Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Mark Schemes

Q1.

(a) nuclei

do not accept atoms

1

decreases

1

(b) m = 0.004 (kg)

1

E = 0.004 × 5200 × 50 000 000

allow a correct substitution of an incorrectly/not converted value of m

1

E = 1.04×10^9 (J)
or
E = 1 040 000 000 (J)

allow a correct calculation using an incorrectly/not converted value of m

1

(c) any **two** from:

- to make sure the fusion process is possible
- to develop an understanding of the process
- to make adaptations to the process
- to assess the efficiency of the process
- to make predictions
- assess safety risks
- to assess environmental impact
- set-up cost is lower (for small scale experiments)

2

(d) releases carbon dioxide

allow releases greenhouse gases

1

which causes global warming

allow which causes climate change

OR
releases particulates
which causes global dimming
or

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which cause breathing problems

OR
releases sulfur dioxide
which cause acid rain

OR
releases nitrogen oxides
which cause breathing problems
or
which causes acid rain

1

[9]

Q2.

(a) $\text{count rate} = \frac{819}{60}$

1

count rate = 13.65

1

corrected count rate = 13.35 (per second)

allow an answer of
background = 0.30 × 60
= 18 (per minute)
corrected count rate
= 819 – 18
corrected count rate
= 801 per minute

1

*an answer of 13.35 (per second) scores **3** marks*
*an answer of 13.95 (per second) scores **2** marks*
*an answer of 801 (per second) scores **2** marks*

(b) activity = 1250 × 180

1

activity = 225 000 (Bq)

1

*an answer of 225 000 (Bq) scores **2** marks*

(c) yearly dose = 0.003 × 365

allow yearly dose = 1.095 (mSv)

1

which is << 100 (mSv)
or
(well) below the lowest dose with evidence of causing cancer / harm

1

(d) people are able to compare a radiation risk / dose / hazard to the radiation dose from (eating) bananas

1

[8]

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