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| 10  Marks Total | ASSIGNMENT 20  **Unit D Assessment**  This assignment has **one** question and is worth 10 marks. Note: The answer areas will expand to fit the length of your response. Important: Complete this assignment after you have reviewed your marked Assignment 19. |

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| **1.** | Isotopes can be separated using a mass spectrometer. The mass spectrometer will typically ionize a neutral sample by heating. These ions will then be accelerated through an electric field and then they would enter a magnetic field where they would travel in a circular path. The radius of the path would depend on the mass of the particle and different isotopes in a sample could be identified by their masses. |
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| (1) | 1. A singly charged lithium ion is accelerated from rest through a potential difference of 4.00 x 104 V. This ion then enters a perpendicular magnetic field with a strength of 0.700 T. Indicate the force(s) acting on the electron in the diagram below.   Heater  -  +  Electric field  Magnetic field |
| (4) | 1. If the radius of the deflected ion is 0.109 m, what is the mass of the particle? |
| Answer: |  |
| (4) | 1. State which physics principles were used to solve for the mass of the particle and why you chose those principles. |
| Answer: |  |
| (1) | 1. Determine which isotope of Lithium the ion is. (Hint: determine the atomic mass number) |
| Answer: |  |

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| When you have completed the question in this assignment, submit your work. |