

Name of the Student: _____

Max. Marks : 17 Marks

Time : 17 Minutes

Mark Schemes

Q1.

- (a) (i) splitting of a(n atomic) nucleus
do not accept splitting an atom 1
- (ii) Neutron 1
- (b) (i) nuclei have the same charge
or
nuclei are positive
accept protons have the same charge 1
- (ii) (main sequence) star
accept Sun or any correctly named star
accept red (super) giant 1
- (c) (i) any **two** from:
 - easy to obtain / extract
 - available in (very) large amounts
 - releases more energy (per kg)*do not accept figures only*
 - produces little / no radioactive waste.*naturally occurring is insufficient*
seawater is renewable is insufficient
less cost is insufficient 2
- (ii) any **one** from:
 - makes another source of energy available
 - increases supply of electricity
 - able to meet global demand
 - less environmental damage
 - reduces amount of other fuels used.*accept any sensible suggestion*
accept a specific example
accept a specific example 1
- (d) 12
allow 1 mark for obtaining 3 half-lives 2

Q2.

- (a)

(i)

plutonium (239)
accept Pu / Thorium / MOX (mixed oxide)
*do **not** accept uranium-238 **or** hydrogen*

1
- (ii)

(energy) used to heat water and

produce (high pressure) steam

the steam drives a turbine (which turns a generator)

1
1
1
- (b)

Neutron(s) shown ‘hitting’ other U-235 nuclei
one uranium nucleus is sufficient

U-235 nuclei (splitting) producing 2 or more neutrons

1
1
- (c)

any **two** from:
 - neutrons are absorbed (by boron / control rods)
 - there are fewer neutrons
 - chain reaction slows down / stops
accept fewer reactions occur

2