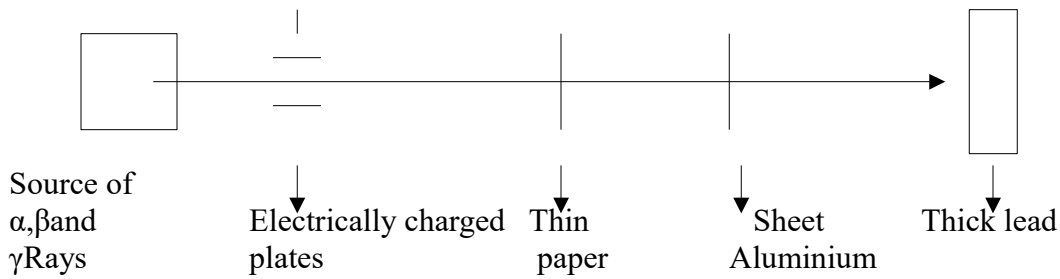


NAME	INDEX NUMBER
SCHOOL	DATE _____

RADIOACTIVITY

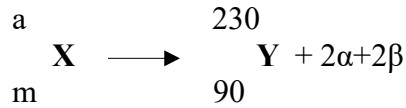
1. 1989 Q 16

Complete the diagram below to show how the particles and rays are reflected and at which material each of them is stopped. (2 marks)



2. 1990 P1A Q 2

What are the values of m and a in the nuclear equation given below? (2 Marks)



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3. 1991 P1A Q13

Write mass number and atomic number of the isotope formed when it undergoes radioactive decay by emitting a particle.

Mass number: (1 mark)

.....

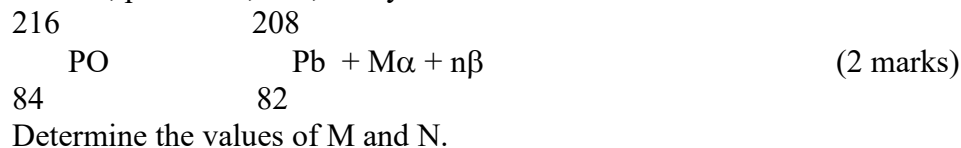
.....

Atomic number (1 mark)

.....
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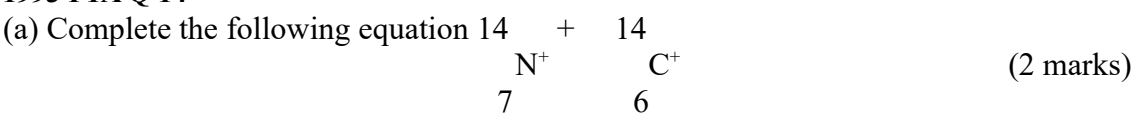
4. **1992 P1A Q17**

Radioactive, polonium, 216, decays as shown below:-



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5. **1993 P1A Q 14**



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(b) Give one use of radioactive elements (1 mark)

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6. **1993 Q P1A 7**

The Table below gives the rate of decay for radioactive element Y.

Number of days	Mass (g)
0	384
270	48

Calculate the half-life of the radioactive element Y.

.....
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.....

7. **1995 P1A Q30**

(a) 100g of radioactive ${}_{91}^{233}\text{Pa}$ was reduced to 12.5g after 81 days.



Determine the half-life of Pa. (2 marks).

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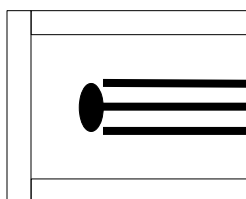
b) ${}_{91}^{233}\text{Pa}$ decays by Beta emission. What is the mass number and the atomic

number of the element formed? (1 mark)

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8. **1996 P1A Q 20**

Complete the diagram below to show how α and β particles from radioactive can be distinguished from each other. Label your diagram clearly. (3 marks)



Source of radiation

Paper

Metal foil

9. 1997 P1A Q 7

M grammes of a radioactive isotope decayed to 5 grammes in 100 days.
 The half-life of the isotope is 25 days.

(a) What is meant by half-life? (1 mark)

.....

 ..

(b) Calculate the initial mass M of the radioactive isotope. (2 marks)

.....

10. 1998 P1A Q1

An isotope of Uranium $^{234}_{94}\text{U}$, decays by emission of an alpha particle to thorium. Th.



(a). Write the equation for the nuclear reaction undergone by the isotope. (1 mark)

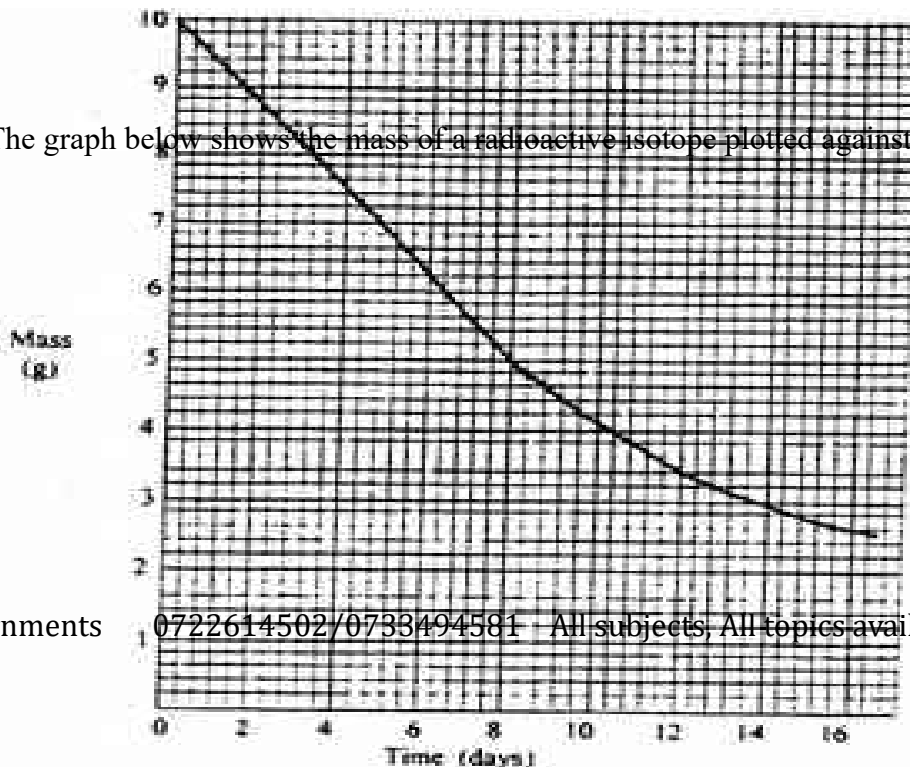
.....
 .

(b). Explain why it is not safe to store radioactive substances in containers made from Aluminum sheets. (1 mark)

.....

11 1999 Q 26

The graph below shows the mass of a radioactive isotope plotted against time



(a) Using the graph, determine the half – life of the isotope

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.....
.....
.....

(b) Calculate the mass of the isotope present after 32 days

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12. 2000 Q 13

A radioactive isotope X_2 decays by emitting two alpha (α) particles and one beta (β) to form ${}_{83}^{214}\text{Bi}$



(a) What is the atomic number of X_2 ?

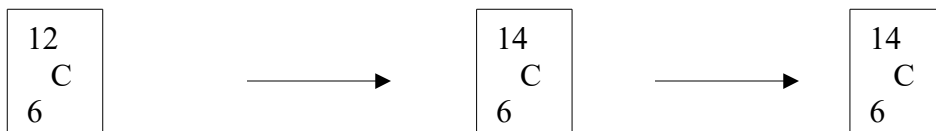
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(b) After 112 days, $\frac{1}{16}$ of the mass of X_2 remained. Determine the half life of X_2

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13. 2001 Q 1

Study the nuclear reaction given below and answer the questions that follow.



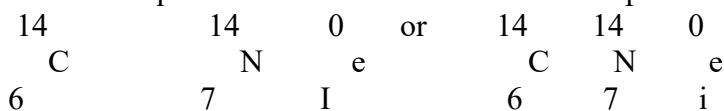
(a) 12 and 14 are isotopes. What does the term isotopes mean? What does the term isotope mean?



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(b) Write an equation for the nuclear reaction in step II



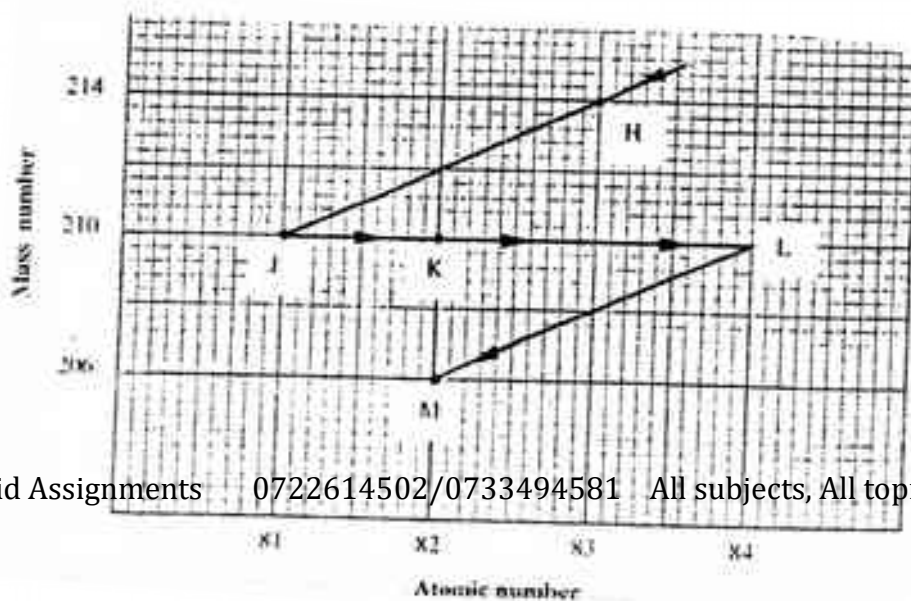
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(c) Give one use of $\begin{array}{c} 14 \\ \text{C} \\ 6 \end{array}$

.....
 .

13. 2002 Q 10

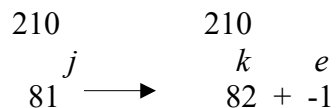
The graph below represents a radioactive decay series for isotope H. Study it and answer the questions that follow



(a) Name the type of radiation emitted when isotope H changes to isotope J.

.....

(b) Write an equation for the nuclear reaction that occur when isotope J changes to isotope K



.....

.

c) Identify a pair of isotope of an element in the decay series

.....

.....

..

14. 2005 Q 14

100 g of a radioactive substance was reduced to 12.5 g in 15.6 years.
Calculate the half – life of the substance.

(2

marks)

.....

.....

.....

...

15. 2006 Q 4

(a) Complete the nuclear equation below.

(1

mark)



.....

 ..

- (b) State one:
 (i) Use of radioisotopes in agriculture
 (1 mark)

.....
 (ii) Danger associated with exposure of human beings to radioisotopes
 (1 mark)

.....

17. 2007 Q 14

- a) Distinguish between nuclear fission and nuclear fusion. (2 marks)

.....

- b) Describe how solid wastes containing radioactive substances should be disposed of.
 (1 mark)

.....

18. 2008 Q 24

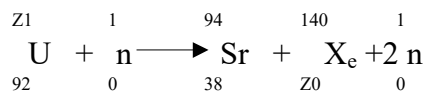
- a) A radioactive substance emits three different particles. Give the symbol of the particle

with the highest mass.

(1 mark)

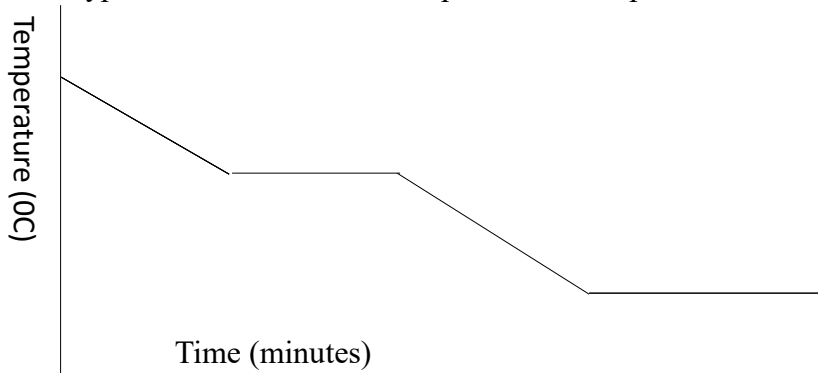
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 .

b) (i) Find the values of Z_1 and Z_2 in the nuclear equation below



ii) What type of nuclear reaction is represented in b (i) above?

(1 mark)



Give the name of the:

a) Process taking place between t_0 and t_1 .

(1 mark)

.....
 .

b) Energy change that occurs between t_3 and t_4

.....

19. 2009 Q 6d P2

(d) Naturally occurring uranium consist of three isotopes which are radioactive.

Isotopes	234 u	235u	238u
Abundance	0.01%	0.72%	99.27%

(i) Which of these isotopes has the longest half-life? Give reasons.

(1

mark)

.....

 ..

(ii) Calculate the relative atomic mass of uranium.

(2

marks)

.....

.....

(iii) ${}_{92}^{235}\text{U}$ is an alpha emitter .If the product of the decay of this nuclide is thorium (Th) .Write a nuclear equation for the process. (1

mark)

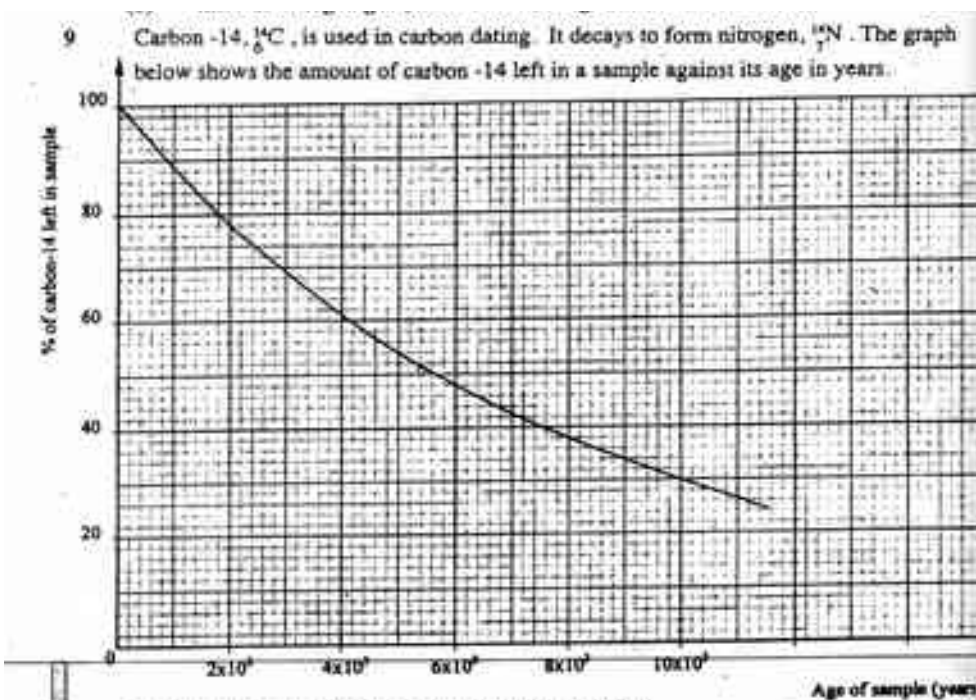
.....
 iv) State one use of radioactive isotopes in the paper industry (2

marks)

.....

20. 2010 Q 9

Carbon -14, ${}^{14}_6\text{C}$, is used in carbon dating. It decays to form nitrogen, ${}^{14}_7\text{N}$. The graph below shows the amount of carbon -14 left in a sample against its age in years.



a) Write a nuclear equation for the decay process of carbon -14. (1 mark)

.....
 b) From the graph, determine the;

i) Half-life of carbon -14; (1 mark)

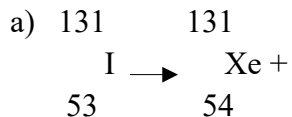
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ii) Percentage of carbon -14 in a sample whose age is 1950 years. (1 mark)

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21. 2011 Q 2

Complete the nuclear equation below:



b) The half life of ${}_{53}^{131}\text{I}$ is 8 days.

Determine the mass of ${}_{53}^{131}\text{I}$ remaining if 50 grammes decayed for 40 days.

.....
.....
.....

c) Give one harmful effect of radioisotopes. (1 mark)

.....

22. 2012 Q9 P1

120g of iodine – 131 has a half life of 8 days decays for 32 days. On the grid provided, plot a graph of the mass of iodine – 131 against time. (3 marks)