1. Determine the amount of manure needed (in lbs) to supply 240 lb N/ac (total over 4 years) on a plot that measures 100’ by 17.5’.  The manure has an N concentration of 1.6 % and a moisture content of 16%.

Plot area = 1750ft2  
When we determine %N on manure (LECO), it is done on “dry material”   
240/0.016 = 15,000 lbs wet material  
Not all of this is 1.6%N. Only 84% of it is 1.6%N  
SO: 15000 lbs wet material would only deliver 201 lbs N/ac (240\*0.84)  
15,000/0.84 = 17857 lbs wet material needed/ac  
17857/43560 = x/1750  
X=717 lbs on 1750 square feet

2.  For #1 above, how much manure would be needed if the mineralization rate was expected to be 46%?

 The mineralization rate of the manure cannot dictate how much total N should be applied. This is a characteristic of the material.

3. Determine the rates of N as urea and P as 18-46-0 to supply a total of 100 lbs N/ac and 20 lbs P/ac.  Also express these values in kg/ha.

100/0.18 = 555 lbs DAP/ac for 100 lb N/ac. Or 621 kg DAP/ha  
555\*0.46 = 255 lbs P2O5/ac = 111.4 lbs P/ac = 124.7 kg P/ha  
  
Solution:

More P is being applied than needed using 18-46-0 as the N source. Need to use urea as the N source, and account for carrier N in 18-46-0.  
20 lbs P/ac (/0.436) = 45.8 lbs P2O5/ac. 45.8/0.46 = 99.56 lbs DAP/ac (has 17.9 carrier lbs of N/ac)  
apply 82.1 lbs N/ac : as urea = 178.4 lbs /ac

4. Determine how much ammonium sulfate would be needed to supply 150 lbs N/ac.  This plot also needs 100 lbs of S/ac.   How much added S as elemental sulfur will be needed?

(NH4)2SO4 has 24%S , and 21%N  
150/0.21 = 714 lbs AS to deliver 150 lbs N/ac  
Carrier S = (714\*0.24) = 171 lbs S/ac if 714 lbs AS applied.  
NO added S as elemental S is needed

5. You need 4 lbs Zn/ac as zinc sulfate.  How much is needed on a plot that measures 20x100’.  On what kind of soil would you expect that this is needed?

 ZnSO4 has 36% Zn.   
4/0.36 = 11.1 lbs ZnSO4/ac.  
11.1/43560 = x/2000  
x = 0.509 lbs material/2000 square feet

Calcareous and low organic matter soils are those where you find Zn deficiencies. High pH by itself isn’t enough to justify applying Zn.