2002 HIGHER SCHOOL CERTIFICATE EXAMINATION

Chemistry

Section I – Part B (continued)

Marks

Question 19 (5 marks)

(a) Describe the conditions under which a nucleus is unstable. **2**

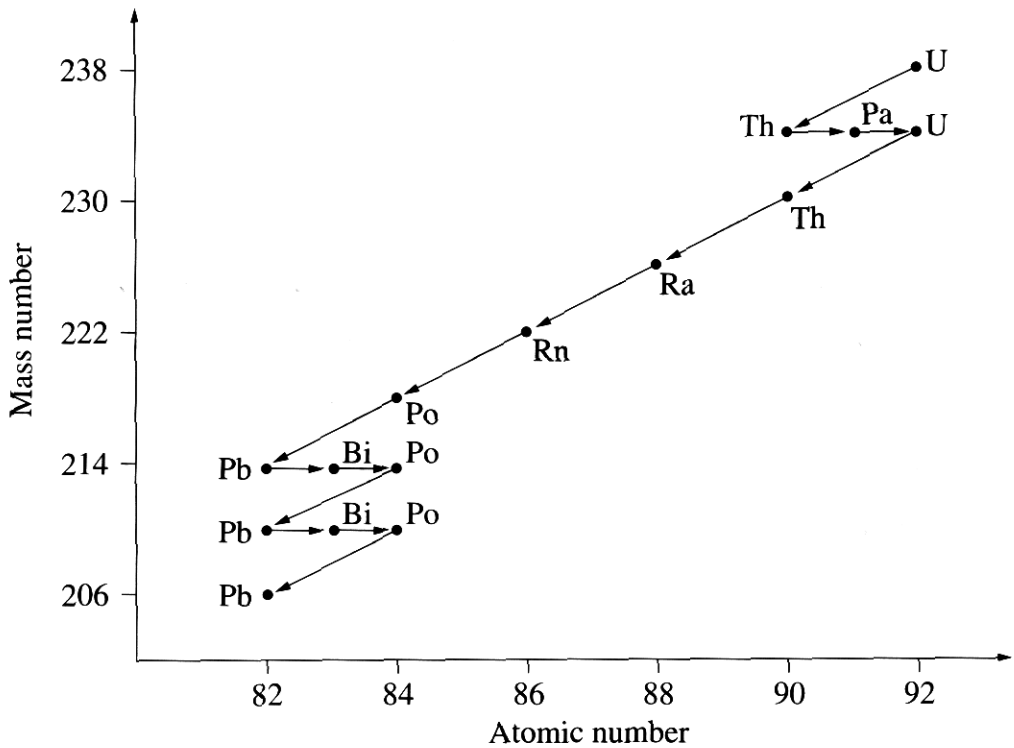
A nucleus is unstable when it has an atomic number greater than 83, it's proton and neutron ratio is unstable and if it lies outside the zone of stability

Question 19 continues on page 14

Marks

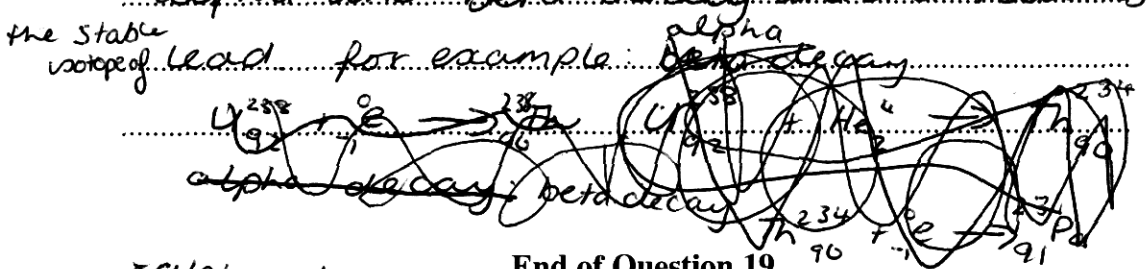
Question 19 (continued)

(b) The following is a flow diagram showing the sequence of products released during the decay of uranium. **3**



Use examples from the flow diagram to describe processes by which an unstable isotope undergoes radioactive decay.

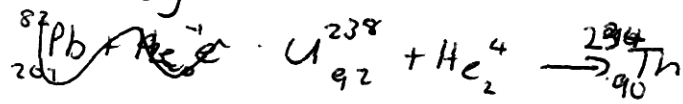
...in the example of uranium it undergoes ...alpha and beta decay until it reaches the stable isotope of lead for example: alpha decay ...



alpha decay; beta decay

End of Question 19

× alpha decay



× beta decay $Th^{234}_{90} + \overset{0}{e}_{-1} \rightarrow {}^{234}_{91}Pa$