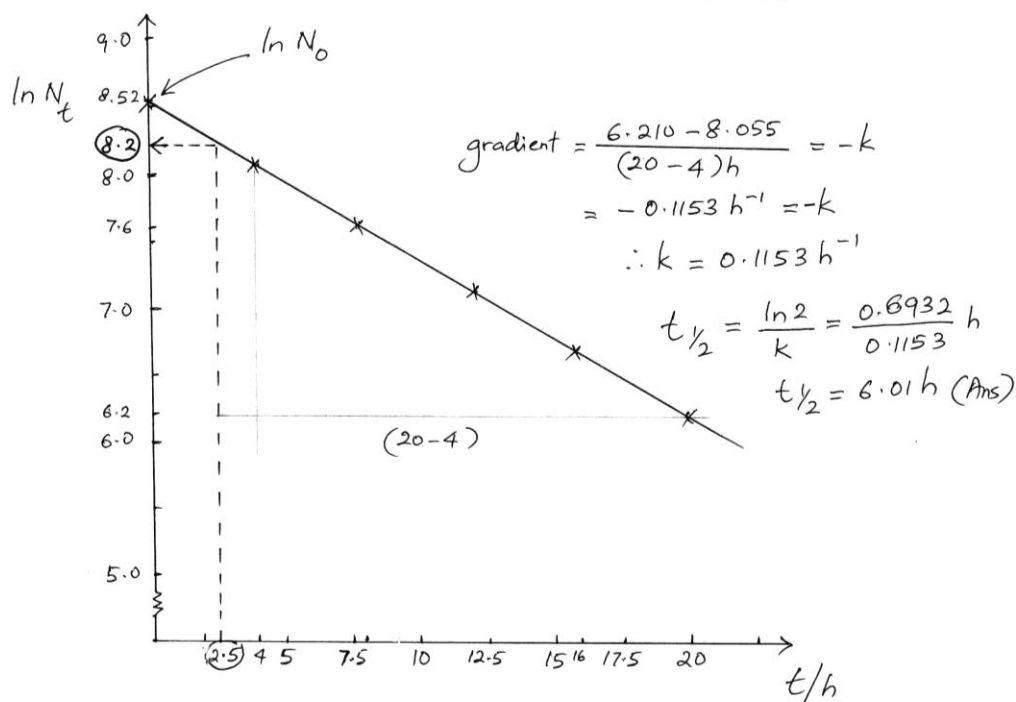


Sem 1 (2010/2011) : Nuclear Reaction

Q3 (a)  $\ln\left(\frac{N_0}{N_t}\right) = kt$   
 $\ln N_t = -kt + \ln N_0$  ← similar to:  $y = mx + c$   
 (linear equation)

Plot  $\ln N_t$  Vs.  $t$

time, $t$ (h)	$N_t$ (photons $s^{-1}$ )	$\ln N_t$
0	5000	8.517
4	3150	8.055
8	2000	7.600
12	1250	7.130
16	788	6.670
20	495	6.210



$\therefore$  (i) half-life of  $^{99m}\text{Tc} = 6.01 h \text{ (Ans)}$