MEC-E7001 Examination 15.2.2018

Write full sentences using clear and readable fonts – you may answer in Finnish or Swedish, too.

1. How can capacity of a manufacturing resource in short or medium term be adjusted in practice? How can capacity planning be formulated as an optimization model? What could be the objective and which constraints would be needed? You do not have to write the equations, textual description is sufficient.

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.