BME, Faculty of Chemical Technology and Biotechnology,
Department of Chemical and Environmental Process Engineering
BSc, Full time training
Final exam items
June 2023

Process Engineering - Hydrocarbon Technologies

1. Flowsheeting in general, characterizing and comparing solution approaches.
2. Identification of recycle loops. Use of signal-flow graphs. Selection of design variables, graphs and matrices in calculations.
3. Numerical solution of equations and systems of equations.
4. Vapor-liquid and liquid-liquid equilibria (definition, general description), measurement and thermodynamic verification of V/L equilibrium data. Modelling approaches of vapor-liquid and liquid-liquid phase equilibria in general. Neglections and corrections.
5. Activity and fugacity models. Applicability of binary interaction parameters.
6. Equilibrium and distribution calculations for vapor-liquid and liquid-liquid phase equilibria.
7. Steady state of separation columns: MESH equations, solution methods.
8. Crude oils, Essay, Transportation, Preparation, Distillation Basics, Petroleum Distillation.
9. Quality improvement technologies: heteroatom removal, dearomatization, paraffin removal.
10. Production of motor gasoline blending components: alkylation, production of oxygenates, isomerization, reforming.
11. Physical separation processes: supercritical extraction, extraction and distillation of aromatics, solvent dewaxing of base oils.
12. Conversion processes: fluid catalytic cracking and hydrocracking of vacuum gas oils; thermal cracking of vacuum residues by visbreaking and delayed coking.
13. Classification of petroleum products, product blending: motor fuel blending components and additives, properties of fuels.
14. Petrochemical technologies: steam cracking, separation of products, production of PE and PP, their main properties.