**QUIZ Exp & Log - Equations**

1. Solve the following equations :

a) $log(x+3)+log x=1$ [3]

b $ln(x+6)-ln(x+2)=lnx$ [3]

c) $27^{x^{2}+1}=81^{x+1}$ [2]

b) $2^{x}=3^{10}$ [2]

c) $25^{x-3}=50^{x+1}$ [3]
2. The population of a particular insect is divided by 2 each night when the temperature drops below 0oC. [3]
a) Determine an exponential function that models the proportion of population, *P*, left after *n* nights when the temperature was below 0oC.

b) Which percentage of the population, to the nearest hundredth, remains after 5 nights when the temperature was below 0oC ?

c) Will the population be zero one day? Explain.
3. One dollar is invested at a 4.5% interest rate compounded quarterly. What is the value of the investment after 5 years? [2]
4. Iodine-131 is a radioactive substance. Assume that you have a 250g sample at the start, and that after 32 days, only 15.625g remain. What is the half-life of Iodine-131? [3]
5. The population of a city decreases by 2% each year. The current population is 11 568. What will it be in 10 years? [2]
6. The sound level, *L*, in decibels, is given by $L=10log\left(\frac{I}{I\_{0}}\right)$, where *I* is the intensity of the sound and $I\_{0}$ is the minimum intensity that can be detected by our ears. [3]
a) Determine the sound level of a sound that is 20 times more intense than $I\_{0}$, to the nearest decibel.

b) The sound level of a bedroom at night is 30 dB, whereas the sound level of a normal conversation is 60 dB. How much more intense is the normal conversation compared to a bedroom at night?