Chemical Engineering 201
Fall 2004

Midterm # 3

Name _____

Problem # 1 _____

Problem # 2 _____

Problem # 3 _____

Problem One (60 points):

4.012 g of ammonia mixed with 2.76 moles of nitrogen and 8.28 moles of hydrogen is fed to a mixer where 100 % excess air is added. Assume nitrogen is inert, but that both ammonia and hydrogen are burned. What are the product mole fractions out of the combustor if the fractional conversion for ammonia is 97% and that of hydrogen is 98%?

Problem Two (25 points):

Use gaussian elimination to solve the following system of equations:

$$F_1 + 2F_2 - F_3 = 0$$
$$3F_1 - 7F_2 + 4F_3 = 1$$
$$F_2 + F_3 = 3$$

You must show all work to get credit. You may check your answer with your calculator, but you must show the intermediate steps here.

Problem 3: (15 points)

Short answer

a) what would "=Smithapprox(1,7,9)" do in an Excel spreadsheet related to Visual Basic?

c) Name all of the members from your group for the discussion team projects. Only first names are needed if you are having problems remembering the full names.

Problem 3 (EXTRA CREDIT 10 points):

(3 points) How do you define a varible in Visual Basic so that it will hold more numbers than the default? You may use the variable Number in an example.

(2 points) If you were to see a Visual Basic program that had

```
sum = 0
for I = 1 to 5
   sum = sum + I
next I
```

what would you expect the final result to be?

(2 points) What would you add to the above program to send the result back to your spreadsheet if the function were called Counting?

(3 points) Describe why Gaussian elimination is useful, in your own words.