Ministry of Higher Education & Scientific Research
Tikrit University
College of ..Eng.
Dept ...chemical Eng.

Final Exam
2013-2014

Class .....first .
Subject: .programming
Time.....3hr.....

Form (B)

Note : Answer all questions

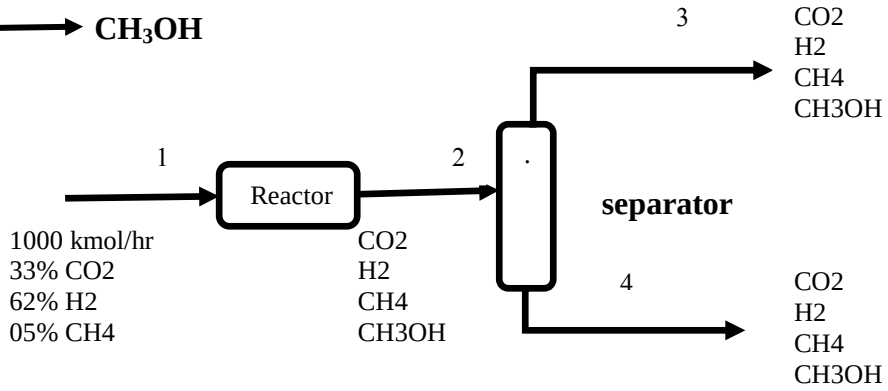
Q1/ / Find the roots of the following equations by solver. **(20 mark)**

$$2X^2 - 5X - 12 = 0$$

Note : $3 <= X_1 <= 5$, $-3 <= X_2 <= 0$

Q2/ Find the amount of CO_2,H_2 and CH_4 in the stream 2 , 3 and 4 , if the conversion of thr reaction is 60% . **(20 mark)**

$2H + CO_2 \longrightarrow CH_3OH$



Additional relations:

1-$(CO_2)2 = 0.4 * (CO_2)1$
2-$(CO_2)4 = 3\% (CO_2)2$
3- $(H_2)4 = 2\% (H_2)2$
4- $(CH_3OH)4 = 96\% (CH_3OH)2$
5-$(CH_4)4 = 4\% (CH_4)2$

Q3/ Find a solution to the following set of equations: **(20 mark)**

$$x + 2y + 3z = 12$$
$$-4x + y + 2z = 13$$
$$9y - 8z = -1$$

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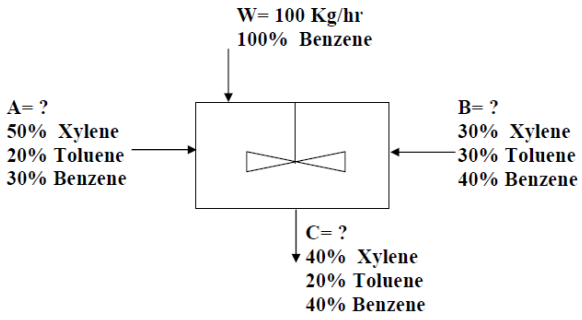
Q4/ a- For the mixer shown below write a code to find the values of streams A, B and C? **(14 mark)**



b- Find the first derivative of the function $(sin(x)/(ln(x^2+1))-e^x$ and evaluate it at x=3. **(8mark)**

(20 mark)

Q5/ Given that the vapor pressure of methyl chloride at 333.15 K is 13.76 bar, write a code to calculate the molar volume of saturated vapor at these conditions using Redlich/Kwong equation Knowing:

$a=0.42748*R2Tc^{2.5}/Pc$

$b=0.08664*RTC/PC$

$V=(RT/P)+b-(a*(V-b))/(T^{.5}\ PV(V+b))$

R=83.14 , Tc= 416.3 k , Pc= 66.8 bar

Good Luck

Exminer : Abdulbasit H. M.

Head of the Dep. *Dr. Aysar T. Jarullah*