Collection of exam information, especially for the Zoom possibility

There is a lot of information now about oral exams in Zoom for this course. Below I have gathered information that has been spread out. There will still be additional information later.

Note that there will be a review session for everyone on June 19 at 13:00. I will send a Zoom link later.

If you want a "normal" oral exam, instead of Zoom exam, please remember to send email to Joan Boyar by Sunday, June 7.

The topics are the following, in either exam form:

1. Pumping lemmas, and pushdown automata and context-free languages
2. Turing machines
3. Decidability
4. Reducibility
5. NP-completeness proofs – examples.
6. Proof that SATISFIABILITY is NP-complete (do not assume that there is a known NP-Complete problem — use the proof in Sipser's book).
7. Information-theoretic lower bounds (lower bounds proven by counting leaves in decision trees), especially the average case bounds for sorting by comparisons.
8. Adversary arguments – technique, examples.
9. Median problem – algorithm and lower bound.
10. Approximation algorithms
11. Parameterized complexity

Søren Sten Hansen wrote the following announcement on the course Announcements in Blackboard:

"The Study Board have decided that the exams in June and August will be held online regardless of whether SDU physically reopens before the exam date. The oral exam is thus conducted online via Zoom.

https://mitsdu.dk/en/vejledning/studieregler/eksamen/mundtlig_proeve

In the coming weeks you will receive more information from your lecturers and administration about the practical conditions for the exam in June."

You received the following from me via Announcements in Blackboard:

"The exam in this course will be done via Zoom, not physically at SDU. As I said earlier, the exam topics/questions on the course homepage are the

ones we will use. Your presentation should not be as long as planned then; make it only 8 minutes. Think about what software you can use to mimic a classroom blackboard as much as possible, so you can write on it and share your screen with me. (For example, if it was me, I think I would use xournal, and just a text editor is better than nothing, but makes drawing a graph difficult, for example.); I will give more information later, but this should allow you to continue preparing for your exam, after completing your assignment."

Yesterday, I received the guidelines the faculty has. You may have received them too, or you should later:

http://imada.sdu.dk/~joan/dm553/zoomstudents.pdf

http://imada.sdu.dk/~joan/dm553/zoomstudents2.pdf

The second link is probably the more important. Earlier, through an email, I received the following explanation of the last point on the second link (which he originally gave us in Danish) from Søren Sten Hansen:

"med det foreliggende grundlag forstås hvad der er sket under den mundtlige eksaminationen inden afbrydelsen. Der ligges således ikke til grund, hvad ens oplevelse uden for eksaminationen har været. Det vil således også afhænge af hvor meget af eksamination der var tilbage, da eksaminationen blev afbrudt og det konstateres at det ikke er muligt at genetablere forbindelsen.

Formålet med de regler vi udarbejder er at gøre det tydeligt for de studerende at der ikke kan opnås nogen fordel ved fx at afbryde forbindelsen bevidst, hvis det fx går dårligt under eksaminationen."

Note that I may not necessarily follow the instructions concerning waiting rooms in Zoom, since for other courses it has apparently worked well using breakout rooms, instead. If I make that change, I will let you know.

As some further information, the exam will still last about 30 minutes total, including the time to discuss your grade with the external examiner. You will start by showing me your picture ID. Then you will choose a question as follows: you will give me a number between 1 and 11, which I will use to calculate your random question number. (I will have my own number between 1 and 11, which the external examiner will know in advance, I will add your number to mine modulo 11, and then add 1.) You will have one minute to review your notes on that subject and begin presenting it. You will have 8 minutes for your presentation. After that I will ask you more questions about course material, possibly including questions concerning your assignments.

During your presentation, you can glance a couple of times at your notes, but they should not be used much (mostly only as a reminder of what you want to talk about next). No notes, slides or other material should be used after the presentation. (An exception to this rules would be using the slides on the course homepage for the Cook-Levin Theorem, the proof that SATISFIABILITY is NP-Complete. However, that exact formula is less important than the reasons for it, so you may not have time to use those slides.) If you want help from me at any time, do ask. If anything I say is unclear to you, please ask quickly, rather than wasting time. In preparing your presentation, you will have to decide what to include and what not to include. When choosing between topics, remember

that a good presentation of hard material is best, but a bad presentation of hard material is worse than a good presentation of less hard material. Your goal is to convince me and the external examiner that you understand a lot.

If you can do so, try to do a presentation (and answer questions) as much as possible as if you were using a blackboard in a classroom. Since it is more difficult to draw nicely quickly using software than using a real blackboard, you should probably write and/or draw less than you would on a blackboard. Speak very clearly to make up for this.

As another suggestion (in addition to xournal) as to what software can be used, instead of xournal, you could look at https://whiteboard.explaineverything.com/. (Note that you may use anything you are familiar with, including an editor. Make it easy for yourself.) It seems to work on any platform (it worked for me). If you use this, just run it locally on your computer and share your screen (this is possible in Zoom) to show it to me and the external examiner. (This is a program which would allow us to write on your "whiteboard" too, but we will not use this feature.) There is also a whiteboard in Zoom which you could try. I found xournal easiest (I am on Linux, and I do not know if it runs on other platforms), then the whiteboard with the link above, then the whiteboard in Zoom, but you may have other experiences.

Assuming that you use some software to simulate using a blackboard, practice with it in advance. I find that it is much easier to type something than to draw, so practice using that too. The most likely thing for you to draw will probably be a small graph. For typing, do something fast, rather than making things look perfect. For example, avoid subscripts, by writing the subscript after what you are putting the subscript on, and using something other than Greek letters. A table might be easier to type than to draw; you could explain that it is a table. For $\leq$, you can write <=. Abbreviate when it is clear. Etc.

It is important when using this software that you make the font large enough for me to see it, despite my eyesight problems up close. In xournal, you can make the application full screen, then make the paper part of the application cover the full screen (for me using CNTL + two times does it), and then use black and size 28 font is sufficient. Prepare the application as a blank page before your exam starts, so you do not waste time during the exam.

The university rules are that no one may record the exam session.

As mentioned earlier, the faculty rules are that if there are problems with the Internet connection, your presentation on your oral will be judged by what has happened so far. Unfortunately, a -3 on the oral exam cannot be brought up enough by the assignments to get a passing grade, but there will be a re-exam in August. However, the assignments will count towards the final grade, with the third assignment counting more than I had planned in January/February.

1 Newer information:

You will receive a Zoom URL later. As suggested above, I plan to use breakout rooms in Zoom, no waiting rooms.

When you follow the directions from the faculty to use that Zoom URL, you will get to the main room, where there are likely to be other students also waiting. When it is your turn, I will put you in a breakout room, where the external examiner and I will examine you. You will need to click on "Join" when I invite you to the breakout room. When your exam is over, the external examiner and I will go to another breakout room to discuss your grade. Then we will return to your breakout room to give you your grade. Then you may return to the main room or leave the Zoom session any time after that.

I will be in the main room each time I put a student in the breakout room. Students waiting for their exam time should be able to follow who is moved into a breakout room (I plan to announce it via chat in Zoom) and compare with the schedule they receive through Blackboard to know when it is their turn. You should arrive early enough to make sure that you are there when everyone before you has either not shown up or been examined. If there is no one in the waiting room, we will assume that no one else is coming and leave. Arriving the later of the official starting time for the exams on your day and two hours early should be sufficient.

Specify your full name on entering Zoom, so I can tell who to bring into the waiting room when it is your time. There are several students in the class with the same first name, so your first name may not be sufficient.

Note that with further testing, I am convinced that font size 28 will be sufficient for me in xournal if you enlarge to full screen.