Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 6_Radioactivity

Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks :18 Marks **Time : 18 Minutes**

Q1.

Explain the use of a moderator in a nuclear reactor.

(3)

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

(Total for question = 3 marks)

Downloaded from www.merit-minds.com

Q2.

Carbon–14 decays into nitrogen–14.

The symbol for nitrogen–14 is $^{14}_{7}N$

Explain what happens in a carbon-14 nucleus when it decays to a nitrogen-14 nucleus.

(2)

.....

.....

.....

.....

(Total for question = 2 marks)

Downloaded from www.merit-minds.com

Q3.

Ultraviolet (UV) waves from the Sun travel towards the Earth.

Ultraviolet waves can be grouped by wavelength.

The three groups of wavelengths are UVA, UVB and UVC.

Figure 7 shows, for each group,

- the wavelength range
- the effect of the Earth's atmosphere on each type of UV wave.

	UVA	UVB	UVC
wavelength range	400 nm to 315 nm	314 nm to 280 nm	279 nm to 100 nm
% energy absorbed by the Earth's atmosphere	5%	95%	100%

Figure 7

UV radiation of wavelength 365 nm is used to detect forged banknotes.

In a genuine banknote there are marks that **cannot** be seen using visible light.

These marks **can** be seen using UV radiation.

Explain why the marks can be seen when the UV radiation shines on the banknote.

Your answer should refer to the energy of electrons in atoms.

You may draw a diagram to help with your answer.

(4)

.....

.....

.....

.....

.....

.....

.....

.....

(Total for question = 4 marks)

Downloaded from www.merit-minds.com

Q4.

Nuclear fusion is another type of nuclear reaction.

Explain why there are no power stations using nuclear fusion.

(3)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for question = 3 marks)

Downloaded from www.merit-minds.com

Q5.

Fusion and fission are nuclear reactions in which large amounts of energy are released.

(i) In a fusion reaction, two hydrogen nuclei are forced together to form a helium nucleus.

Explain why a very high temperature is needed for this reaction to happen.

(3)

.....

.....

.....

.....

.....

.....

(ii) In a fusion reaction, the combined mass of the two small nuclei is greater than the mass of the resulting nucleus.

This decrease in mass, m, appears as energy, E, according to the equation.

$$E = mc^2$$

c is the speed of light = 3.0×10^8 m/s.
The energy released in one fusion reaction is 4.5×10^{-12} J.
Calculate the decrease in mass.

(3)

decrease in mass = ... kg

(Total for question = 6 marks)

Downloaded from www.merit-minds.com