Name of the Student:_____
Max. Marks : 23 Marks **Time : 23 Minutes**

Mark Schemes

Q1.

(a) **C**

1

(b) beta

accept gamma
if answer alpha can still gain marks for saying why not beta or gamma

1

any **two** from:

*must have at least one quantitative statement to get **2** marks*

- range in air for beta is (at least) 50cm
- count-rate does not drop (much) in first 40cm
- count-rate does not fall much until distance is 60cm
- alphas cannot travel more than 5cm in air / alphas could not travel 100cm in air

  accept alphas cannot travel that far
- alphas would not be detected
- gammas not absorbed by 100cm of air

  accept gammas not stopped by air
  accept gammas travel further than alphas and betas
  strength of source is neutral
  references to penetrating power is neutral

2

(c) (i) increases

1

(ii) Group **A** think that (even a very small level of exposure) gives some risk

accept there is always a risk, no matter how small the level of exposure

1

Group **B** think that there is no risk (from a very low level of exposure)

accept below a certain level of exposure there is no risk
no marks for a simple graph description

1

[7]

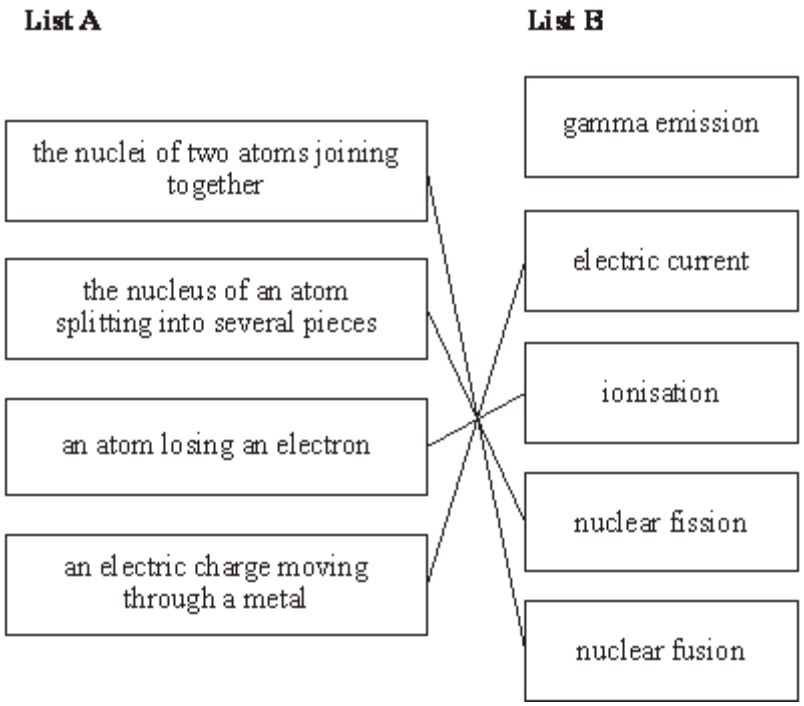
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Q2.

four lines correct

*allow **1** mark for each correct line*

if more than 1 line is drawn from a box in List A, mark each line incorrect



[4]

Q3.

(a) (i) half / ½ / 50%

accept 1 (part) in 2 (parts) 1

1

(ii) (the) food (we eat) is radioactive

accept because of the food (we eat)

accept we breathe in radon

radon in the air is neutral

1

(b) higher in village B

1

by 6 units

allow 1 mark for correctly obtaining a height difference of 180(m)/ 4 times higher – this refers to height and not radiation levels

accept for 3 marks in village A it is 2 units (extra) and in village be it is 8 units (extra)

allow 1 mark for a correct radiation calculation based on incorrect height readings

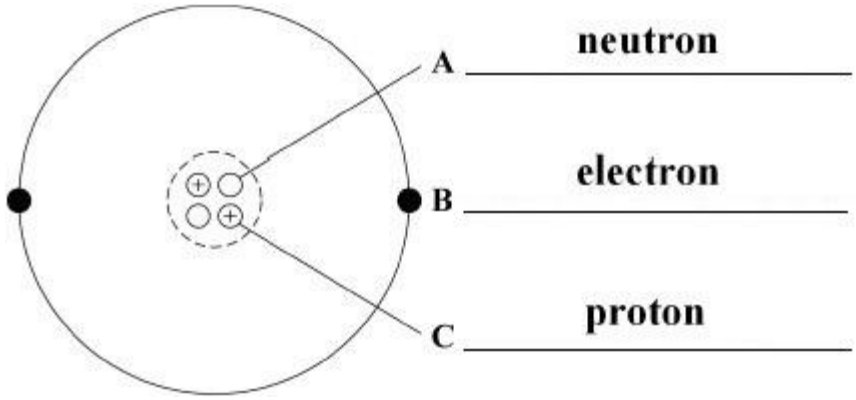
2

[5]

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Q4.

(a) (i)



all 3 labels correct

*allow **1** mark for 1 correct label*

2

(ii) has no electrons

it = alpha

allow alpha has a positive(charge)
allow a helium (atom) has no (charge)

*do **not** accept general properties of alpha*
*do **not** accept general answers in terms of size / density / mass etc*

1

(b) (i) 15 (hours)

accept any answer between 14.8 and 15.2 inclusive

1

(ii) 15 (hours) or their (b) (i)

1

(c) (i) americium-241 has a long half life

1

(ii) any **one** from:

- alpha (particles) are harmful to …

  accept radiation / radioactive material is harmful to …
  accept specific example of harm
  eg can cause cancer
  accept radiation is poisonous if ingested / inhaled

  *do **not** accept it is poisonous / in case of leakage*

- so they dispose of it safely / appropriately

- so they don't break it open / open it

  *accept do **not** touch the radioactive source*

- so they can make a choice about having a radioactive source (in the house)

  it = radioactive material

1

[7]

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