applicable), e g total material overhead divided with total direct material for the year and cost per hour as machine cost divided with the planned number of machine hours.

b. The cost will be as follows:

| | | |
|--|--------------------------------|----------------|
| Direct material | SEK 480 x 100 units | 48,000 |
| Material overhead | 425 % x direct material | 12,000 |
| Direct wages | 10 hours x SEK 200 x 100 units | 200,000 |
| Machine cost | 40 hours x SEK 2,000 | 80,000 |
| Other direct production costs | | 10,000 |
| = Production cost | | 350,000 |
| Sales, general & administrative overhead | 50 % x production cost | 175,000 |
| Direct sales costs | | 20,000 |
| = Full cost | | 545,000 |

c. Answer: The full cost is SEK 545,000

5:10 Halkisar

The calculations follow:

| | Badrums | | Tvättstuge |
|------------------------|----------------------------|--------------------|----------------------------|
| Price | 340 SEK | | 180 SEK |
| - Relevant cost | -220 SEK | | -120 SEK |
| = Contribution | = 120 SEK | | = 60 SEK |
| # kilo | 1.2 kg | | 0.5 kg |
| Can produce | 8,000 kg/1.2 kg = | 6,666 # | 8,000 kg/0.5 kg = |
| Total contribut | 6,666 # x 120 SEK = | 799,920 SEK | 16,000 # x 60 SEK = |
| | | | 960,000 SEK |
| Contribution/kg | 120 kr/1.2 kg = | 100 SEK | 60 SEK/0.5 kg = |
| | | | 120 SEK |

- a. *Tvättstugehalkis.* This product gives the *highest total contribution margin* (SEK 960,000 against SEK 799,920), and the *highest contribution per kilo material* (SEK 120 against SEK 100)
- b. A cost that *that is added or omitted through the decision*

5:11 BegränsAB

- a. They should produce 2,000 Räns, since this gives the highest total contribution margin (SEK 70,000 compared to SEK 640,000 for Beg). The calculations can be found below.

| | | Beg | | Räns |
|---------------------------------------|--------------------|----------------|--------------------|----------------|
| Price per unit | | 2,120 | | 800 |
| - Variable relevant cost per unit | | -840 | | -450 |
| = Contribution margin per unit | | 1,280 | | 350 |
| Hours of production per unit | | 4 | | 1 |
| = possible | 2,000/4 | 500 | 2,000/1 | 2,000 |
| = Total contribution margin | 500 x 1,280 | 640,000 | 2,000 x 350 | 700,000 |
| Contribution margin per hour | 1,280/4 | 320 | 350/1 | 350 |

- b. They should produce 3,000 Beg, since this gives a higher total contribution margin (3,000 units x SEK 1,280 = SEK 3,840,000) than if 3,000 Räns were produced (3,000 units x SEK 350 = SEK 1,050,000). The same can be found by looking at the contribution margin per unit (SEK 1,280 compared to SEK 350) since the number of units is the factor that limits in this case.
- c. If there is more than one factor that limits at the same time, e.g. if both material and number of production hours should be limited.

5:12 Trångt

The calculations can be found below:

| | | | | |
|--|--|---|--|---|
| | | A | | B |
|--|--|---|--|---|

| | | | | |
|--|-------------------|---------------|--------------------|---------------|
| Price/unit | | 150 | | 210 |
| Variable relevant cost/unit | | -60 | | -110 |
| Contribution margin/unit | | 90 | | 100 |
| Kg/unit | | 2 | | 2,5 |
| = Possible production | $1,500/2 =$ | 750 | $1,500/2.5 =$ | 600 |
| = Total contribution margin | $750 \times 90 =$ | 67,500 | $600 \times 100 =$ | 60,000 |
| Contribution margin/kg material | $90/2 =$ | 45 | $100/2.5 =$ | 40 |

They should produce 750 units of Type A and 0 units of Type B. This is because this gives the highest total contribution margin (SEK 67,500 compared to SEK 60,000 if Type B was produced). The same can be found by comparing the contribution margin per kilo material (SEK 45 per kilo for Type A compared to only SEK 40 per kilo for Type B).

When 750 units of Type A has been produced there is no material left, and no more Type A or B can be produced.

5:13 HabroVink AB

Answer: They should produce 0 Habro and 20 000 Vink. This can be found both by the fact that Vink gives a higher contribution margin per kilo material (SEK 400 compared to SEK 350), and by the fact that Vink gives a higher total contribution margin (SEK 11,600,000 compared to SEK 10,150,000). The calculations can be found below:

| | | Habro | | Vink |
|--|-----------------------|-------------------|-----------------------|-------------------|
| Price/unit | | 1,000 | | 800 |
| Variable relevant cost/unit | | -300 | | -220 |
| Contribution margin/unit | | 700 | | 580 |
| Kg/unit | | 2 | | 1,45 |
| = Possible production | $29,000/2 =$ | 14,500 | $29,000/1.45 =$ | 20,000 |
| = Total contribution margin | $14,500 \times 700 =$ | 10,150,000 | $20,000 \times 580 =$ | 11,600,000 |
| Contribution margin/kg material | $700/2 =$ | 350 | $580/1.45 =$ | 400 |

5:14 ChoicesAB

- a. They should accept B, C, D, E, G, H and I
- b. Because they give a positive contribution margin (more in relevant revenues (price) than they cost in relevant costs).
- c. The cost that is relevant for a decision; that effects the result of the business from a decision

- d. *The total cost* of a cost object (e.g. a customer request), including irrelevant as well as relevant costs
- e. Information about the *constraint*, as well as *how much each request needs* of the constrained resource, is needed.

5:15 Bodyworks Ltd

First, some calculations:

| | Arms | Legs | total | |
|---|---------|--------|--------|---------|
| Contribution margin per unit (price – variable relevant cost) | 80 | 40 | | SEK |
| <i>If machine hours are scarce:</i> | | | | |
| Available machine minutes (hours x 60) | | | 30,000 | minutes |
| Contribution margin per machine minute | 8 | 1 | | SEK |
| Possible production | 3,000 | 750 | | units |
| Possible contribution margin (units x contribution margin) | 240,000 | 30,000 | | SEK |
| <i>If kg material is scarce:</i> | | | | |
| Contribution margin per kg material | 40 | 80 | | SEK |
| Possible production | 500 | 2,000 | | units |
| Possible contribution margin (units x contribution margin) | 40,000 | 80,000 | | SEK |

- a. Arms, since this product has the highest contribution margin per machine minute (SEK 8 compared to SEK 1 per minute). Can also be answered with the highest possible total contribution margin (SEK 240,000 compared to SEK 30,000)
- b. Legs, since this product has the highest contribution margin per kg material (SEK 80 compared to SEK 40 per kg material). Can also be answered with the highest possible total contribution margin (SEK 80,000 compared to SEK 40,000)
- c. If material is scarce, Legs should be produced in the first place (see B). We use up 500 kg of material for 1,000 Legs (1,000 Legs x 0.5 kg per Leg), so we have 500 kg left. For this, we can produce 250 Arms (500 kg/2 kg per unit). So, the answer is that they should produce 1,000 Legs and 250 Arms.
- d. Maybe the company can only sell as many Arms as they sell Legs? This could be the case e.g if the customers need both Arms and Legs of the same kind to a doll.

5:16 Kvadraten AB

- a. They should use equivalent costing

- b. Because it is a type of process costing with similar products (the cost should be divided with number of units), but the units have a difference when it comes to cost usage and this must be dealt with. Equivalent costing takes such differences into account.
- c. The calculations can be seen in the table below. The cost for each Aztec is SEK 100, for each Baztec SEK 140, and for each Caztec SEK 180.

| Product | m ² | Quantity | Equivalents (m ² x quantity) | Allocated cost (equivalents/tota l equivalents) x total cost | Cost each (allocated cost/quantity) | Direct cost each | Total cost each |
|------------|----------------|---------------|---|---|---|------------------------|-----------------------|
| Aztec | 2 | 10,000 | 20,000 | 800,000 | 80 | 20 | 100 |
| Baztec | 3 | 2,000 | 6,000 | 240,000 | 120 | 20 | 140 |
| Caztec | 4 | 8,000 | 32,000 | 1,280,000 | 160 | 20 | 180 |
| <i>Sum</i> | | <i>20,000</i> | <i>58,000</i> | <i>2,320,000</i> | | | |

5:17 Valenta AB

We can construct the following table with calculations:

| Product | Equivalent | Units | Sum of equivalents SOE, (Equivalent x Units) | Share of cost (SOE/Σ SOE) x 2,920,000 | Cost per unit (Share of cost/Units) |
|---------|------------|--------------|--|---|--|
| A | 3.5 | 1,200 | 4,200 | 420,000 | 350 |
| B | 7 | 2,200 | 15,400 | 1,540,000 | 700 |
| C | 12 | 800 | 9,600 | 960,000 | 1,200 |
| | Σ | 4,200 | 29,200 | 2,920,000 | |

Added to this is also the wage cost of SEK 700, which gives SEK 1,050, SEK 1,400, and SEK 1,900 respectively.

Answer; the total cost per unit amounted to SEK 1,050 per Valent A, SEK 1,400 per Valent B, and SEK 1,900 per Valent C.

5:18 Boranza nostalgia

We start with the budget:

| | |
|-----------------------------------|---------------|
| + Direct material | SEK 1,000,000 |
| + Material overhead | SEK 400,000 |
| + Direct wages | SEK 2,000,000 |
| + Production overhead | SEK 2,400,000 |
| + Special direct production costs | SEK 200,000 |
| = Production cost | SEK 6,000,000 |
| + Administrative overhead | SEK 1,200,000 |
| + Sales overhead | SEK 3,000,000 |

| | |
|------------------------------|----------------|
| + Special direct sales costs | SEK 500,000 |
| = Full cost | SEK 10,700,000 |

So:

- a. The budgeted production cost of the year = SEK 6,000,000.
- b. The budgeted full cost of the year = SEK 10,700,000.
- c. The overhead charges that the company should use is for: *Materias overhead 40 % (SEK 400,000/SEK 1,000,000)*, *Production overhead 120 % (SEK 2,400,000/SEK 2,000,000)*, *Administrative overhead 20 % (SEK 1,200,000/SEK 6,000,000)*, and *Sales overhead 50 % (SEK 3,000,000/SEK 6,000,000)*

And with this, we can now cost the order:

| | | |
|-------------------------------------|------------------------|-------------------|
| + Direct material | SEK 50 x 150 units | SEK 7,500 |
| + Material overhead | 40 % x Direct material | SEK 3,000 |
| + Direct wages | | SEK 10,000 |
| + Production overhead | 120 % x Direct labor | SEK 12,000 |
| + Special direct production costs | (machine set up) | SEK 8,000 |
| = Production cost | | SEK 40,500 |
| + Administrative overhead | 20 % x Production cost | SEK 8,100 |
| + Sales overhead | 50 % x Production cost | SEK 20,250 |
| + Special direct sales costs | | SEK 0 |
| = Full cost | | SEK 68,850 |

- d. The full cost of the order = SEK 68,850.
- e. Examples can be the rent for the inventory, salaries to trolley drivers, salaries for purchasers, the cost for inventory systems, and so on; if it isn't booked on a specific product (which most often means that it isn't used by a single product but by several or all the products of the company).

5:19 Egnakost nostalgia

We start with the budget:

| | |
|--|-----------------------|
| Direct material | SEK 5,200,000 |
| Material overhead | SEK 1,300,000 |
| Direct wages | SEK 4,000,000 |
| Production overhead | SEK 8,000,000 |
| Other direct production costs | SEK 500,000 |
| = Production cost | SEK 19,000,000 |
| Sales, general and administrative overhead | SEK 3,800,000 |
| Other direct sales costs | SEK 1,000,000 |
| = Full cost | SEK 23,800,000 |

So:

- a. Production cost = SEK 19,000,000

- b. Full cost = SEK 23,800,000
- c. Overhead charges: *Material overhead 25 % (SEK 1,300,000/SEK 5,200,000), Production overhead 200 % (SEK 8,000,000/SEK 4,000,000), and Sales, general and administrative overhead 20 % (SEK 3,800,000/SEK 19,000,000)*

And then, the order for model Y5 with the direct costs and the overhead charges:

| | | |
|--|----------------------------------|-------------|
| Direct material | SEK 100 x 2,500 units | SEK 250,000 |
| Material overhead | 25 % x direct material | SEK 62,500 |
| Direct wages | 10 minutes x SEK 5 x 2,500 units | SEK 125,000 |
| Production overhead | 200 % x direct labor | SEK 250,000 |
| Other direct production costs | (machine set-up) | SEK 40,000 |
| = Production cost | | SEK 727,500 |
| Sales, general and administrative overhead | 20 % x production cost | SEK 145,500 |
| Other direct sales costs | (sales bonus) | SEK 30,000 |
| = Full cost | | SEK 903,000 |

- d. Full cost = SEK 903,000
- e. A high rate for production overhead means that products that have a high cost of direct wages receive a larger proportion of that overhead. If the relation between the two is correct this is not a problem, but if it isn't (if the products that uses a lot of labor doesn't use more of what is in production overhead, e.g. machines and production premises) it gives a fault in the cost figures.

5:20 SunMoon AB (20 exam points)

The calculations for A, C and D can be found in the table below:

| | Sun | Moon | Total | |
|--|---------|-----------|-------|-------|
| Price | 22 000 | 12 000 | | SEK |
| Variable relevant cost | 6 000 | 2 000 | | SEK |
| => Contribution per unit | 16 000 | 10 000 | | SEK |
| <i>If number of design hours are scarce:</i> | | | | |
| Available design hours | | | 500 | hours |
| Design hours per unit | 10 | 10 | | hours |
| Contribution per design hour | 1 600 | 1 000 | | SEK |
| Possible production | 50 | 50 | | units |
| Possible total contribution (units x contribution) | 800 000 | 500 000 | | SEK |
| <i>If number of input hours are scarce:</i> | | | | |
| Available input hours | | | 1 000 | hours |
| Input hours used per unit | 25 | 10 | | hours |
| Contribution per input hour | 640 | 1 000 | | SEK |
| Possible production | 40 | 100 | | units |
| Possible total contribution (units x contribution) | 640 000 | 1 000 000 | | SEK |

- a. They should provide System Sun, since this gives the highest total contribution margin (SEK 800,000, compared to SEK 500,000 for System Moon). This can also be solved by

looking at the contribution margin per design hour, which is also higher for System Sun (SEK 1,600) compared to System Moon (SEK 1,000)

- b. Since System Sun is the most profitable per design hour, they should provide all 40 sellable systems of this. Then they are left with $(500 - 40 \times 10 \text{ hours}) = 100$ hours, for which they can produce $(100 \text{ hours} / 10 \text{ hours}) = 10$ of System Moon.
- c. They should produce System Moon, since this gives the highest total contribution margin (SEK 1,000,000, compared to SEK 640,000 for System Sun). This can also be solved by looking at the contribution margin per design hour, which is also higher for System Moon (SEK 1,000) compared to System Sun (SEK 640)
- d. See the answers in A and C
- e. A relevant cost is a cost that changes with the decision; if the decision is taken, the cost change. An allocated cost is an irrelevant cost that has been allocated, booked, on the product by some measure.

5:21 Ramborini Ltd (20 exam points)

The calculations can be found in the table below:

| | Aboner | Bejoner | Total | |
|--|-----------|-----------|--------|----------|
| Price | 4 000 | 2 000 | SEK | |
| Variable relevant cost | 1 800 | 1 400 | SEK | |
| => Contribution per unit | 2 200 | 600 | SEK | |
| <i>If machine hours are scarce:</i> | | | | |
| Available machine hours | | | 800 | hours |
| Available machine minutes | | | 48 000 | minutes |
| Machine time per unit | 40 | 20 | | minutes |
| Contribution per machine minute | 55 | 30 | SEK | |
| Possible production | 1 200 | 2 400 | | units |
| Possible total contribution (units x contribution) | 2 640 000 | 1 440 000 | SEK | |
| <i>If kg material is scarce:</i> | | | | |
| Available material | | | 2 000 | kilogram |
| Material used per unit | 4 | 2 | | kilogram |
| Contribution per kg material | 550 | 300 | SEK | |
| Possible production | 500 | 1 000 | | units |
| Possible total contribution (units x contribution) | 1 100 000 | 600 000 | SEK | |

- a. They should produce Aboner, since this gives the highest total contribution (SEK 2,640,000, compared to SEK 1,440,000 for Bejoner). This can also be solved by looking at the contribution per machine minut, which is also higher for Aboner (SEK 55) compared to Bejoner (SEK 30)
- b. Since Aboner are the most profitable per machine minut, they should produce all 1,000 sellable products of this. They are then left with $(48,000 - 1,000 \times 40 \text{ minutes}) = 8,000$ minutes, for which they can also produce $(8,000 \text{ minutes} / 20 \text{ minutes}) = 400$ Bejoner. The answer is, therefore, that they should produce 1,000 Aboner and 400 Bejoner.
- c. They should produce Aboner, since this gives the highest total contribution (SEK 1,100,000, compared to SEK 600,000 for Bejoner). This can also be solved by looking at the contribution per kilo of material, which is also higher for Aboner (SEK 550) compared to Bejoner (SEK 300)
- d. Since Aboner are the most profitable per kilo of material, they should produce these in the first place. As can be seen in the table above, the material is enough for producing 500 Aboner. That's less than what can be sold (1,000 units), which means that there is no material left to produce Bejoner with. The answer is, therefore, that they should produce 500 Aboner and 0 Bejoner.
- e. See the answers in a and c above

5:22 Garqso Ltd (20 exam points]

The calculations can be found below

- The total production cost is *SEK 10,000,000* according to budget
- The total full cost is *SEK 17,500,000* according to budget
- The company should use *20 % for material overhead, 60 % for sales, general and administrative overhead, and SEK 550 per machine hour*
- The full cost of the order is *SEK 184,500*
- Direct costs are recorded directly to what is sold, e g products, while overhead costs (indirect costs) are first recorded on a department (the department that use the resource) and then allocated to e g the product in an arbitrary way.
- E g bonus to sales personal for specific products, commercials for specific products, and so on.

| | Budget | Calculate | % or SEK | Order | Cost |
|--|------------|----------------|----------|--------|---------|
| Direct material | 4,200,000 | | | 86,000 | 86,000 |
| Material overhead | 840,000 | 840/4,200 = | 20 % | | 17,200 |
| Direct wages | 2,100,000 | | | 5,000 | 5,000 |
| Machine cost | 2,310,000 | 2,310/4,200 = | SEK 550 | 10 | 5,500 |
| Other direct production costs | 550,000 | | | 1 300 | 1,300 |
| = Total production cost | 10,000,000 | | | | 115,000 |
| Sales, general and administrative overhead | 6,000,000 | 6,000/10,000 = | 60 % | | 89,000 |
| Direct sales costs | 1,500,000 | | | 500 | 500 |
| = Total full cost | 17,500,000 | | | | 184,500 |

5:23 Lackerian AB

- The total production cost is *SEK 8,000,000* according to budget
- The total full cost is *SEK 11,600,000* according to budget
- The company should use *50 % for material overhead, 45 % for sales, general and administrative overhead, and SEK 750 per machine hours*
- The full cost of the order is *SEK 290,000*
- The company should offer the price *SEK 319,000* for this order
- In direct material, material that is booked directly on specific products are included, e g the paint that is used. In materials overhead, both material that are not booked on specific products and costs that are related to direct material as costs for procurement, for inventories and so on are included.

The calculations can be found below

| Budget | Calculate | % or SEK | Order | Cost |
|--------|-----------|----------|-------|------|
|--------|-----------|----------|-------|------|

| | | | | |
|--|------------------|-----------------|---------------|---------------|
| Direct material | 2,500,000 | | 60,000 | 60,000 |
| Material overhead | 1,250,000 | 1,250/2,500 = | 50 % | 30,000 |
| Direct wages | 1,500,000 | | 45,000 | 45,000 |
| Machine cost | 1,500,000 | 1,500/2,000 = | SEK 750 | 60 |
| <u>Direct consultancy costs</u> | <u>1,250,000</u> | | <u>20,000</u> | <u>20,000</u> |
| = Total production cost | 8,000,000 | | | 200,000 |
| Sales, general and administrative overhead | 3,600,000 | 3,600/8,000 = | 45 % | 90,000 |
| = Total full cost | 11,600,000 | | | 290,000 |
| Profit | 1,160,000 | (10 % x 11,600) | 10 % | 29,000 |
| = Sales and price | 12,760,000 | | | 319,000 |

5:24 Tolknar AB

| | | |
|--|----------------------------------|---------------|
| Direct material | 50 SEK x 3,000 units | 150,000 SEK |
| Material overhead | 40 % x direct material | 60,000 SEK |
| Direct wages | 16 minutes x 4 SEK x 3,000 units | 192,000 SEK |
| Machine cost | 192 hours x SEK 1,000 | 192,000 SEK |
| Other direct production costs | | 56,000 SEK |
| = Production cost | | 650,000 SEK |
| Sales, general & administrative overhead | 70 % x production cost | 455,000 SEK |
| Direct sales costs | | 80,000 SEK |
| = Full cost | | 1,185,000 SEK |

The full cost is SEK 1,185,000 for the order and SEK 395 per unit (SEK 1,185,000 /3,000 units = SEK 395 per unit)

6. Decisions about Investments, Solutions

6:1 Continuous questions

- a. All four categories of investments should be part of the answer, and it should be one and the same investment for all these four. Please note that investment in the environment is NOT defined by a lack of cash in and that it has its own budget. Also make sure that it really is an investment that is dealt with - not a regular cost like e.g. short-term sale activities, daily production, and so on.
- b. The student needs to explain the economic life (how long it is financially feasible to have the investment), the interest (an expression of the opportunity cost of capital, or the required returns, perhaps including risk, or the like), cash in (often price per unit produced in the investment x number produced), cash out (e.g. electricity, repairs, wages, materials, inventory used in the investment; it is important that e.g. depreciation is not a part since it is a cost but not a payment) and disposal value (a positive or negative payment that arises when the investment is dismantled, e.g. scrapping value, the cost of transporting it away, or the like. It's important that the student gives a reasonable example from the company s/he studies.
- c. The initial outlay is what is needed for the investment to start using it, and is often the payment for the machine, property or whatever it's that we are investing in that appears year zero. A definition of that kind is needed, and discussions and reflections on possible initial outlay in the company at hand.
- d. Riskier would be to go into a whole new market, invest in an entirely new product, and so on. Less risky might be to replace the old lathe with a new one, to invest in a new variant of an existing product, etc. The interest is then set as the nominal interest plus the risk (or the real interest plus inflation plus risk); make sure that the student understands that there is a risk component that is higher for riskier investments and therefore makes the interest higher for those.
- e. There are two alternatives for this classification, and the student can choose anyone of them. The student should connect to the company, but it can be good guesses – it doesn't have to be completely correct. It's important that the student gives examples from her/his company so that it's not just the categories below. Alternative 1, divide into different objectives; replacement investments, expansion investments, rationalization investments, and investments in internal and external environment. Alternative 2, divide from the balance sheet; property, plant and equipment (buildings and machines), intangible (trademarks, goodwill and patents) and financial (shares, bonds and other securities). Note that the text in the brackets are only examples, there might be other examples there
- f. First, make sure the student explains how interest is calculated as the real interest (the general increase in wealth) plus the inflation (how much prices rise on average) plus the risk associated with this particular investment. There are many examples on risks, some examples of categories (from Atlas Copco) include financial risks, reporting risks (tax), risks in the market, product development risks, production risks, distribution risks, supply chain risks, legal risks and compliance, risks with acquisitions and divestments, employee risks, risks to reputation, IT risks, safety and health risks, environmental risks, risks of corruption and fraud, and human rights risks. It's enough with two or more examples on risks that could be possible in the business in which the company acts, make sure that they are more specific or discussed than the broader categories above.

6:2 Short questions

- a. Replacement investments
- b. Risk (compensation)
- c. It doesn't take what happens the years after the pay-back period into account
- d. To make cash flows in different periods comparable
- e. Replacement investment, rationalization investment, environmental investment (internal or external environment).
- f. Trademarks, goodwill, or patents.
- g. That the risk and uncertainty is low, since the company already have the same type of investment
- h. The weighted Average Cost of Capital
- i. Technical life is the number of years that a machine can be used, economic life is the number of years that it is economically sound to use a machine
- j. What is needed for the investment to start using it
- k. When future payments are moved to time zero; the moment when the investment starts to be used, with the help of interest

6:3 IntrovertAB

- a. – Initial outlay SEK 1,000,000 kronor + yearly cash flow SEK 250,000 x sum of present value formula $((1-(1+0.08)^{-8})/0.08$ – disposal value SEK 1,000,000 kronor x present value formula $1/((1+0.08)^8) = -SEK\ 103,609$. *No, the investment is not profitable.*
- b. – Net present value SEK 103,609 x annuity formula $0.08/(1-(1+0.08)^{-8}) = -SEK\ 18,030$
- c. The payback period is 4 years (initial outlay SEK 1,000,000/yearly cash flow SEK 250,000).
- d. Total cash inflows = (SEK 500,000 kronor x 8) = SEK 4,000,000. Total cash outflows = (SEK 250,000 x 8 + initial outlay SEK 1,000,000 + disposal value SEK 1,000,000) = SEK 4,000,000. Thus; at 0% interest rate, the net present value is 0, because then the net is SEK 4,000,000 – SEK 4,000,000 = 0. Answer: *The internal rate of return is 0%.*

6:4 Fruttsvarv

- a. SEK 12,000 x 12 months = *SEK 144,000*
- b. First, the disposal value is calculated to its net present value: SEK 150,000 x present value formula $1/((1+0.10)^{10}) = SEK\ 57,831$. Then, the net present value is summarized (SEK 57,831 – SEK 840,000 in initial outlay) = SEK 782,169. Then the annuity of this value is calculated: SEK 782,169 x annuity formula $0.10/(1-(1+0.10)^{-10}) = SEK\ 127,294$
- c. Fruttsvarven should be *bought*, since this gives the lowest yearly cost (SEK 127,294 against SEK 144,000)

6:5 Falsetterna AB

- a. – Initial outlay SEK 620,000 + yearly cash flow the first four years SEK 240,000 (SEK 320,000 – SEK 80,000) x sum of present value formula $((1-(1+0.12)^{-4})/0.12$ + last year's cash flow SEK

20,000 (cash in SEK 150,000 – cash out SEK 80,000 – negative disposal value SEK 50,000) x present value formula $1/(1+0.12)^5 = \text{SEK } 120\,312$ kronor. Since the NPV is positive, the company should invest in the machine.

- b. The net present value SEK 120,312 x the annuity formula $0.12/(1-(1+0.12)^{-5}) = \text{SEK } 33,376$. Since the annuity is positive, the company should invest in the machine.
- c. The payback period is 2,58 years (initial outlay SEK 620,000/yearly cash flow (the first four years) SEK 240,000). Since the pay-back period is shorter than the demand for 3 years, the company should invest in the machine.
- d. Yes. The NPV is positive at 12%, and therefore it will be even more positive at 8% (SEK 188,522 as calculated). Therefore, the company should invest in the machine: The internal rate of return is above the limit
- e. The word is used when "costs" to stop operations are discussed. But actually, it is cash flow rather than costs that are interesting. Since we take interest into account, the time for the payment is interesting. E g if the company that takes care of the machine after operations is paid later, e g 2 years after the operations seize, the cash outflow happens year 7 instead of year 5.

6:6 Nyinvest AB

- a. – Initial outlay SEK 500,000 + yearly cash flow SEK 100,000 (SEK 200,000 – SEK 100,000) x sum of present value formula $((1-(1+0.08)^{-10})/0.08$ – disposal value SEK 200,000 x present value formula $1/(1+0.08)^{10} = \text{SEK } 78,369$. Since the net present value is positive, the company should invest in the machine
- b. The payback period is 5 years (initial outlay SEK 500,000/yearly cash flow SEK 100,000). They should not invest in the machine, since the payback time is longer than the demand, which is 3 years.
- c. The internal rate of return is 12 % (test with different interests until the present value is as close to zero as possible). The company should invest in the machine, since the internal rate of return is higher than the demand, which is 8 %.

6:7 AlternAB

- a. – Initial outlay SEK 1,050,000 + yearly cash flow SEK 220,000 x sum of present value formula $((1-(1+0.07)^{-7})/0.07$ + disposal value SEK 150,000 x present value formula $1/(1+0.07)^7 = \text{SEK } 229,056$
- b. Present value SEK 229,056 x annuity formula $0.07/(1-(1+0.07)^{-7}) = \text{SEK } 42,502$.
- c. – Initial outlay SEK 1,430,000 + yearly cash flow SEK 280,000 x sum of present value formula $((1-(1+0.07)^{-9})/0.07$ + disposal value SEK 220,000 x present value formula $1/(1+0.07)^9 = \text{SEK } 513,930$
- d. Present value SEK 513,930 x annuity formula $0.07/(1-(1+0.07)^{-9}) = \text{SEK } 78,881$.
- e. Lathe B should be chosen, because it has the highest annuity of the two. Net present value isn't relevant in this case, since the alternatives have differences when it comes to the economic life.

6:8 Xort

- a. – Initial outlay SEK 900,000 + yearly cash flow SEK 150,000 x sum of present value formula $((1-(1+0.06)^{-8})/0.06 + \text{disposal value SEK } 200,000 \times \text{present value formula } 1/((1+0.06)^8) = \text{SEK } 156,952$
- b. Present value SEK 156,952 x annuity formula $0.06/(1-(1+0.06)^{-8}) = \text{SEK } 25,275$.
- c. The internal rate of return is 10 %. With that, the net present value is close to 0 (SEK -6,460). Use trial-and-error for this.
- d. The payback period is 6 years (initial outlay SEK 900,000/yearly cash flow SEK 150,000).
- e. The investment is profitable according to the net present value (positive), the annuity (positive), the internal rate of return (over the demand for it) but not according to the payback time (longer time than demand). Most measures indicate that the company *should invest in it*; the payback time is not a good measure.

6:9 Kohurt

- a. The company invests SEK 840,000. After one year the investment has paid back SEK 320,000, after two years SEK 600,000 (SEK 320,000 + SEK 280,000), and after three years SEK 880,000 (SEK 600,000 + SEK 240,000 + SEK 40,000). So, the payback period is *below three years*, and the company should invest in a Kohurt.
- b. First that it (in its original form) doesn't take interest into account, second that it only takes the years that are within the payback time into account (i.e. not the following years).
- c. – Initial outlay SEK 840,000 + cash flow year 1 SEK 320,000 x present value formula $1/((1+0.10)^1)$ + cash flow year 2 SEK 280,000 x present value formula $1/((1+0.10)^2)$ + cash flow year 3 (SEK 240,000 + disposal value SEK 40,000) x present value formula $1/((1+0.10)^3) = \text{SEK } -107,318$
- d. Present value SEK -107,318 x annuity formula $0.10/(1-(1+0.10)^{-3}) = \text{SEK } -43,154$.
- e. *More than 2 %* (test with different interests until the net present value is as close to zero as possible)

6:10 A new machine

- a. – Initial outlay SEK 140,000 + yearly cash flow SEK 30,000 x sum of present value formula $((1-(1+0.08)^{-8})/0.08 + \text{disposal value SEK } 10,000 \times \text{present value formula } 1/((1+0.08)^8) = \text{SEK } 37,802$
- b. Present value SEK 37,802 x annuity formula $0.08/(1-(1+0.08)^{-8}) = \text{SEK } 6,578$.
- c. The payback period is 4,7 years (initial outlay SEK 140,000/yearly cash flow SEK 30,000).
- d. With net present value and annuity considered, the answer is yes; they should invest in the machine since those values are positive. If we consider the payback time, the answer is also yes; the payback time (4.7 years) is shorter than the demand (a maximum of 5 years).

6:11 Sablar AB

- a. – Initial outlay SEK 240,000 + yearly cash flow year 1 and 2 SEK 40,000 x sum of present value formula $((1-(1+0.15)^{-2})/0.15 + \text{cash flow year 3 SEK } 60,000 \times \text{present value formula } 1/((1+0.15)^3) + \text{cash flow year 4 SEK } 60,000 \times \text{present value formula } 1/((1+0.15)^4) + \text{cash flow}$

year 5 SEK 60,000 x present value formula $1/((1+0.15)^5)$ + cash flow year 6 SEK 60,000 x present value formula $1/((1+0.15)^6)$ + cash flow year 7 SEK 50,000 x present value formula $1/((1+0.15)^7)$ + cash flow year 8 (SEK 50,000 + disposal value SEK 40,000) x present value formula $1/((1+0.15)^8) = \text{SEK } 2,773$. Yes, since the net present value is positive.

- b. Present value SEK 2,773 x annuity formula $0.15/(1-(1+0.15)^{-8}) = \text{SEK } 618$. Yes, since the annuity is positive.
- c. The payback period is 4 to 5 years (initial outlay SEK -240,000; after one year, the sum of cash flow per year is SEK 40,000 (SEK 0 + this year's SEK 40,000), after two years SEK 80,000 (since earlier SEK 40,000 + this year's SEK 40,000), after three years SEK 140,000 (since earlier SEK 80,000 + this year's SEK 60,000), after four years SEK 200,000 (since earlier SEK 140,000 + this year's SEK 60,000), after five years SEK 260,000 (since earlier SEK 200,000 + this year's SEK 60,000). So, after five years, the sum of cash flow during the years (SEK 260,000) is higher than the initial outlay (SEK 240,000), and the payback period is reached. Therefore: No, since the payback period has been reached after between 4 and 5 years, while the demand for payback period is less than 4 years; it takes too long time to get the money back.
- d. Yes, since the investment is profitable with the 15 % interest that we used in our calculations, it is profitable with the required 14 %; the lower the interest, the higher the profitability.

6:12 InvesterAB

First: Note that depreciation is not a cash flow, and should therefore not be included in the calculations

- a. – Initial outlay SEK 2,000,000 + yearly cash flow SEK 550,000 x sum of present value formula $((1-(1+0.10)^{-8})/0.10 + \text{disposal value SEK } 50,000 \times \text{present value formula } 1/((1+0.10)^8) = \text{SEK } 957,535$
- b. Present value SEK 957,535 x annuity formula $0.10/(1-(1+0.10)^{-8}) = \text{SEK } 179,484$.
- c. – Initial outlay SEK 1,300,000 + yearly cash flow SEK 550,000 x sum of present value formula $((1-(1+0.10)^{-5})/0.10 = \text{SEK } 784,933$
- d. Present value SEK 784,933 x annuity formula $0.10/(1-(1+0.10)^{-5}) = \text{SEK } 207,063$.
- e. NPV suggests A, annuity suggests B. Since the machines have different economic lives, and since this is a replacement investment, meaning that this is an operation that is not for one single period, annuity gives us the correct choice. Therefore, B is the most profitable alternative; it gives a positive annuity of SEK 207,063 compared to only SEK 179,484 for alternative A.

6:13 KingKong

The yearly net cash inflows are SEK 43,000 (SEK 70,000 - SEK 27,000).

- a. – Initial outlay SEK 180,000 + yearly cash flow SEK 43,000 x sum of present value formula $((1-(1+0.08)^{-8})/0.08 - \text{extra cash flow year 4 SEK } 40,000 \times \text{present value formula } 1/((1+0.08)^4) - \text{disposal value SEK } 20,000 \times \text{present value formula } 1/((1+0.08)^8) = \text{SEK } 26,899$
- b. Yes, it is profitable since the present value of the investment is positive.
- c. Present value SEK 26,899 x annuity formula $0.08/(1-(1+0.08)^{-8}) = \text{SEK } 4,681$.
- d. Yes, it's profitable since the annuity of the investment is positive.

- f. The payback period is *slightly more than 5 years*. The company invests SEK 180,000. After one year the investment has paid back SEK 43,000, after two years SEK 86,000 (SEK 43,000 + SEK 43,000), after three years SEK 129,000 (SEK 86,000 + SEK 43,000), after four years SEK 132,000 (SEK 129,000 + SEK 43,000 – SEK 40,000), after five years SEK 175,000 (SEK 132,000 + SEK 43,000), and after six years SEK 218,000 (SEK 175,000 + SEK 43,000). So, it takes a little bit more than five years to get the money back.
- g. *It's higher than 8 %*. The internal rate of return is the interest that gives the present value 0, and since the present value is positive at 8 % interest, the internal rate of return has to be higher than this (12.02 % if calculated).

6:14 AnimaSpel AB

Note that depreciation is not a cash flow, and should therefore not be included in the calculations. So, the depreciation of (SEK 4,000,000/5 years=) SEK 800,000 the first five years for the new truck and of (SEK 2,000,000/5 years=) SEK 400,000 for the used truck during the five years is deducted from the yearly cost, and the result is the yearly cash out.

- a. Examples of positive posts include the sell value of the used truck, the sell value if sold as spare parts, and the disposal value; examples of negative posts include the scrapping cost, the cost to transport it away, and the cost to sell it
- b. How long it is economically viable to have the investment
- c. – Initial outlay SEK 4,000,000 - yearly cash flow SEK 1,000,000 x sum of present value formula $((1-(1+0.12)^{-8})/0.12 + \text{disposal value SEK } 500,000 \times \text{present value formula } 1/((1+0.12)^8)) = -\text{SEK } 8,765,698$
- d. Present value $-\text{SEK } 8,765,698 \times \text{annuity formula } 0.12/(1-(1+0.12)^{-8}) = -\text{SEK } 1,764,560$.
- e. – Initial outlay SEK 2,000,000 - yearly cash flow SEK 1,500,000 x sum of present value formula $((1-(1+0.12)^{-5})/0.12 + \text{disposal value SEK } 200,000 \times \text{present value formula } 1/((1+0.12)^5)) = -\text{SEK } 7,293,679$
- f. Present value $-\text{SEK } 7,293,679 \times \text{annuity formula } 0.12/(1-(1+0.12)^{-5}) = -\text{SEK } 2,023,278$.
- g. NPV suggests the used truck (since it has a lower negative NPV), annuity suggests the new truck (since it has a lower negative annuity). Since the trucks have different economic lives, and since they will be replaced under foreseeable time, annuity gives us the correct choice. Therefore, the new truck is the most profitable alternative.

6:15 Shazam Ltd

The yearly net cash inflow is (2,000 units x (SEK 850 - SEK 100) - SEK 600,000) = SEK 900,000 for each alternative.

- a. – Initial outlay SEK 4,400,000 + yearly cash flow SEK 900,000 x sum of present value formula $((1-(1+0.10)^{-8})/0.10 + \text{disposal value SEK } 600,000 \times \text{present value formula } 1/((1+0.10)^8)) = \text{SEK } 681,338$
- b. Present value $-\text{SEK } 681,338 \times \text{annuity formula } 0.10/(1-(1+0.10)^{-8}) = \text{SEK } 127,713$.
- c. – Initial outlay SEK 3,500,000 + yearly cash flow SEK 900,000 x sum of present value formula $((1-(1+0.10)^{-5})/0.10 + \text{disposal value SEK } 1,000,000 \times \text{present value formula } 1/((1+0.10)^5)) = \text{SEK } 532,629$
- d. Present value $-\text{SEK } 532,629 \times \text{annuity formula } 0.10/(1-(1+0.10)^{-5}) = \text{SEK } 140,506$.

- e. Shazam Ltd should choose robot B, since it has the higher annuity compared to robot B. The annuity is the correct value to choose from in this case, since it's a repeated investment and since the alternatives have different economic life lengths.
- f. The content of the net cash flow (yearly cash in and cash out) aren't needed in the calculations for the decision, since they are the same for the two alternatives.
- g. The problems with the payback period is first that interest isn't part of the calculations (in the simple version of it), and second that the calculations only take the first years (the years until the payback period has been fulfilled) into account and therefore doesn't take the following years into account.
- h. One example on what could be a part of the positive disposal value is compensation for scrapping, another is what the used robot can be sold for.

6:16 Saragano Ltd

The calculations can be found below. The yearly net cash inflow is (SEK 8,000,000 – SEK 2,500,000) SEK 5,500,000 for each alternative.

- a. – Initial outlay SEK 16,000,000 + yearly cash flow SEK 5,500,000 x sum of present value formula $((1-(1+0.20)^{-8})/0.20$ - disposal value SEK 7,000,000 x present value formula $1/((1+0.20)^8)$ = SEK 3,476,403
- b. Present value SEK 3,476,403 x annuity formula $0.20/(1-(1+0.20)^{-8})$ = SEK 905,983.
- c. Initial outlay SEK 16,000,000/yearly cash flow SEK 5,500,000 = 2.9 years.
- d. – Initial outlay SEK 11,000,000 + yearly cash flow SEK 5,500,000 x sum of present value formula $((1-(1+0.20)^{-5})/0.20$ - disposal value SEK 5,000,000 x present value formula $1/((1+0.20)^5)$ = SEK 3,438,979
- e. Present value SEK 3,438,979 x annuity formula $0.20/(1-(1+0.20)^{-5})$ = SEK 1,149,925.
- f. Initial outlay SEK 11,000,000/yearly cash flow SEK 5,500,000 = 2 years.
- g. Payback period is never valid. Present value is, in this setting, only valid if the economic life is the same for two alternatives. So, *annuity* is the correct method in this case. According to that, *machine B* should be chosen since it has a higher positive annuity (SEK 1,149,925) than machine A (SEK 905,983).
- h. The internal rate of return is the interest where the present value is 0. So, it tells us what *interest* the investment has; the higher the internal rate of return, the better.

6:17 PansAB (20 exam points)

Please note that the sum of cash in and cash out is SEK 34,000 each of the six years.

- a. – Initial outlay SEK 118,918 + yearly cash flow SEK 34,000 x sum of present value formula $((1-(1+0.12)^{-6})/0.12$ = SEK 20,870
- b. Yes, it is profitable since the present value of the investment is positive
- c. Present value SEK 20,870 x annuity formula $0.12/(1-(1+0.12)^{-6})$ = SEK 5,076.
- d. Yes, it's profitable since the annuity of the investment is positive
- e. Yes, it's profitable according to the internal rate of return since it with 18 % interest gives the present value 0, and therefore the present value must be positive at 15 % which is the demand

- f. Initial outlay SEK 118,918/yearly cash flow SEK 34,000 = 3.5 years.
- g. Depreciation shouldn't be part of the calculations since they are *not cash out*; only cash in and cash out should be part of it. Depreciation is a cost, the cash out for this appears year 0 as an initial outlay
- h. The SEK 1,000 paid one year before this shouldn't be part of the calculation, since it's a *sunk cost*; an historical cost that shouldn't affect the decision. Only future events are interesting

6:18 Investos

- a. – Initial outlay SEK 12,000,000 + yearly cash flow SEK 4,000,000 x sum of present value formula $((1-(1+0.14)^{-8})/0.14 - \text{disposal value SEK } 5,000,000 \times \text{present value formula } 1/((1+0.14)^8) = \text{SEK } 4,802,660$
- b. As the sum today of all future values of an investment
- c. Present value SEK 4,802,660 x annuity formula $0.14/(1-(1+0.14)^{-8}) = \text{SEK } 1,035,310$.
- d. As a cash flow that is the same over the years
- e. – Initial outlay SEK 8,000,000 + yearly cash flow SEK 4,000,000 x sum of present value formula $((1-(1+0.14)^{-4})/0.14 = \text{SEK } 3,654,849$
- f. Present value SEK 3,654,849 x annuity formula $0.14/(1-(1+0.14)^{-4}) = \text{SEK } 1,254,362$.
- g. The *annuity* is the only relevant measure here, since the number of years are different and since it is a production that will keep on in the foreseeable future. Therefore, alternative B is best; it has the highest annuity
- h. It doesn't take interest into account, and it does only take the first years into account – until the pay-back-time is reached

7. Following up the Business, Solutions

7:1 Continuous questions

- a. Make sure that the answer includes a good definition of the measure, e g Result after financial income divided with average total capital (average of e g two years), Result after financial expenses since the financial cost is part of the profit for the total capital (the part that goes to external lenders), and average total capital since the profit is earned not a specific day but during the year. Make sure that the answer includes a discussion about the measure in general, that it indicates the profitability of the business for all that have placed money in it, and that there is also a discussion, it might be short, about the measure for the specific company.
- b. The student must define the concepts, for example: ROE is profit after financial income and costs divided by average equity. It shows the return that the shareholders receive on their capital. ROI is profit after financial income divided by average total capital. It shows the return on total capital, ie on owners and lenders' capital. It's important that you can see or sense that the student has really calculated this and not just taken it from the annual report. The answer on the latter part, what the measures stand for, can vary: The important thing is that the student is trying to understand the measures
- c. The measures should be defined, they are the current ratio which is current assets divided with the current liabilities; and the acid test ratio which is current assets less inventory divided with the current liabilities. The latter is more valid when the inventory can be sold quickly for a reasonable price. The measures are for the ability to pay; can the company pay its liabilities with the money they have or soon will have? The acid test ratio should be 1 or more if the terms for payment is the same for current assets and current liabilities. A discussion about the value of the measures for the company focused on this is needed. Also make sure that the student has really calculated these measures and not just found them somewhere.
- d. It is important that the student have calculated this herself/himself. The three parts are the return on total capital, calculated as profit after financial income (or profit after financial items plus financial expenses) divided by the (possibly average) total capital, and consists of two components: first, profit after financial income divided by sales, known as profit margin, and then sales divided by total capital, which is the asset turnover. If the two are multiplied with each other, the return on capital is obtained. A company can achieve a high return on capital by, as Rolex and Audi, high profit margins, or by, as IKEA and HM, a high asset turnover. A discussion in that direction is required for the student's own company.
- e. Equity ratio is equity divided by total assets and shows the long-term viability of the company (the proportion of the capital that is risk willing), and the debt/equity ratio is debt divided by equity, and can be seen as a reversed equity ratio - a high equity ratio provides a low debt/equity ratio and vice versa. (The student can also refine the two measures by calculating them with deferred taxes and average capital, but this is not necessary.) The discussion can be about what the measures show, what's good values (a higher equity ratio than the competitors provide higher viability, all else equal, but then also lower the debt/equity ratio which reduces the leverage effect for equity). The important thing here is that the student shows that s/he understands the measures.

7:2 Short questions

- a. About the *liability* of the board, about if the *income statement and the balance sheet (statement of financial position)* are OK, and about if the suggested *dividend* is OK
- b. As profit after financial income divided with sales
- c. As (current assets – inventory) divided with current liabilities
- d. Non-current assets are planned to be used during a longer time period than one year, current assets within one year
- e. This means that it should be valued at the lowest of the historical cost, the replacement cost, and the selling price
- f. For the owner (often the shareholder)
- g. As equity divided with total capital
- h. Matching, going concern, consistency, prudence, realization, true and fair view
- i. General journal (in order of time) and general ledger (account by account).
- j. That accounting should be performed as if the company is going to last “forever” (e.g. no realization values should be used)
- k. Debit means the left side of an account; credit means the right side of an account
- l. The shareholders (in the AGM, the Annual General Meeting)
- m. Result after financial income (or; result after financial income and cost plus financial cost)]
- n. As current assets divided with current liabilities
- o. One year

7:3 Kept books

- a. Bank account Debit, Share capital (or Equity) Credit
- b. Cash Debit, Bank account Credit
- c. Inventory Debit, Bank account Credit
- d. Cost of Salary Debit, Bank account Credit
- e. Cost of Energy Debit, Cash Credit
- f. Inventory Debit, Accounts payable Credit
- g. Bank account Debit, Revenues Credit
- h. Accounts receivable Debit, Revenues Credit
- i. Accounts payable Debit, Cash Credit
- j. Cash Debit, Accounts receivable Credit

7:4 The DuPont-formula

The DuPont-formula shows that return on total capital (profit before tax plus financial expenses divided with average total capital) equals profit margin (profit before tax plus financial expenses divided with sales) times asset turnover (sales divided with average total capital).

It is important for the company to have a satisfying return on total capital, so that it can appropriately compensate its owners and lenders. This can be achieved either by earning a lot per dollar of sales (high profit margin), or by having a “high speed” in the business (high asset turnover), or a combination of the two. This is the relationship that the DuPont-formula shows, also decomposed in its ingoing components.

7:5 Balansakten AB

- Quick ratio = current assets excluding inventories/current liabilities = (SEK 1,200,000 – SEK 400,000)/SEK 1,300,000 = 0.62
- Current ratio = current assets/current liabilities = SEK 1,200,000/SEK 1,300,000 = 0.92
- Equity ratio = equity/total capital = SEK 500,000/SEK 3,000,000 = 17 %
- You must know the terms of payment for current assets and for current liabilities. If the current assets have longer payment terms than the current liabilities, the cash flows in slower than they flow out, and therefore a higher ratio is needed (and vice versa).
- You must know the equity ratio of the competitors (and their relative conditions), since it is the relative equity ratio that decides what companies that will be outperformed and what that will not

7:6 The competitors

The following can be calculated:

| | DEFAB | FEBAB | Calculation |
|-------------------|-------|-------|--|
| Profit margin | 20 % | 10 % | (Profit before tax + financial expenses)/Sales |
| Asset turnover | 2,5 | 5 | Sales/Total capital |
| Return on capital | 50 % | 50 % | (Profit before tax + financial expenses)/Total capital |

The calculations show that the two companies have the same return on capital (50 %), but reach this by different means: DEFAB by a high profit margin (they earn a lot per dollar sold), FEBAB by a high asset turnover (they have a high pace in their operations).

7:7 Nycklab

- Quick ratio = (current assets – inventory)/current liabilities = (SEK 1,400 – SEK 700)/SEK 800 = 0,875
- Current ratio = current assets/current liabilities = SEK 1,400/SEK 800 = 1,75
- Equity ratio = equity/total capital = SEK 900/SEK 3,600 = 25 %
- Quick ratio and current ratio tests the *ability to pay* in the short run; does the company manage to pay its bills in due time? Most often, quick ratio is a better measure of this. The equity ratio tests the *ability to survive* in the long run; does the company manage the competitive situation?

7:8 Skakis AB

- a. Current ratio = Current assets divided with current liabilities. $(\text{SEK } 100 + \text{SEK } 50 + \text{SEK } 75)/\text{SEK } 150 = 1.5$ [or 150]. Can the company pay their liabilities in the short term?
- b. Quick ratio = Current assets (less inventories) divided with current liabilities. $(\text{SEK } 50 + \text{SEK } 75)/\text{SEK } 150 = 0.83$ [or 83]. Can the company pay their liabilities in the short term? Often a better measure of this than a above, since inventory is often difficult to sell in the short run in a crisis.
- c. Equity ratio = Equity divided with total capital. $(\text{SEK } 300 + \text{SEK } 15)/\text{SEK } 525 = 0.6$ [or 60 %]. The ability to survive, in the long run, due to a higher percentage of equity = more risk willing capital
- d. We can't say much about the financial health from the figures above; we need to know more about the history and about the competitors. The only reliable rule of thumb we have here is for c, which should be 1 or above if the company has the same agreements for customers as for suppliers. So, if that is the case, the measure is a little bit too low.

7:9 Cash flow analysis

Net cash from operating activities (the profit or loss of the year corrected for what doesn't affect the cash flow, and changes in the working capital), net cash from investing activities (investment and disinvestment in machines, facilities, land and such), and net cash from financing activities (borrowing and amortization, rights issuing, dividends paid and such).

7:10 Eureka AB

- a. It is a decrease of 100, and this is positive to the cash flow from operating activities.
- b. It is a decrease of 100, and this is negative to the cash flow from operating activities
- c. No effect at all, since it is a part of the investment activities, not of the operating activities
- d. Net investments in assets can be calculated as: Ending balance 300 + Depreciation 60 = 360 – Ingoing balance 400 = -40. So; a net disinvestment, -40, and this is positive for the cash flow from investing activities
- e. No change in loans (250-250), Dividends paid -10. So; a net effect of -10 on cash flow from financing activities

7:11 Fearless

- a. Quick ratio = $(\text{SEK } 820 + \text{SEK } 80)/\text{SEK } 880 = 1,02$
- b. Current ratio = $(\text{SEK } 2,700 + \text{SEK } 820 + \text{SEK } 80)/\text{SEK } 880 = 4,09$
- c. Return on capital = $(\text{SEK } 3,100 + \text{SEK } 500)/((\text{SEK } 10,950 + \text{SEK } 8,100)/2) = 38 \%$
- d. Return on equity = $\text{SEK } 2,600/((\text{SEK } 4,000 + \text{SEK } 2,400 + \text{SEK } 2,600 + \text{SEK } 4,000 + \text{SEK } 2,400)/2) = 34 \%$
- e. Profit margin = $(\text{SEK } 3,100 + \text{SEK } 500)/\text{SEK } 25,100 = 14 \%$
- f. Asset turnover = $\text{SEK } 25,100/((\text{SEK } 10,950 + \text{SEK } 8,100)/2) = 2,6 \text{ times}$
- g. The cash flow analysis:

| | | | |
|---|----------------------|-------|---------------|
| Profit of the year before depreciation | 2,600+200 | 2,800 | |
| Increase in inventories | 2,700-2,650 | -50 | |
| Decrease in accounts receivables | 820-860 | +40 | |
| Decrease in accounts payables | 880-900 | -20 | |
| = Cash-flow from operating activities | | | +2,770 |
| Net investments in non-current assets | 7,350+Depr 200-4,500 | 3,050 | |
| = Cash-flow from investing activities | | | -3,050 |
| Increase in loans | 1,120-800 | +320 | |
| Dividends paid | | -50 | |
| = Cash-flow from financing activities | | | +270 |
| | | | |
| Opening cash and cash equivalents | | | 90 |
| Changes in cash and cash equivalents as above | 2,770-3,050+270 | | -10 |
| Closing cash and cash equivalents | | | =80 |

7:12 Håkan's Bookkeeping

- The company has paid for electricity used by its bank account. The profit decrease by this transaction. Electricity is a cost account. The account (the cost) increase.
- The company has paid an invoice through its bank account. The profit isn't affected by this transaction. Accounts payable is a liability account. The account (the liability) decrease.
- The company has sold products on credit. The profit increase by this transaction. Sales is a revenue account. The account (the revenue) increase.
- The company moves money from the bank account to the cash box. The profit isn't affected by this transaction. Cash box is an assets account. The account (assets) increase.
- The company amortizes (pays back) on a loan through its bank account. The profit isn't affected by this transaction. Loan is a liability account. The account (liabilities) decrease.

7:13 Lisa keeps the books

The transactions should be booked as follows:

| Inventory A | |
|-----------------------|----------|
| c 40 000 | 67 000 o |
| d 2 000 | |
| e 30 000 | 5 000 |
| <hr/> | |
| Accounts receivable A | |
| j 80 000 | 80 000 k |

Share capital L

| Salaries C | |
|------------|--------|
| g 50 000 | 50 000 |

| Balance sheet | | |
|---------------|----------------|-----------------------------|
| Inventory | 5 000 | 500 000 Share capital |
| Bank | 471 000 | |
| Cash | 38 000 | <i>14 000 Profit</i> |
| | 514 000 | 514 000 |

| Bank A | |
|--------|----------------|
| a | 500 000 |
| i | 20 000 |
| k | 80 000 |
| | 5 000 b |
| | 40 000 c |
| | 30 000 f |
| | 50 000 g |
| | 1 000 l |
| | 3 000 n |
| | 471 000 |

| | |
|--------------------|----------|
| Accounts payable L | |
| f 30 000 | 30 000 e |
| n 3 000 | 3 000 m |

| | |
|---------|---------------|
| | Electricity C |
| I 1 000 | 4 000 |
| m 3 000 | |

Material C
o 67 000 | **67 000**

| Sales R | |
|----------------|----------|
| | 35 000 h |
| | 20 000 i |
| 135 000 | 80 000 j |

| Income statement | | |
|------------------|----------------|----------------|
| Salaries | 50 000 | 135 000 Sales |
| Electricity | 4 000 | |
| Material | 67 000 | |
| Profit | 14 000 | |
| | | |
| | 135 000 | 135 000 |

| Cash A | |
|----------|---------------|
| b 5 000 | 2 000 d |
| h 35 000 | 38 000 |

q. The result is a **profit of SEK 14,000**

8. Analyzing Change, Solutions

8:1 Continuous questions

- a. It's important that the student provides a definition, for example, that half-fixed costs are costs that are fixed within an interval, when a certain volume is reached more of the resource is needed and the cost rises stepwise because of this. Examples and reasons for these can be, for example, staff at a certain machine, where it is enough with one employee until the volume reaches a certain level, and therefore they need to hire one more; at a later volume need to hire even one more; etc. Or they can get by with only one lathe to a certain volume when another lathe is needed, and so on. In a university, it is enough to have one single group of students until they are, say, over 40 students, and then they have more groups etc. For programming, it is enough to have just one programmer until the number of projects is too large, then one more programmer is needed. Etc.
- b. First, the student should define the concept of variable costs and/or argue for why the cost chosen are variable. The relevant area, which should be defined, is the area where the fixed costs are completely fixed and the variable costs are proportionally variable. What happens: E g, for materials you might wind up on a higher scale of discounts, which means that the slope is lower, that it becomes a declining variable cost. For piecework the cost perhaps is higher per unit at higher volumes, and lower at very low volumes. Etc.

8:2 Short questions

- a. A cost that is fixed within a certain volume interval
- b. A cost that increase as the volume increase, but at a lower and lower pace. E g material when you get a higher rebate the more you buy.
- c. Decreasing variable cost.
- d. The difference between actual volume and the break-even volume (or the difference between the actual sales and the break-even sales)
- e. The area in which the fixed costs are completely fixed, and the variable costs proportionally variable

8:3 Cost, cash out, and expensed cost

- a. *Expensed cost*, since it has been used up during the year, but the cash out and the commitment (cost) has been made earlier
- b. *Cost*, since it is a commitment, but no expensed cost because it hasn't been used yet and there hasn't been a cash out yet
- c. *Cost*, since it is a commitment, and *cash out*, since it has been paid. But no expensed cost, since the machine hasn't been used up yet.
- d. *Cash out*, since it has been paid. But no expensed cost, it is the interest that is the expensed cost here, and no cost, since the commitment has been made earlier, when the loan was granted.
- e. *Cash out*, since it has been paid. But no expensed cost, since it hasn't been used up yet, and no cost, since this occurred earlier.

8:4 Cost, cash out, expensed cost

- a. Material is bought in cash: Cost and cash out
- b. Material is bought on credit: Cost
- c. The material in b above is paid: Cash out
- d. The company pays this year's rent for the premises in cash: Cost, cash out, and expensed cost
- e. A machine is bought in cash: Cost and cash out
- f. A machine is depreciated for a specific year: Expensed cost
- g. The company is amortizing on a loan: Cash out

8:5 Costs

- a. A cost that has been placed in the correct period, matched with revenues
- b. A cost that increase when the volume increase, and decrease when the volume decrease
- c. A cost that is affected by a decision
- d. Missed net revenues due to deciding (and not the alternatives)
- e. A cost that can be placed directly on a cost object

8:6 SvårAB

- a. A variable cost is a cost that (in total) increase with an increase in volume and decrease with a decrease in volume.
- b. *SEK 2 each.* The difference in cost ($SEK\ 57,000 - SEK\ 55,000 = SEK\ 2,000$) is because of the difference in volume ($16,000\ \text{units} - 15,000\ \text{units} = 1,000\ \text{units}$). This means, that the variable cost, that is what changes, is ($SEK\ 2,000 / 1,000\ \text{units}$) SEK 2.
- c. A fixed cost is a cost that isn't affected by volume
- d. *SEK 25,000.* If e.g. analyzing the month with SEK 55,000 in costs, SEK 30,000 ($15,000\ \text{units} \times SEK\ 2\ \text{per unit}$) variable cost, and the rest ($SEK\ 55,000 - SEK\ 30,000$), i.e. SEK 25,000 fixed cost.

8:7 Slagverken

- a. Variable cost per unit = $(SEK\ 406,000 - SEK\ 340,000) / (7,400 - 5,200) = SEK\ 30\ \text{per unit}$
- b. Fixed costs = $SEK\ 340,000 - (5,200 \times SEK\ 30) = SEK\ 184,000$
- c. These calculations are based upon the prerequisites that all variable costs are proportionally variable, that all fixed costs are completely fixed, and that no changes except changes in volume (e.g. new machines bought) have affected the costs between the two months.

8:8 Rörfast AB

- a. Variable cost per unit = $(SEK\ 450,000 - SEK\ 441,000) / (48,000 - 46,200) = SEK\ 5\ \text{per unit}$
- b. Fixed cost = $SEK\ 450,000 - (48,000 \times SEK\ 5) = SEK\ 210,000$
- c. Decreasing and increasing

- d. It increases in intervals. First, maybe we have a machine for SEK 20,000 per year, and then when we buy one more of the same the cost will increase to SEK 40,000 per year.

8:9 Fasta Rör AB

- a. The cost increase with (SEK 1,930,000 – SEK 1,630,000 =) SEK 300,000 when the volume increase with (102,000 units – 82,000 units =) 20,000 units. This means that the variable cost is (SEK 300,000/20,000 units =) *SEK 15 per unit*
- b. Total cost = Fixed cost + (Variable cost per unit x volume). E.g. when 82,000 units: SEK 1,630,000 = Fixed cost + (SEK 15 x 82,000 units); SEK 1,630,000 – SEK 1,230,000 = *SEK 400,000*
- c. The break-even point can be found where the revenues and the costs have the same amount, that is, when price x volume = variable cost x volume + fixed cost. SEK 20 x V = SEK 15 x V + SEK 400,000. SEK 5 x V = SEK 400,000. V = SEK 400,000 / SEK 5 = *80,000 units*
- d. The margin of safety in units = 102,000 units – 80,000 units = *22,000 units*. The margin of safety in percent = 22,000 units/102,000 units = *22 %*

8:10 Samsong AB

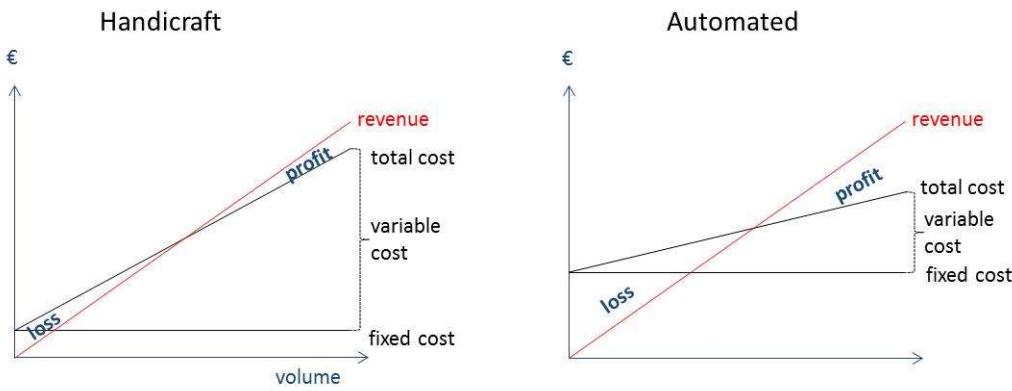
- a. *SEK 5 per unit* (SEK 170,000 – SEK 160,000)/(10,000 units – 8,000 units)
- b. *SEK 120,000* (SEK 170,000 – (10,000 units x SEK 5))
- c. That all variable costs are proportionally variable, that all fixed costs are completely fixed, and that no changes except in volume (e.g. salary increases) have affected the costs between the two months.
- d. *SEK 190,000* ((14,000 units x SEK 5 per unit) + SEK 120,000).

8:11 Säkerheten AB

- a. Break-even point = fixed costs/(price-variable cost) = SEK 2,400,000/(SEK 30 – SEK 22) = *300,000 units*
- b. Margin of safety = real volume – break-even volume = 540,000 – 300,000 = *240,000 units*
- c. Margin of safety in percent = Margin of safety/real volume = 240,000/540,000 = *44,4%*

8:12 Industrialized organizations

When a company is automatized, the fixed costs will increase, and the slope of the variable cost will (relatively) decrease (and therefore also the slope of the curve for the total costs will decrease). Therefore, the profit (loss) is higher in an automatized company. This can be illustrated by the following:



8:13 Selia [20 points]

- Variable cost per unit = the difference in cost divided with the difference in volume = $(\text{SEK } 1,137,500 - \text{SEK } 1,062,500)/(4,750 \text{ units} - 4,250 \text{ units}) = \text{SEK } 75,000/500 \text{ units} = \text{SEK } 150 \text{ per unit}$.
- Fixed cost = the total cost minus the variable cost = (calculated for January) $\text{SEK } 1,137,500 - (4,750 \text{ units} \times \text{SEK } 150) = \text{SEK } 425,000$ [if calculated for February, you'll get the same fixed cost as $\text{SEK } 1,062,500 - (4,250 \text{ units} \times \text{SEK } 150)$].
- First, we calculate the price. The price is the revenues divided with the volume = (calculated for January) $\text{SEK } 1,520,000/4,750 \text{ units} = \text{SEK } 320$ (if calculated for February, you'll get the same price as $\text{SEK } 1,360,000/4,250 \text{ units}$). The break-even volume is where price \times volume = variable cost \times volume + fixed cost $\Rightarrow \text{SEK } 320 \times V = \text{SEK } 150 \times V + \text{SEK } 425,000 = \text{SEK } 425,000/(\text{SEK } 320 - \text{SEK } 150) = \text{SEK } 170 = 2,500 \text{ units}$.
- The margin of safety in volume in January = the actual volume minus the break-even volume = $4,750 \text{ units} - 2,500 \text{ units} = 2,250 \text{ units}$, and in % (the margin of safety divided with the actual volume) = $2,250 \text{ units}/4,750 \text{ units} = >47 \%$.
- It can be e.g. salaries to full-time employees. When the volume increases, the cost doesn't increase until a certain level of volume, and then more employees are needed. Then, the cost stays at that level until more employees are needed and so on; we get a stepwise increase. When the volume decreases, the cost doesn't follow at the same speed due to e.g. laws about how to fire people. So, the cost is a little bit higher than it should be in times of decreasing volume.

8:14 Varfix Ltd

- Variable cost per unit = $(\text{SEK } 1,013,000 - \text{SEK } 965,000)/(2,200 \text{ units} - 2,000 \text{ units}) = \text{SEK } 48,000/200 \text{ units} = \text{SEK } 240 \text{ per unit}$
- Fixed cost = $\text{SEK } 1,013,000 - (2,200 \text{ units} \times \text{SEK } 240) = \text{SEK } 1,013,000 - \text{SEK } 528,000 = \text{SEK } 485,000$
- First, we find the price. The price is $\text{SEK } 1,100,000/2,200 \text{ units} = \text{SEK } 500$. Break-even volume is where price \times volume = variable cost \times volume + fixed cost = $\text{SEK } 500 \times V = \text{SEK } 240 \times V + \text{SEK } 485,000 = \text{SEK } 485,000/(\text{SEK } 500 - \text{SEK } 240) = \text{SEK } 260 = (\text{a little more than}) 1,865 \text{ units}$
- Margin of safety in volume in August = $2,000 \text{ units} - 1,865 \text{ units} = 135 \text{ units}$, and in % = $135 \text{ units}/2,000 \text{ units} = 6,75 \%$
- Decreasing (e.g. material with bonus, when you pay lower prices per unit the more you buy)

and increasing (e.g. piecework, if payed higher per unit the more the workers produce)

- f. E.g. machines. Up to a certain volume, you only need one machine, but then you must buy one more machine, so the cost goes up. And so on

9. Financing the Business, Solutions

9:1 Continuous questions

- a. Make sure that the answer includes a definition of what safety capital is, e g that it's a part of the need for capital that should cover for variations as e g seasonal variations, unexpected events, and similar. And that there is a discussion around this for the company that has been chosen.
- b. The net asset value per share departs from a market assessment of the assets, and therefore includes extra values in equity. The value gives a good indication of what a share in the company might be worth, it's important that the student has a definition of that kind, and also examples on what could be included when valuing the students company: What can these extra values consist of? Extra values in real estate, machines and similar are good examples, but also (even if it isn't always included in the Net Asset Value) customer loyalty, goodwill and similar.
- c. Working capital is current assets minus current liabilities, that is, the portion of current assets that is financed by equity. It is important that the student has taken these two values from the annual report and calculated accordingly. Then, the student also should discuss this. S/he is supposed to connect to the theory in some way and show that s/he understands this, e g by discussing why it is so (it is natural that the short-term assets are financed by short-term liabilities), how the owners contribute with this capital (through retained profits, supplements or similar), the size of the working capital (the student e g might compare to last year), a s o - what is important is that there is a reflection on this
- d. The student should calculate these as non-current assets less non-current liabilities and as current assets minus current liabilities, respectively. And then discuss this: What's important is that s/he reflects upon what is calculated and what it means, more than the exact content of the discussion. It can be about the difference between the two, the parts that it contains, or some other interesting aspect.
- e. In the percentage method, working capital is assumed to follow the change in sales, so if sales increase with 10 %, the need for working capital will increase with 10 %. But the company also can find that it is a little bit different, e g that if sales increase, more is sold in cash or that the suppliers will be more generous when it comes to payment terms if more is bought and so on, which perhaps leads to that e g accounts receivable increase a little bit slower or that accounts payable increase a little bit faster. The student should reflect upon this, and upon the components of the working capital, so that s/he shows an understanding of this. An absolute calculation isn't needed, but can give a lot in itself.
- f. Make sure that the student discusses her/his company's capital usage in terms of tangible assets (facilities, land, machines, inventories a s o), financial assets (cash, cash equivalents, shares a s o), intangible assets (patent, goodwill, rights a s o), and/or intellectual capital (training, activities for the creation of a specific culture, recruitment activities a s o); and also understands what that type of capital usage means. It's enough with one of these, but in that case, it should be trustworthy that this is the only main type of capital usage for that company.

9:2 Short questions

- a. As non-current assets, less non-current liabilities
- b. Current assets and current liabilities

- c. Working capital
- d. Through a new share issue or through retained profits.
- e. As Dividend per share divided with the market value per share.
- f. Safety capital
- g. E.g. extra values in real estate, machines or similar; or customer loyalty, goodwill and similar
- h. Financial assets
- i. The market value of a share (e.g. the price on the stock exchange)

9:3 Measures for shares

- a. Net asset value/number of shares. The “real value” of each share, should the company stop its operations now
- b. Equity/number of shares. The value of each share, should all assets and liabilities have the “real value” (which they don’t have, since they have the accounting values)
- c. Market value per share/earnings per share. If e.g. the value is 3, it takes 3 years before the sum of earnings is equivalent to the market value of the share; a type of pay-back analysis
- d. Result of the year/number of shares. This is what the shareholder so to say gets from a specific year’s operations; a part of it as dividend, another part as increased equity
- e. Dividend per share/market value per share. This is how much, in percentage, the shareholder gets directly from an investment in the shares (it doesn’t cover the part that is kept in the company and that will increase the market value of the share).

9:4 Semlan AB

- a. Earnings per share = Result of the year/Number of shares = $1,400,000/20,000 = \text{SEK } 70 \text{ per share}$. Implies the owner’s part (per share) of the business of the year (direct or indirect).
- b. Equity per share = Equity/Number of shares = $1,000,000/20,000 = \text{SEK } 50 \text{ per share}$. Doesn’t indicate that much but shows the accounted value of equity per share.
- c. P/E = Market value per share/Earnings per share = $220/70 = 3.14$. Shows how many years of profit of the same size that are needed to get the cost of the share paid back, in this case 3.14 years.
- d. Net Asset Value per share = Net asset value (Equity + Additional value)/Number of shares = $(1,000,000 + 500,000)/20,000 = \text{SEK } 75 \text{ per share}$. Indicates what the owners would get, should the company be liquidated.
- e. Dividend yield = Dividend per share/Market value per share = $40/220 = 18\%$. Indicate how large part of the price of the share that the owners receive directly, in the form of dividends (in a longer perspective they also earn from growth in market value). Can be seen as the short-sighted part of the profit for the owners.

9:5 SnärtAB

- a. Increase, since the product needs e.g. more machines (*fixed capital*), more inventories (*working capital*) and so on
- b. Decrease, since the average inventory will decrease and therefore bind less *working capital*

- c. *Increase*, since the need for *fixed capital* in the form of an investment in a machine increase
- d. *Decrease*, since the suppliers then will finance more of the *working capital*
- e. *Decrease*, since we do not have to tie *working capital* for customers

9:6 DASAB

- a. Increase
- b. Decrease
- c. Increase
- d. Decrease
- e. Decrease
- f. Decrease
- g. Increase
- h. Increase
- i. Increase
- j. Decrease

9:7 Meroven Ltd

- a. The increase of SEK 120,000 in accounts receivables means that a) working capital increase (the difference between current assets (which increase) – current liabilities (unchanged) increase) and b) cash and cash equivalents decrease (an additional amount is tied up in accounts receivable instead of becoming cash and cash equivalents).
- b. The increase of SEK 50,000 in accounts payables means that a) working capital decrease (the difference between current assets (unchanged) – current liabilities (which increase) decrease) and b) cash and cash equivalents increase (less have to be paid to the suppliers but can instead stay as cash and cash equivalents).
- c. The increase in inventory of SEK 70,000 means that a) working capital increase (the difference between current assets (that increase) – current liabilities (unchanged) increase) and b) cash and cash equivalents decrease (an additional amount is tied up in inventory instead of becoming cash and cash equivalents).

9:8 Flödet HB

Working capital is calculated as number of days x units per day x cash outflow per unit.

Need for capital to cover for material = $20 - 15 + 8 + 10 + 30 = 53$ days \times 1,300 units \times SEK 15 = SEK 1,033,500

Need for capital to cover for work = 8 days \times 1,300 units \times SEK 20/2 + (10 + 30 =) 40 days \times 1,300 units \times SEK 20 = SEK 1,144,000

Total need of working capital = SEK 1,033,500 + SEK 1,144,000 = SEK 2,177,500

Total need of capital = working capital SEK 2,177,500 + fixed capital SEK 800,000 + safety capital SEK 200,000 = SEK 3,177,500

So, the answers will be:

- a. The company will tie up SEK 2,177,500 in working capital
- b. The company will tie up SEK 3,177,500 in total capital
- c. The company will tie up SEK 1,144,000 in work and 1,033,500 in material

9:9 Röjmix AB

Working capital is calculated as number of days x units per day x cash outflow per unit.

Raw material inventory = 10 days x 1 200 units x SEK 42 = SEK 504,000

Accounts payable = -14 days x 1 200 units x SEK 42 = SEK -705,600

Work in progress = 2 days x 1 200 units x SEK 42 + 2 days x 1 200 units x SEK 5/2 = SEK 106,800

Finished goods inventory = 2 days x 1 200 units x (SEK 42 + SEK 5) = SEK 112,800

Accounts receivable = 14 days x 1 200 units x (SEK 42 + SEK 5) = SEK 789,600

- a. Total need for working capital = SEK 504,000 - SEK 705,600 + SEK 106,800 + SEK 112,800 + SEK 789,600 = SEK 807,600
- b. The total requirement for capital is SEK 807,600 + SEK 200,000 + SEK 50,000 = SEK 1,057,000

9:10 Entender

Working capital is calculated as number of days x units per day x cash outflow per unit.

Need for capital to cover for material = 12 - 15 + 6 + 30 + 30 = 63 days x 800 units x SEK 35 = SEK 1,764,000

Need for capital to cover for work = 6 days x 800 units x SEK 50/2 + (30 + 30 =) 60 days x 800 units x SEK 50 = SEK 2,520,000

Working capital is calculated as units per day x SEK per unit x number of days

Total need of working capital = SEK 1,764,000 + SEK 2,520,000 = SEK 4,284,000

Total need of capital = working capital SEK 4,284,000 + fixed capital SEK 1,500,000 + safety capital SEK 300,000 = SEK 6,084,000

9:11 TranasAB

Working capital is calculated as number of days x units per day x cash outflow per unit.

Need for capital to cover for material = 20 - 15 + 20 + 20 + 15 = 45 days x 1,300 units x SEK 400 = SEK 101,400,000

Need for capital to cover for work = 20 days x 1,300 units x SEK 1,200/2 + (20 + 15 =) 35 days x 1,300 units x SEK 1,200 = SEK 70,200,000

- a. The need for working capital = SEK 31,320,000 + SEK 70,200,000 = SEK 101,400,000
- b. The total capital needed = SEK 101,400,000 + SEK 50,000,000 + SEK 10,000,000 = SEK 161,400,000

9:12 Mognertser

Working capital is calculated as number of days x units per day x cash outflow per unit.

Raw material inventory = 10 days x 400 units x SEK 50 = *SEK 200,000*

Work in progress = 5 days x 400 units x SEK 50 + 4 days x 400 units x SEK 30/2 = SEK 100,000 + SEK 30,000 = *SEK 130,000*

Finished goods inventory = 15 days x 400 units x (SEK 50 + SEK 30) = *SEK 480,000*

Accounts receivable = 20 days x 400 units x (SEK 50 + SEK 30) = *SEK 640,000*

Accounts payable = -30 days x 400 units x SEK 50 = *SEK -600,000*

Total need for working capital = SEK 200,000 + SEK 130,000 + SEK 480,000 + SEK 640,000 – SEK 600,000 = *SEK 850,000*

9:13 Kapitalis AB

The number of units is (50,400/360 days) = 140 units per day

Working capital is calculated as number of days x units per day x cash outflow per unit.

- a. Raw material inventory = 20 days x 140 units x SEK 210 = *SEK 588,000*
- b. Accounts payable = -5 days x 140 units x SEK 210 = *SEK -441,000*
- c. Work in progress = 10 days x 140 units x SEK 210 + 10 days x 140 units x SEK 120/2 = *SEK 378,000*
- d. Finished goods inventory = 10 days x 140 units x (SEK 210 + SEK 120) = *SEK 462,000*
- e. Accounts receivable = 30 days x 140 units x (SEK 210 + SEK 120) = *SEK 1,386,000*
- f. Total need for working capital = SEK 588,000 – SEK 441,000 + SEK 378,000 + SEK 462,000 + SEK 1,386,000 = *SEK 2,373,000*

9:14 KapitAB

Working capital is calculated as number of days x units per day x cash outflow per unit.

Raw material inventory = 20 days x 800 units x SEK 220 = *SEK 3,520,000*

Work in progress = 4 days x 800 units x SEK 220 + 4 days x 800 units x SEK 180/2 = SEK 704,000 + SEK 288,000 = *SEK 992,000*

Finished goods inventory = 10 days x 800 units x (SEK 220 + SEK 180) = *SEK 3,200,000*

Accounts receivable = 30 days x 800 units x (SEK 220 + SEK 180) = *SEK 9,600,000*

Accounts payable = -14 days x 800 units x SEK 220 = *SEK -2,464,000*

Total need for working capital = SEK 3,520,000 + SEK 992,000 + SEK 3,200,000 + SEK 9,600,000 – SEK 2,464,000 = *SEK 14,848,000*

9:15 Brebro [20 points]

- a. The need for working capital increase, since an increase in the average time in the raw material inventory must mean that the average inventory increase. The need for fixed capital isn't affected by this.

- b. Neither the need for working capital nor the need for fixed capital is affected from this.
- c. The need for working capital isn't affected by this. The need for fixed capital increase, since non-current assets increase.
- d. The need for working capital isn't affected by this. The need for fixed capital decrease, since the non-current liabilities increase.
- e. The need for working capital increase, since this leads to more capital tied in accounts receivables. The need for fixed capital isn't affected by this.

9:16 The need for capital

- a. The need for working capital decrease. That the inventory turnover rate, sales divided with inventory, increase but sales haven't changed must mean that the inventory is decreasing and therefore less capital is tied in inventory. The need for fixed capital isn't affected by this
- b. Neither the need for working capital nor the need for fixed capital is affected from this
- c. The need for fixed capital increase, unless the company can borrow money for this investment, since the non-current assets increase. The need for working capital isn't affected by this
- d. The need for working capital increase, since an increase in the average time in the raw material inventory must mean that the average inventory increase. The need for fixed capital isn't affected by this
- e. The need for working capital decrease, since a decrease in the average time in the finished goods inventory must mean that the average inventory decrease. The need for fixed capital isn't affected by this
- f. The need for working capital decrease, since a decrease in the accounts receivable time must mean that current assets in the form of accounts receivable decrease. The need for fixed capital isn't affected by this
- g. The need for working capital increase, since a decrease in the accounts payable time must mean that finance in the form of accounts payable decrease. The need for fixed capital isn't affected by this
- h. The need for fixed capital increase, unless the company can borrow for this investment, since non-current assets increase. The need for working capital isn't affected by this
- i. Probably, this means that both the need for working capital in the form of e.g. inventory and accounts receivable (but less e.g. accounts payable) and the need for fixed capital in the form of e.g. machines and similar (but less e.g. borrowings for this) increase
- j. The need for working capital increase, since this leads to more capital tied in accounts receivables. The need for fixed capital isn't affected by this

9:17 Spanjilas AB

Working capital is calculated as number of days x units per day x cash outflow per unit.

- a. Raw material inventory = 10 days x 10 units x SEK 2,400 = SEK 240,000
- b. Work in progress = 10 days x 10 units x SEK 2,400 + 10 days x 10 units x SEK 16,000/2 = SEK 240,000 + SEK 800,000 = SEK 1,040,000
- c. Finished goods inventory = 1 day x 10 units x (SEK 2,400 + SEK 16,000) = SEK 184,000

- d. Accounts receivable = 30 days x 10 units x (SEK 2,400 + SEK 16,000) = **SEK 5,520,000**
- e. Accounts payable = -30 days x 10 units x SEK 2,400 = **SEK -720,000**
- f. Total need for working capital = SEK 240,000 + SEK 1,040,000 + SEK 184,000 + SEK 5,520,000 – SEK 720,000 = **SEK 6,264,000**
- g. Total need for fixed capital = Non-current assets SEK 3,000,000 – Non-current liabilities SEK 2,500,000 = **SEK 500,000**
- h. Total need for capital = Working capital SEK 6,264,000 + Fixed capital SEK 500,000 + Safety capital SEK 1,000,000 = **SEK 7,764,000**
- i. Need for capital to cover for material = $10 - 30 + 10 + 1 + 30 = 21$ days x 10 units x SEK 2,400 = **SEK 504,000**

9:18 Spunkis

Working capital is calculated as number of days x units per day x cash outflow per unit.

- a. Raw material inventory = 15 days x 5,000 units x SEK 50 = **SEK 3,750,000**
- b. Work in progress = 30 days x 5,000 units x SEK 50 + 30 days x 5,000 units x SEK 14/2 = SEK 7,500,000 + SEK 1,050,000 = **SEK 8,550,000**
- c. Finished goods inventory = 20 days x 5,000 units x (SEK 50 + SEK 14) = **SEK 6,400,000**
- d. Accounts receivable = 30 days x 5,000 units x (SEK 50 + SEK 14) = **SEK 9,600,000**
- e. Accounts payable = -30 days x 5,000 units x SEK 50 = **-SEK 7,500,000**
- f. Total need for working capital = SEK 3,750,000 + SEK 8,550,000 + SEK 6,400,000 + SEK 9,600,000 – SEK 7,500,000 = **SEK 20,800,000**
- g. Total need for fixed capital = Non-current assets (SEK 2,500,000 + SEK 1,400,000) – Non-current liabilities SEK 3,900,000 = **SEK 0**
- h. Total need for capital = Working capital SEK 20,800,000 + Fixed capital SEK 0 + Safety capital SEK 500,000 = **SEK 21,300,000**
- i. Need for capital to cover for work = 30 days x 5,000 units x SEK 14/2 + (20 + 30 =) 50 days x 5,000 units x SEK 14 = **SEK 4,550,000**

9:19 Startertz Ltd

Working capital is calculated as number of days x units per day x cash outflow per unit

- a. Need for capital to cover for material = $45 - 30 + 10 + 20 + 30 = 75$ days x 80 units x SEK 64 = **SEK 384,000**
- b. Need for capital to cover for work = $10/2 + 20 + 30 = 55$ days x 80 units x SEK 430 = **SEK 1,892,000**
- c. Total need for working capital = SEK 384,000 + SEK 1,892,000 = **SEK 2,276,000**
- d. Total need for fixed capital = Non-current assets SEK 1,200,000 – Non-current liabilities SEK 800,000 = **SEK 400,000**
- e. Total need for capital = Working capital SEK 2,276,000 + Fixed capital SEK 400,000 + Safety capital SEK 200,000 = **SEK 2,876,000**
- f. Startertz need to somehow find that capital to be kept in the company in the foreseeable

future. So, they need to ask the owners for that sum in equity, ask the bank for more money, or find other means to finance this.

9:20 The need for capital

- a. The need for working capital decrease. That the inventory turnover rate, sales divided with inventory, increase but sales haven't changed must mean that the inventory is decreasing and therefore less capital is tied in inventory. The need for fixed capital isn't affected by this
- b. Neither the need for working capital nor the need for fixed capital is affected from this
- c. The need for fixed capital increase, unless the company can borrow money for this investment, since the non-current assets increase. The need for working capital isn't affected by this
- d. The need for working capital increase, since an increase in the average time in the raw material inventory must mean that the average inventory increase. The need for fixed capital isn't affected by this
- e. The need for working capital decrease, since a decrease in the average time in the finished goods inventory must mean that the average inventory decrease. The need for fixed capital isn't affected by this
- f. The need for working capital decrease, since a decrease in the accounts receivable time must mean that current assets in the form of accounts receivable decrease. The need for fixed capital isn't affected by this
- g. The need for working capital increase, since a decrease in the accounts payable time must mean that finance in the form of accounts payable decrease. The need for fixed capital isn't affected by this
- h. The need for fixed capital increase, unless the company can borrow for this investment, since non-current assets increase. The need for working capital isn't affected by this
- i. Probably, this means that both the need for working capital in the form of e.g. inventory and accounts receivable (but less e.g. accounts payable) and the need for fixed capital in the form of e.g. machines and similar (but less e.g. borrowings for this) increase
- j. The need for working capital increase, since this leads to more capital tied in accounts receivables. The need for fixed capital isn't affected by this

9:21 Rattarum

Working capital is calculated as number of days x units per day x cash outflow per unit

- a. Raw material inventory = 15 days x 24,000 units x SEK 2.40 = SEK 864,000
- b. Work in progress = 4 days x 24,000 units x SEK 2.40 + 4 days x 24,000 units x SEK 1.20/2 = SEK 230,400 + SEK 57,600 = SEK 288,000
- c. Finished goods inventory = 30 days x 24,000 units x (SEK 2.40 + 1.20) = SEK 2,592,000
- d. Accounts receivable = 30 days x 24,000 units x (SEK 2.40 + SEK 1.20) = SEK 2,592,000
- e. Accounts payable = -10 days x 24,000 units x SEK 2.40 = SEK -576,000
- f. Total need for working capital = SEK 864,000 + SEK 288,000 + SEK 2,592,000 + SEK 2,592,000 - SEK 576,000 = SEK 5,760,000
- g. Total need for fixed capital = Non-current assets (SEK 1,000,000 + SEK 800,000) - Non-

current liabilities SEK 700,000 = *SEK 1,100,000*

- h. Total need for capital = Working capital SEK 5,760,000 + Fixed capital SEK 1,100,000 + Safety capital SEK 200,000 = *SEK 7,060,000*
- i. Need for capital to cover for material = $15 - 10 + 4 + 30 + 30 = 69 \text{ days} \times 24,000 \text{ units} \times \text{SEK } 2.40 = \text{SEK } 3,974,400$