**HONORS HOMEWORK 6.1B – HALF-LIVES AND USES OF RADIATION**

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| (a) | A medical engineer is working on a radiotherapy treatment for thyroid cancer. | |
| (i) | One treatment he is considering involves injecting some radioactive iodine into the patient’s bloodstream.  Explain briefly how this treatment is likely to work, what type of radiation the iodine should emit and whether the half-life should be long or short. |
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| (ii) | Another treatment he is considering involves firing radiation at the tumor from outside the body.  Explain briefly how this treatment is likely to work, what type of radiation he would need and whether the half-life should be long or short. |
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| (b) | A paper factory is developing a technique for using radioactive material to monitor the thickness of the paper being produced.  Suggest how the technique might work.  Indicate what type of radiation should be used and whether the radioactive material should have a long or short half-life. |
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| (c) | The half-life of carbon-14 is 5730 years. |
| If a fossil is approximately 23,000 years old, approximately what percentage of its carbon-14 should still be present? |
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| Bruno has discovered a skeleton which he thinks might be the remains of Jesus. She carbon-dates the skeleton and finds that 78.6% of its carbon-14 is present.  Has Bruno discovered Jesus? |
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