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**

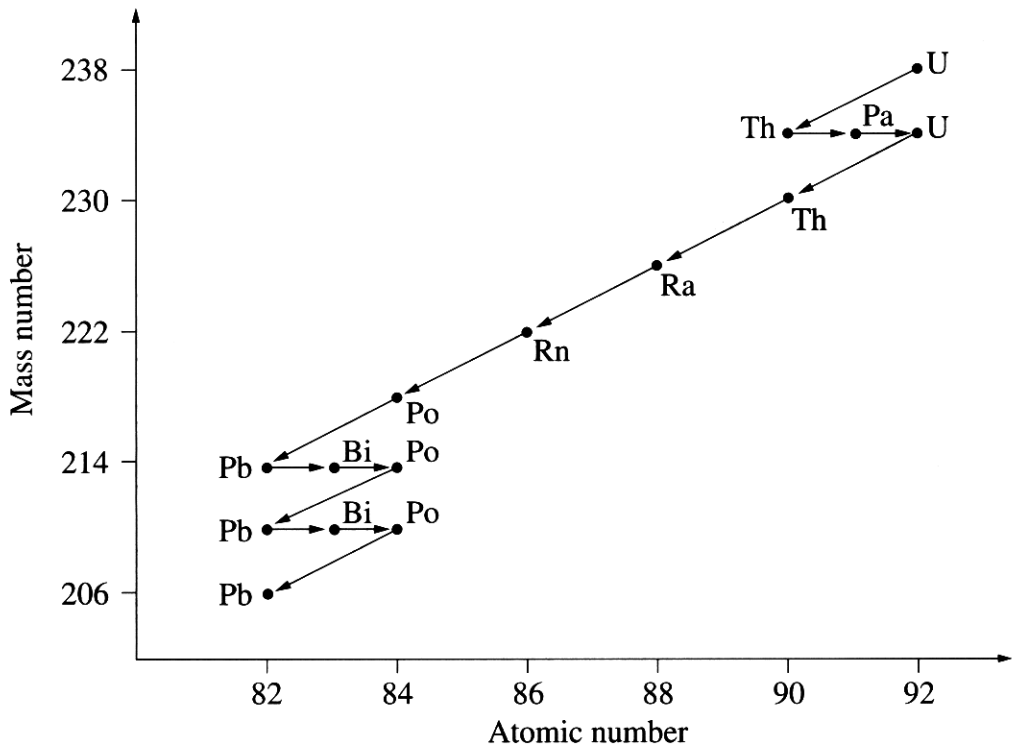
A neucleaus is unstable when the ratio of neutrons to protons is not correct. If there are more neutrons than protons, and the neucleaus is also unstable if the neucleaus is too heavy. Thus too many protons and neutrons. Thus they have to loss mass and the neucleaus is unstable as it releases protons + neutrons.

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.

An unstable isotope undergoes Alpha decay when the nucleaus is too heavy. eg. $^{238}_{92}U \rightarrow ^{234}_{90}Th + ^{4}_{2}He$ to loose mass
and beta e^{0}_{-1} decay when the ratio of protons to neutrons are wrong eg. $^{234}_{90}Th \rightarrow ^{234}_{91}Pa + e^{0}_{-1}$ to increase protons. in ratio to neutrons

End of Question 19