MEC-E7001 Examination 19.2.2019

Write full sentences using clear and readable fonts

1. Describe the following optimization problem types (application examples?), especially from the difficulty of optimal solving point of view. Which solving methods can be used for each?
    a) Linear problem
    b) Linear integer problem
    c) Nonlinear convex problem
    d) Nonlinear problem with integer constraints
2. Explain how linear regression modeling works. What is the function of the constants in the model and how can their effects and significances be evaluated? Why is such evaluation useful? How are the values of the constants determined?
3. Describe how the following factors affect products' throughput time in production:
    - System utilization rate
    - Processing time variation
    - Batch size
4. How can
    a) makespan,
    b) total tardiness,
    c) maximum tardiness,
    be minimized for a single machine? You do not need to specify models in detail, just describe principle. Describe the assumptions you make concerning your system, if necessary.