1. Explain **two** safety precautions that should be used when handling gamma radiation.

2. Outline how our understanding of atomic structure has developed s Rutherford's model.

3. An experiment is carried out to investigate how the intensity of rad fr[illegible]e [illegible]. State what should be plotted on a graph to verify

4. Explain why the importance of correcting for background radiation in an experiment is higher.

5. A student investigated the variation of activity with time for a lab radioactive source. The results are shown in the table.

t / s	A / s^{-1}
0	204
60	105
120	68.9
180	35.5
[illegible]	21.8
300	13.8
360	6.96
420	4.56

(a) the results in the table to generate a set of derived results straight-line graph.
(b) Plot the graph from your derived results and complete it with
(c) Determine the gradient from your graph. Show your working
(d) Use your gradient to determine the decay constant for protactin

6. The half-life of cobalt-60 is 1.93×10^3 days. Calculate the number sample of cobalt-60 to decay to 77 % of its original activity.

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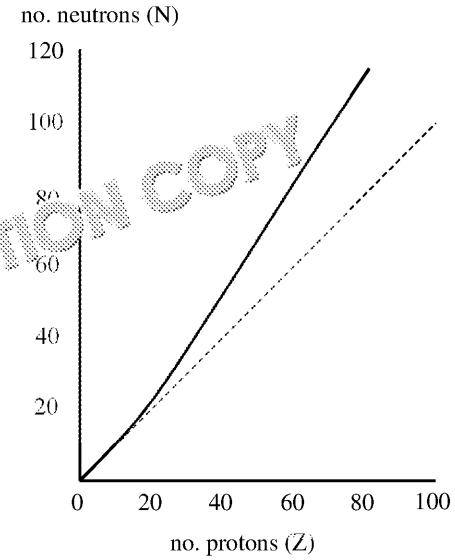
7. The graph shows the variation in neutron number with proton numbe
One particular nuclide, E, is represented by a dot on the graph.



This nuclide decays by emission of:

- one beta plus particle to form nuclide F
- one alpha particle to form nuclide G
- one electron capture to form nuclide H

Show this decay series on a graph of N against Z. You do **not** need graph printed here.

8. In an experiment to deter[illegible]th [illegible]uclear radius of $^{197}_{79}Au$ alpha pa
Calculate the for[illegible]e on an alpha particle when it is 350 fm a
ato[illegible] $^{197}_{79}$[illegible]. Assume there are no other forces from any other p

9. The equation shows a nuclear fusion reaction and the masses, in ato
reactants and products.

$$^{2}_{1}H \quad + \quad ^{3}_{1}H \rightarrow \quad ^{4}_{2}He \quad + \quad ^{1}_{0}n$$

$$2.013553 + 3.016049 \qquad 4.001506 + 1.008665$$

Calculate the energy released when 2 moles of hydrogen-2 undergo
hydrogen-3 in this way.

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Preview of Questions Ends Here

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