1. How long will it take until the thermal radiation from a 1 MT bomb explosion will reach a house 6 miles from the explosion site? How long will it take the shock front to cover the same distance? (take as the speed of sound \( c_s = 330 \text{ m/s} \) and as speed of light \( c = 300,000,000 \text{ m/s} \))

2. Coal contains approximately 1\( \mu \text{g} \) of U and 5\( \mu \text{g} \) of Th per 1g of coal. Calculate the activity of one ton of coal considering that the half-life of 238U is \( T_{1/2} = 4.6 \times 10^9 \text{y} \) and the half-life of 232Th is \( T_{1/2} = 1.4 \times 10^{10} \text{y} \).

3. Consider 5 MeV gamma radiation are being fully absorbed in your body of 70kg mass. Calculate the dose you have received. Give the dose in units Gray and Rad.

4. Calculate how much more annual dose the student at the University of Colorado at Boulder receives compared to the annual dose of a domer!

5. Describe the difference in origin of the primary and the secondary gamma burst in a bomb explosion

6. Calculate according to the rule of seven the activity of the fall-out of a nuclear bomb after 3 months when the initial release corresponded to an activity of 10 MegaCi

7. What is the lethal radiation dose of a human being? Calculate how much \(^{40}\text{K}\) one must have in his body to accumulate a lethal dose in a lifetime of 80 years (assume a body mass of 80 kg).