UNIVERSITY
OF SKÖVDE

School of Engineering

WRITTEN EXAMINATION

Course Industrial Engineering

Sub-course

Course code PR033G

Credits for written examination 3hp

Date 2025-11-07

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.

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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

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

Question 1) (8p)

Waste and problems in production sometimes occur. In the course we have talked about 7 + 1 waste based on Lean production

a. Most people understand that waste (Muda) is not good. In production muda will show in **2 different ways, which two?** (2p)
b. In Lean production, people talk about waste. **Name and give an short example** on it for 6 (by your choice) of the "7+1" waste category's. (6p)

Question 2) (3p)

You often talk about time when you discussing production. When you look from the customers perspective you often divide time in to 3 categories. **Name the 3 and give 1 production-related example for each of these three categories of time.**

Question 3) Time concept (4p)

Describe shortly and define 4 production-related time concepts, you must not discuss them in question 2 above, (1p for each time concept)

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Part B (question 4.5) Production preparation Total 15p

Question 4) Industrial layout 7p

a) The course book discusses four different factory layouts. One of these is "Batch Flow system" (also called "cell"). **Choose one** of the other three factory layouts from the book and **explain** how it works. (3p)
b) When is it **appropriate to choose your** chosen type of layout? **Motivate** your answer. (2p)
c) **Describe one advantage and one disadvantage** of the layout type **you** have chosen. (2p)

Question 5) Preparation (8p)

Process planning or Production preparation involves the activities that prepare, adjust and modify product structures, as well as documentation for manufacturing in terms of operational sequences and operating times.

Describe the steps in Process planning when you should plan a new product in your production.

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

Question 6) Leveling (9p)

Right now, your company can produce 1000 items per day and you produce 5 days per week. In the process you have long changeover times between different articles, at the moment the company only has time to do 3 changeovers per month (, in order to deliver in time to customer).
For 1 months, you produce a total of 20,000 items (20 working days per month). The demand during one months can be seen in the table below:

Article	Number per months
A	8000
B	10 000
C	2000

a) **Show with a graph/diagram and describe** how you should plan (no layout) the production **and explain why.** (3p)
b) The company wants to be able to produce all three articles every day. Name one thing that is very important to do in the process, to be able to produce all three articles in the same day? (1p)
c) **What does the production gain if it is possible to produce different articles in the same day, explain?** (2p)
d) **Describe a tool / method** that can help you more easily meet the requirement in 6b above. (3p)

Question 7) Problem solving (6p)

In the course we have discussed many different tool/ methods that helps you in the problem solving. **Choose and name 3 methods / tools** that we have used during the course and **explain detailed the 3 methods / tools how you use them** (you are not allowed to choose the one you use in 6d). (max 2p per method / tool). (6p)

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

Question 8) Logistics in the workplace (9p)

When planning the workplace, it is important to also consider how we should get material to and from the workplace. It also applies that the operator has the items when the operator needs them.

a. **Show with an example** why it is important to take the total cost into account when buying materials to production. (3p)
b. **Show with a figure and describe** how the internal logistics can be handled using a Kanban system. (4p)
c. It is important in which order you use the products between the different stations when for example using a Kanban system. **Describe why it is important** to use the products in a specific order. (2p)

Question 9 Production planning (6p)

When it comes to production planning, there are different methods of planning; net demand planning, Reordering point and more.

a) **Describe** a reordering point-system both in words and a figure. (4p)
b) In the production it can happen thing that are out of your control. Companies often use safety stocks to guard them self from those uncertainties. **Explain 2 uncertainties / things** that safety stock helps you to deal with. (2p)