Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: GCSE Triple Science Atomic Structure (High Demand Questions)

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

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

Q1.

(a) Alpha particles (α), beta particles (β) and gamma rays (γ) are types of nuclear radiation.

(i) Which of the three types of radiation is the most strongly ionising?

_____

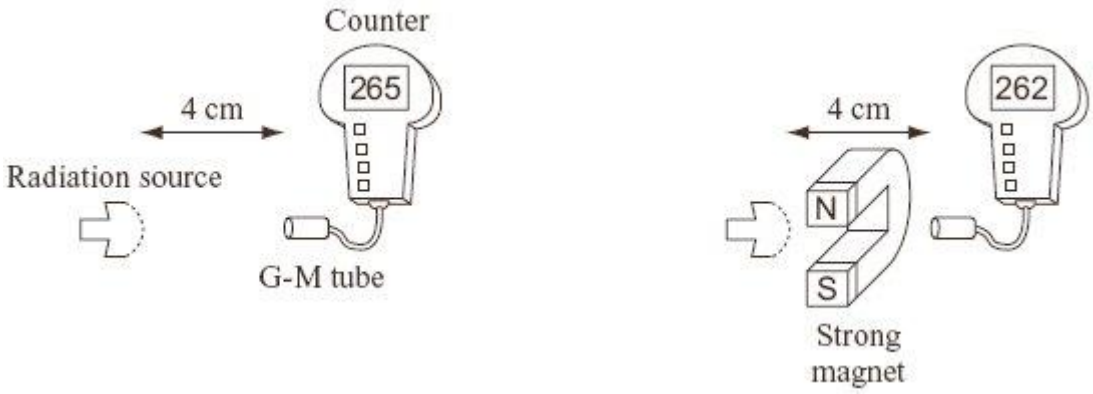
(1)

(ii) What effect does nuclear radiation have on living cells?

_____

(1)

(b) The diagrams show a G-M tube and counter used to measure the radiation emitted from a source. Both diagrams show the reading on the counter one minute after it was switched on.



Explain why the counter readings show that the source is giving out only gamma radiation.

_____

_____

_____

_____

(2)

(c) The box gives information about the radioactive isotope technetium-99.

Type of radiation emitted: gamma
Half-life: 6 hours

Downloaded from www.merit-minds.com

Used as a medical tracer

What is meant by the term *half-life*?

_____

_____

(1)

(d) To study the blood flow in a patient's lungs, a doctor injects a small quantity of a technetium-99 compound into the patient. The radiation emitted by the technetium-99 atoms is detected outside the patient's body.

Explain why a doctor would not use a radioactive isotope with a very short half-life, such as 2 seconds, as a medical tracer.

_____

_____

_____

_____

(2)

(Total 7 marks)

Q2.

(a) Nuclear power stations use the energy released by *nuclear fission* to generate electricity.

(i) Explain what is meant by *nuclear fission*.

_____

_____

_____

(2)

(ii) How does nuclear fission lead to a chain reaction?

You may give your answer as a labelled diagram.

_____

_____

(1)

(b) Although nuclear fuels are relatively cheap the total cost of generating electricity using nuclear fuels is expensive. Why?

Downloaded from www.merit-minds.com

_____

_____

(1)

(c) The table compares the energy released from 1 kg of coal and 1 kg of uranium.

Coal	29 MJ
Uranium	580 000 MJ

1 MJ = 1 000 000 joules

State **one** benefit to the environment of using a concentrated fuel like uranium to generate electricity rather than using the energy from coal.

_____

_____

(1)

(Total 5 marks)

Q3.

A beta particle is a high-energy electron.

(i) Which part of an atom emits a beta particle?

_____

(1)

(ii) How does the composition of an atom change when it emits a beta particle?

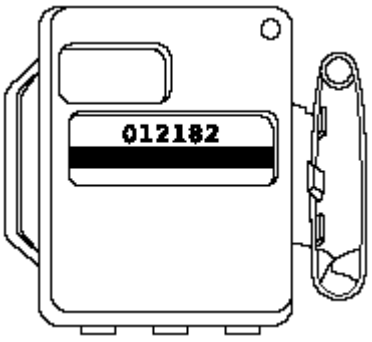
_____

(1)

(Total 2 marks)

Q4.

The diagram shows a badge used to monitor radiation. It measures the amount of radiation a worker has been exposed to in one month.



(i) What is used inside the badge to detect radiation?

_____

(1)

(ii) What would indicate that the worker has been exposed to a high level of radiation as opposed

Downloaded from www.merit-minds.com

to a low level of radiation?

_____

_____

(1)

(iii) Why is it important to monitor the amount of radiation the worker has been exposed to?

_____

_____

(1)

(Total 3 marks)

Downloaded from www.merit-minds.com