

Name _____

1. a) What is meant by *background radiation*? Give two examples of natural background radiation sources.

b) A survey meter in our lab measures an exposure rate of 0.02 mrem/hour due to background sources. Assuming this rate remains constant, to what exposure does this correspond over one entire year? Show your calculation.

2. a) A survey meter at 1 m distance from an unshielded ^{137}Cs source of 5 μCi activity shows a rate of exposure of 0.1 mrem/hour due to γ -rays emitted from this isotope. Calculate your total exposure that you would receive if you remained at a distance of 1 m from this source for 2 hours. What fraction of the annual exposure of 170 mrem above background allowed by the EPA for the general population does this correspond to?

b) What strategies would you follow to reduce your exposure from this source during the 2 hours you are in the lab working with this source?

3. a) Name three ways in which ionizing radiation may alter the function of a living cell.

b) Which of these causes you the greatest concern?

4. Does potentially receiving a total exposure of 0.2 to 0.5 mrem from working with radioactive sources in the physics laboratory constitute an unacceptable health hazard to you? Explain your answer.