

Name of the Student: _____

Max. Marks : 18 Marks

Time : 18 Minutes

Q1.

Everyone is exposed to background radiation. Some of this radiation comes from natural sources.

* There are many radioactive isotopes in nuclear waste.

Technetium-99 is just one of these isotopes.

People are worried about how we should deal with nuclear waste.

Explain why it is difficult to deal with nuclear waste safely.

(6)

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Q2.

Radioactivity from radioactive sources can be used in the diagnosis and treatment of cancer.

Describe **one** way radioactivity can be used in the diagnosis of cancer and **one** way radioactivity can be used in the treatment of cancer.

(6)

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(Total for question = 6 marks)

Q3.

Answer the question with a cross in the box you think is correct ☐ . If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☐ .

This question is about radioactivity.

Alpha (α), beta (β) and gamma (γ) are three types of radioactive emissions.

Which statement describes **all** of these radioactive emissions?

(1)

- ☐ A ionising and emitted by stable nuclei
- ☐ B ionising and emitted by unstable nuclei
- ☐ C neutral and emitted by stable nuclei
- ☐ D neutral and emitted by unstable nuclei

(Total for question = 1 mark)

Q4.

A nuclear fusion reaction is happening in our Sun.

The nuclear fusion reaction produces helium and radiates energy.

(i) State **one** of the conditions necessary for this nuclear fusion reaction to start.

(1)

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(ii) Describe what happens in this nuclear fusion reaction.

(2)

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(iii) The intensity of the Sun's radiation in W/m^2 on the surface of Earth is 1.32×10^3 .

The intensity of the Sun's radiation in W/m^2 on the surface of Mars is 4.92×10^2 .

Calculate the ratio

$$\frac{\text{intensity of the Sun's radiation on the surface of Earth}}{\text{intensity of the Sun's radiation on the surface of Mars}}$$

(2)

ratio =

(Total for question = 5 marks)