**Reconstruct the simple example presented in the class to satisfy following conditions. Be sure that you answer all the questions provided in Report section (50 pt)**

***1. Requirements***

Re-construct the same flow-sheet as the simple practice in the presentation file.

***2. Conditions***

1) Change the composition of stock mixture to **20% of Carbohydrate, 65% of glucose and 15% of protein**

2) Charging amount is **500 kg of mixture**

3) Fermentation equation = **2 moles of glucose converted into 4 moles of Ethanol and 4 moles of CO2**

4) Fermentation extent = **70%**

5) Filtration is not perfect so it filters **5% of Ethanol** while other components are filtered with **99%**

6) Scheduling conditions

Charge: based on mass flow-rate of 50kg/h

Fermentation: set up time = 10 min and process time = 2 hr, starting at the end of charging

Transfer out: process time = 30 min starting at the end of fermentation

Splitting: process time = 20 min starting at the end of transfer-out in fermentor

Filtration: same duration as splitting starting at the beginning of splitting (Set Particle Conc. Retentate = 1.00)

Transfer-out: 20 min starting at the end of filtration.

7) All other conditions are the same as the presentation file.

8) If it is not specifically indicated, please use default option.

9) Splitting: Choose “Pull out from bottom streaming”

***3. Reports***

1) Report components in **final product and waste stream in terms of** **total flow-rate, flow rate of each component and composition** (%) (15 pt)

2) Provide **Recipe scheduling information** and report the **available annual operating time and batch time for a cycle** (15 pt)

3) Provide **Gantt chart** and report **process time for each operation** (15 pt)

4) Report amount of each component in fermentor **during** **fermentation operation** (15 pt)

5) Send your **Report** and **SuperPro file** to blackboard. (40 pt)

**4. Evaluation**

Failure of condition 1, 2, 3, 4, and 5 will reduce 4 pt for each (totally 20 pt among 40 pt of SuperPro file)

Failure of condition 7 will reduce 2 pt

Failure of scheduling will reduce 3 pt for each (totally 18 pt among 40 pt of SuperPro file)

Be sure to briefly explain your answers for each question.