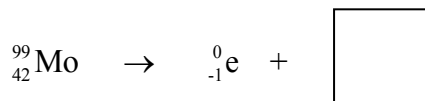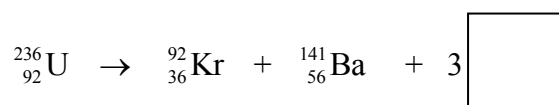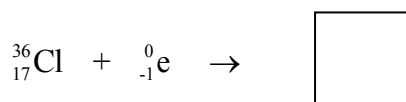**Marks**

- Balance the following nuclear reactions by identifying the missing nuclear particle or nuclide.

3

$$^{36}_{17}Cl \;+\; ^{0}_{-1}e \;\rightarrow\; \boxed{}$$

$$^{236}_{92}U \;\rightarrow\; ^{92}_{36}Kr \;+\; ^{141}_{56}Ba \;+\; 3\boxed{}$$

$$^{99}_{42}Mo \;\rightarrow\; ^{0}_{-1}e \;+\; \boxed{}$$

- The half-life of plutonium-239 is 24110 years. How many years (to the nearest year) must pass after $^{239}_{94}Pu$ is produced for the number of $^{239}_{94}Pu$ atoms to decay to 0.01000 of the original number?

3

Answer:

- Provide a brief explanation of the process by which nuclear radiation causes biological damage.

2