UNIVERSITY
OF SKÖVDE

School of Engineering

WRITTEN EXAMINATION

Course Fundamentals of Production Engineering

Sub-course

Course code PR033G

Credits for written examination 3hp

Date 2026-09-025

Examination time 830-1230

Examination responsible Victor Hedén

Teachers concerned

Aid at the exam/appendices

Other

Instructions

- ☐ Take a new sheet of paper for each teacher.
- ☒ Take a new sheet of paper when starting a new question (part questions on the same paper.
- ☒ Write only on one side of the paper.
- ☒ Write your name and personal ID No. on all pages you hand in.
- ☒ Use page numbering.
- ☒ Don´t use a red pen.
- ☒ Mark answered questions with a cross on the cover sheet.

UNIVERSITY
OF SKÖVDE

Grade points

Grading results U,G,VG	Grading results: A-F
U = less than 6p/Part	A = 4*VG
G = 6-10p/Part	B = 3*VG + 1G
VG=11-15p/Part	C = 2*VG + 2*G
	D = 1 VG +3*G
	E = 4*G
	F = Less than G on any Part

Grading limits to get the least pass are required G on each part A, B, C and D. If any part is judged as U, all parts must be re-examined.

Examination results should be made public within 18 working days

Good luck!

Total number of pages 6

UNIVERSITY
OF SKÖVDE

Part A (questions 1, 2, 3) General questions Total 15p

Question 1) Muda, Muri and Mura(8p)

a. What does Muda mean in Lean? (2p)
b. In the course we have discussed different types of Muda. **Name and give an short example** on it for 4 (by your choice) of them.(4p)
c. What does Muri and Mura mean? (2p)

Question 2) (3p)

In the course we have discussed Value, **what is Value**?

Question 3) Time concept (4p)

Identify and briefly explain four production-related time concepts. (1 point per concept.)

UNIVERSITY
OF SKÖVDE

Part B (question 4.5) Production preparation Total 15p

Question 4) Industrial layout 7p

Choose one factory layout presented in the course book. Use the same chosen layout when answering all three parts.

a) Describe the layout and explain how the production process is organized within it. (3p)

b) Give an example of a production situation where this layout would be suitable, and explain why. (2p)

c) Discuss one advantage and one disadvantage associated with this layout. (2p)

Question 5) Preparation (8p)

A manufacturing company has developed a new product and is now preparing it for production.

Explain how you would prepare the new product for manufacturing. Describe the main activities involved in the process planning, from product information to a defined production process.

UNIVERSITY
OF SKÖVDE

Part C (questions 6, 7) Production and problem solving Total 15p

Question 6) Leveling (9p)

A manufacturing company produces three different products using the same production system. The production capacity is 1,000 items per day, and the factory operates 5 days per week.

Due to long changeover times between different products, the company can currently perform a maximum of 3 changeovers per month while still meeting customer delivery requirements.

With 20 working days per month, the company has a total monthly production capacity of 20,000 items.

The monthly demand for the different products is presented in the table 1 below:

Article	Number per months
A	6000
B	12 000
C	2000

Table 1: Monthly demand for products A, B and C.

The person responsible for the planning has chosen to produce first 6000 A then 12000 B and then 2000 C, after that the person starts with A again and so on.

a) **Motivate** what is good about this planning. (2p)

The customer now wants to go from having a locked plan of 1 months to 1 week and maybe further down to only 1 day. Locked means that the customer is not allowed to change the plan.

b) **Describe** how you should plan to cope with 1 week and 1 day locked plan respectively. (Leveling the production correctly regarding to lower the waiting time) (2p)
c) **Describe a clear requirement** that this entails for the process and **motivate** this. (2p)
d) **Describe a tool / method** that can help you more easily meet the requirement in 6C above. **Also give a motivation** for why it helps you (3p)

UNIVERSITY
OF SKÖVDE

Question 7) Problem-Solving methods and tools (6p)

Choose and name 2 problem-solving methods or tools that have been covered in the course. For each method or tool:

- Explain its purpose.
- Describe shortly how it is used in practice.
- Explain how it can support the problem-solving process.

You may not choose the method/tool that you used in Question 6d.

Maximum 3 points per method/tool.

UNIVERSITY
OF SKÖVDE

Part D (questions 8, 9) Production logistics Total 15p

Question 8 Production planning (8p)

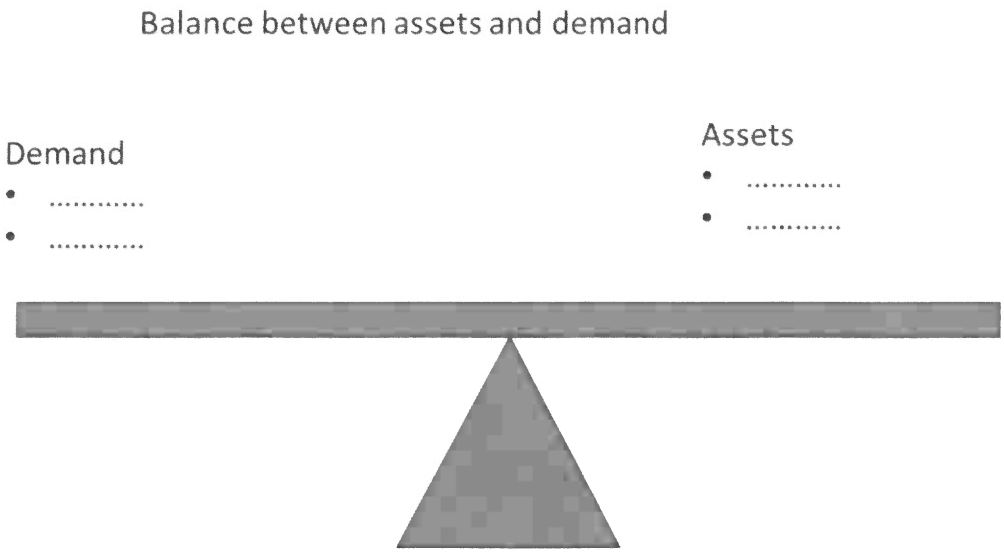
The MRP II model separates planning activities in 4 different levels, where the Master production schedule is the actual starting point for planning production.

a)This schedule/plan should answer to 4 specific questions. The first is which product we should produce. Which are the following 3 questions? (3p)

The picture below describes the balance between assets and demand which has to be accomplished by the master production planning.

b) Define what is meant by assets and demand. (2p)

c)Explain possible consequences in case of an unbalanced situation. (3p)



Question 9 Kanban systems (7p)

a) Describe thoroughly a Kanban system and explain the function of it. (4p)
b) Describe a supermarket solution in combination with a Kanban board. (3p)