Unit 5 – Populations and Samples
Self Evaluation Quiz

1. Consider the following **population** comprised of N=5 individuals. The variable measured is the grams of dietary fat consumed in a 24 hour period as determined via a food diary:

PERSON	FAT(g)
1	130
2	192
3	201
4	185
5	212

a. Compute the following **population** parameters (***Note*** - I am asking for values of *population* parameters, **not** values of sample statistics such as $\bar{X}$ or S^2. Thus, in the calculation of σ^2, the division will be by the population size (N) and not by (n-1) which is the divisor in the calculation of the sample variance S^2- cb):

i) mean, μ
ii) variance, σ^2
iii) standard deviation, σ
iv) median

b. If we sample **with replacement** and choose samples of size n=2 from this population, how many possible samples are there?

c. Write down the observations in each of these samples. Compute for each sample of size n=2: (***Note*** – Now I ***am*** asking for values of sample statistics such as $\bar{X}$ or S^2.- cb):

i) Mean, $\bar{X}$
ii) Variance, S^2
iii) standard deviation, S
iv) median

d. Compute the ***sampling distribution*** mean of each of the four sampling distributions in (c) and compare these with the population parameters in (a). ***Note*** - This exercise asks you to compute the mean of the collection of means you got in (c), the mean of the collection of variances you got in (c), etc. - cb

e. Based upon (d), which statistics are unbiased estimates of their respective parameters, and which are biased?

f. Compute the variance of the sampling distribution of the sample mean and compare it to the variance of the original population of 5 observations.