MIDTERM EXAM IN
CHEM 121
(CHEMISTRY FOR ENGINEERS)

Test I: What is the oxidation number of nitrogen in each of the following (2 points each)

a. $\underline{N}H_4ClO_2$

$N + 4(1) + (-1) + 2(-2) = 0$

$N + 4 - 1 + 4 = 0$

$N - 1 = 0$

N = 1

b. $H\underline{N}O_3$

$1 + N + 3(-2) = 0$

$1 + N - 6 = 0$

$N - 5 = 0$

N = 5

c. $\underline{N}_2O_5$

$2N + 5(-2) = 0$

$2N - 10 = 0$

$2N = 10$

N = 5

d. $(\underline{N}H_2)_2CO$

$2N + 4(1) + 2 + (-2) = 0$

$2N + 4 + 2 - 2 = 0$

$2N = -4$

N = -2

e. $K_3\underline{N}$

$3(1) + N = 0$

$3 + N = 0$

N = -3

f. Nitrogen Tetra Oxide (N_2O_4)

$2N + 4(-2) = 0$

$2N - 8 = 0$

$2N = 8$

N = 4

g. Anmonium Thiosulfate $(NH_4)_2S_2O_3$

$2N + 4(1) + 2(-2) + 3(-2) = 0$

$2N + 4 - 4 - 6 = 0$

$2N = 6$

N = 3

h. Ammonia (NH_3)

$N + 3(1) = 0$

$N + 3 = 0$

N = -3

i. Ammonium Borate ($BH_{12}N_3O_3$)

$3 + 12(1) + 3N + 3(-2) = 0$

$15 + 3N - 6 = 0$

$9 + 3N = 0$

$3N = -9$

N = -3

j. Nitrous Acid (HNO_2)

$1 + N + 2(-2) = 0$

$1 + N - 4 = 0$

$N - 3 = 0$

N = 3

Test II: Fill in the blanks with formula of compounds composed of the indicated positive and negative ions. (30 points)