浙江大学 2022 - 2023 学年_夏_学期

《化工系统工程》课程期末考试试卷

课程号：81120270，开课学院：化学工程与生物工程**学院**

考试试卷：√A 卷、B 卷（请在选定项上打√）

考试形式：√闭、开卷（请在选定项上打√），允许带 **计算器** 入场

考试日期：2023 年 6 月 29 日，考试时间：120 分钟

1. (20 points)

	Supply/°C	Target/°C	F·CP/（MW/°C）
cold	20	180	0.2
hot	250	40	0.15
cold	140	230	0.3
hot	200	80	0.25
cold	150	250	0.25

HRAT = 10°C. Use problem Table to obtain the minimum utility. Show all the calculation steps

2. (10 points) In GCC, identity the total heat transferred to the fluid and stack loss .Explain how to obtain the fuenace efficiency. Finally identity the "Pockets" and explain their meaning.

（此处省略一 GCC 图）

3. (10 points) Explain graphically, why the minimum number of the units is given by N_{min} = Number of hot streams(including hot utility) + Number of cold streams(including cold utility)

hot stream 30 50 17

cold stream 25 16 56

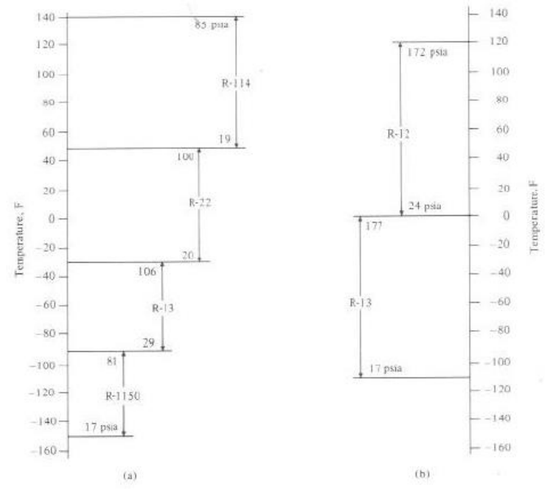
4. (20 points)

Process number	Mass load of contaminant(kg/h)	C_{IN}(ppm)	C_{OUT}(ppm)
1	2.0	0	100
2	5.0	50	100
3	30.0	50	800
4	4.0	400	800

Obtain the minimum water consumption. Show all the calculation steps

5. (10 points) Draw the wet refrigeration cycle. Explain why prefer the feed of the compressor to be at the dew point of the refrigerant ant not at a higher temperation

6. (5 points) Now you want to freeze at -10°C. What refrigerators will you choose? If you are to exhaust heat using cooling water avaliable at 20°C，后面忘了



7. (10 points) in the following DMR process, identity where the subcooling takes place for each of the two cycles

（此处省略一 Dual MR process 图）

8. (15 points) Use GAMS to solve problem 1, codes are shown below:

```
i 'hot streams'  /H1*xx/
j 'cold streams'  /C1*xx/

thin('xx') = xx; thout('xx') = xx; fh('xx') = xx
tcin('xx') = xx; tcout('xx') = xx; fc('xx') = xx
```

① Filling the code and increase lines as many as you need

② The result is as follow:

```
   VARIABLE z.L
        1   2
  H1.C1     1
  H1.C2 1
  H2.C1 1
   VARIABLE zcu.L
  H2 1
   VARIABLE zhu.L
  C2 1  C3  1
```

(此处省略每个换热器的功率和面积的结果代码)

draw the heat exchanger network and ……