Examen Project Management and Scheduling - Januari 2020

1. Draw an activity on the arc (based on a table where the durations and direct predecessor of all the activities were given)
   - Calculate TS, FS, SS and IS for activity C

2. We have a resource constrained project scheduling problem, we see that at time m=0 there is a resource constraint violation. Determine ALL the different delaying modes that will happen in the branch & bound tree.
- We see that one of the options is to delay activity 2. Calculate the lower bound based on the critical path
- Also calculate the critical sequence based lower bound for this

3. Given: an AoN network and 4 options (a, b, c or d) for the resource profile.
- Which resource profile is the right one? We are using a priority list based on MINSLK and the priority list was also given on the exam, we are doing the **parallel forward** method. Explain briefly the steps you take (for example why are we scheduling activity 6 at a certain time?) and give the right answer a, b, d or d for the resource profile → *keep in mind the priority list and the precedence constraints and the resource constraint.*

4. We get the PV (planned value), EV (earned value) and the AC (actual cost) for a certain project.
- Calculate SV (schedule variance) for period 5
- Calculate CV (cost variance) for period 5
- What does this tell us about the time state? → *project delay*
- What does this tell us about the budget state? → *budget underrun*
- There is a problem with PV, what is this problem and what is an alternative measure for this problem? → *PV will always go to zero at the end of the project, regardless the state of the project, alternative measure is PV with ES (earned schedule)*
- Calculate the alternative measure for period 5

5. Kelly & Fulkerson, given: table with the crash duration, normal durations and crash costs, also the AoA was given
- Do all the iterations, and draw the time-cost graph, you don't need to write everything down completely

6. We get an example of a certain Markov Decision Process (graph is given). Given: the table with the probabilities for the realized activity durations, we already got 3 schedule representations (s1, s2, s3), we got cost per unit time wb, the fixed cost per reaction wr and we got the deadend cost M.
- In the Markov Decision Process graph, some numbers or probabilities were missing: calculate these transition probabilities end the missing costs that are missing in the graph
- Find the optimal policy for this problem/ graph..