

Surname and initials: _____

Student number: _____

Examination cover sheet

(to be completed by the examiner)

Course name: Principles of data protection Course code: 2IMS25

Date: 18/1/2021

Start time: 18:00 End time: 21.45

Number of pages: 7 (Part A) + 5 (Part B) + 1 (Attachment 1) + 4 (Attachment 2)

Number of questions: 6

Maximum number of points/distribution of points over questions: 10

Method of determining final grade: Final exam

Answering style: formulation, order, argumentation, multiple choice: open questions

Exam inspection:

Other remarks:

INSTRUCTIONS FOR STUDENTS AND INVIGILATORS (to be indicated by examiner)

Write in black or blue. Pencil only allowed for drawings.

Permitted examination aids (to be supplied by students):

- Computer
- Calculator Graphic
- Calculator
- Lecture notes/book
- One A4 sheet of annotations

Dictionaries. If yes, please specify:

Important:

- an exam >90 minutes consists of a Part A and a Part B. Part A needs to be collected after 90 minutes, before handing out part B. Ensure students are aware of this
- students that started on part B of the exam, are only allowed to hand it in and leave the room after the simultaneously conducted online exam part B has started. This is 11.05 (morning), 15.35 (afternoon)
- examinees are only permitted to visit the toilets under supervision
- it is not permitted to leave the examination room within 15 minutes of the start and within the final 15 minutes of the examination, unless stated otherwise
- examination scripts (fully completed examination paper, stating name, student number, etc.) must always be handed in
- the house rules must be observed during the examination
- the instructions of subject experts and invigilators must be followed
- keep your work place as clean as possible: put pencil case and

breadbox away, limit snacks and drinks

- examinees are not permitted to share examination aids or lend them to each other

During written examinations, the following actions will in any case be deemed to constitute fraud or attempted fraud:

- using another person's proof of identity/campus card (student identity card)
- having a mobile telephone or any other type of media-carrying device on your desk or in your clothes
- using, or attempting to use, unauthorized resources and aids, such as the internet, a mobile telephone, smartwatch, smart glasses etc.
- having any paper at hand other than that provided by TU/e, unless stated otherwise
- copying (in any form)
- visiting the toilet (or going outside) without permission or supervision

The final grade will be announced no later than fifteen working days after this examination took place. Final grades of first-year bachelor study components in Q4 will be announced within 5 working days. Final test grades of bachelor study components in the interim period will be announced no later than 5 working days before the 1st of September.

Exercises

1	2	3
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Surname, First name

Principles of data protection (2IMS25)
Exam 18/1/2021 (OnCampus - Part A)

1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9
0	0	0	0	0	0	0

DAC

- 1.5p **1** Storing permissions in an access matrix is typically not a practical solution in real-world systems. Discuss what the underlying problems are and explain which approaches can be adopted to implement an access matrix in a practical way along with their advantages and disadvantages.

RT

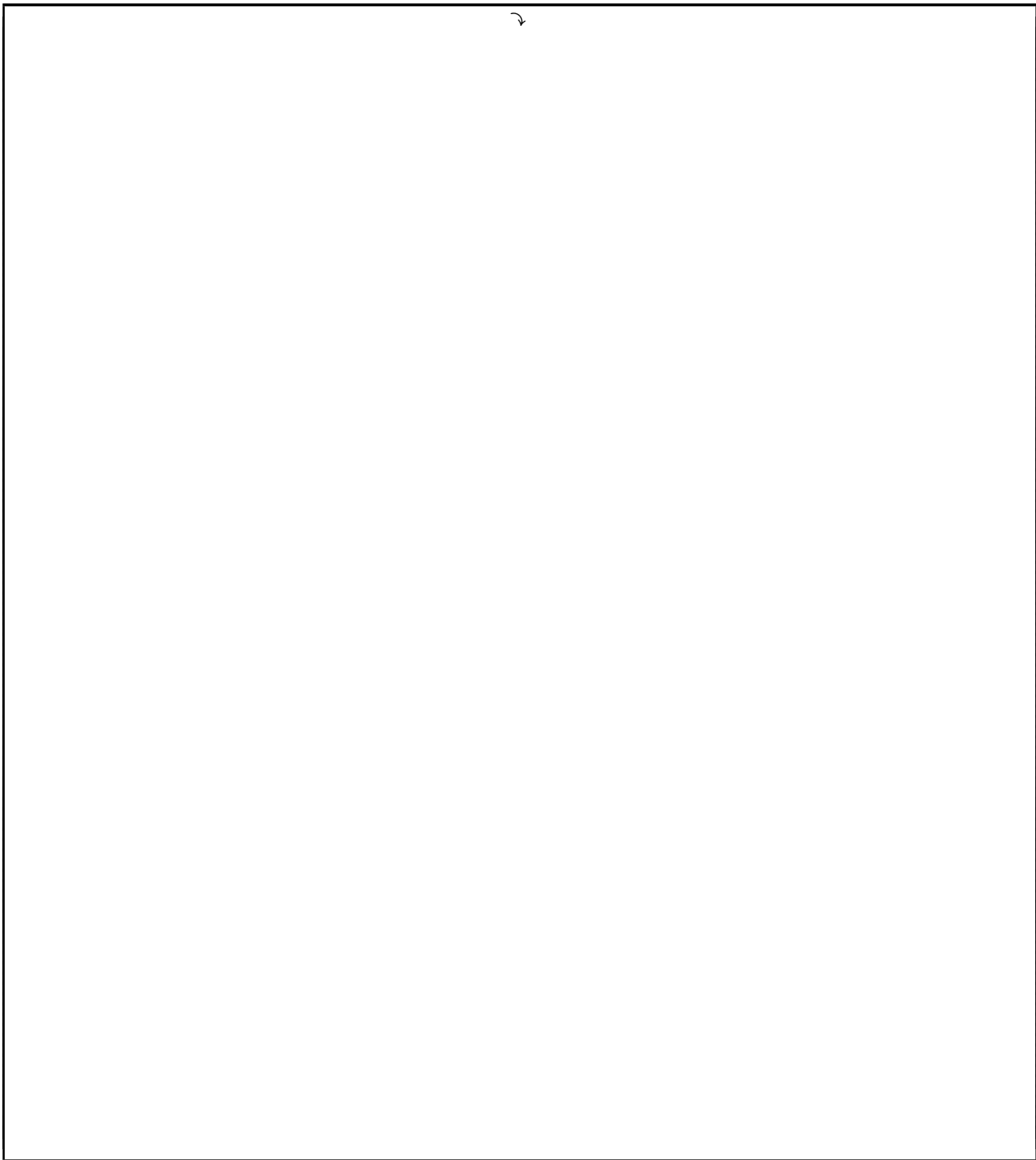
- 1p **2a** Explain what is "delegation" in RT , and what is "attribute based delegation", write a simple RT_0 policy that involves delegation and a simple RT_0 policy involving attribute based delegation.

1p **2b** Consider the following RT_0 policy.

$$A.t \leftarrow A.t.s$$
$$A.t \leftarrow B$$
$$B.t \leftarrow J$$
$$B.t \leftarrow K$$
$$B.s \leftarrow B.t.s$$
$$B.r \leftarrow A$$
$$B.r \leftarrow B$$
$$K.s \leftarrow A$$
$$K.s \leftarrow B$$
$$K.s \leftarrow C$$
$$K.t \leftarrow F$$
$$K.t \leftarrow G$$
$$K.t \leftarrow H$$
$$K.v \leftarrow L$$
$$K.v \leftarrow M$$
$$K.v \leftarrow N$$
$$J.s \leftarrow J$$

1. Find all principals populating $A.t$ (which means, compute $[[A.t]]$).
2. Write down the graph generated by the top-down algorithm when computing the semantics of $A.t$. (the top-down algorithm is also known as the "backward algorithm").





UCON

1.5p **3** Represent RBAC_1 in UCON_{ABC} .

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