Q1.

Lead-214 is a radioactive isotope.

(i) State **one** way in which radioactive isotopes can be harmful to people.

(1)

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.....

(Total for question = 1 marks)

Q2.

Describe how the emissions from radioactive substances can be dangerous to living things.

(2)

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.....

(Total for question = 2 marks)

Q3.

Figure 10 shows a safety sign on the door of a laboratory where radioactive materials are used.

Figure 10

(i) State **one** way that radioactivity can be dangerous to humans.

(1)

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(Total for question = 1 marks)

Q4.

Explain how radiation from radioactive sources can be dangerous to people.

(2)

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(Total for question = 1 marks)

Q5.

Every hospital radiographer who works with radiation wears a radiation badge.

The badge is used to monitor the amount of radiation the radiographer absorbs each month.

(i) Explain why it is important to monitor the amount of radiation a radiographer absorbs each month.

(2)

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(ii) Radiographers are restricted to a smaller annual dose of radiation nowadays compared to 50 years ago.

Complete the sentence by putting a cross (☒) in the box next to your answer.
This is because nowadays,

(1)

☒ **A** the radioactive sources have decayed

☒ **B** we can measure radiation more accurately

☒ **C** we have a better understanding of the risks from radiation

☒ **D** we have more effective ways of shielding against radiation

(Total for question = 3 marks)

Q6.

(a) Describe how the emissions from radioactive substances can be dangerous to living things.

(2)

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(b) Explain **one** precaution that is taken in hospitals to limit the risks of exposure to radiation.

(2)

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(Total for Question = 4 marks)

Q7.

A teacher sets up an experiment to show some students how far beta particles travel in air.

Figure 10 shows some of the equipment she uses.

(Source: *www.einstein.yu.edu*)

Figure 10

(i) State the scientific name for the radioactivity detector shown in Figure 10.

(1)

.....

The teacher also has:

- a radioactive source that emits only beta particles
- a metre rule.(ii) State **two** precautions the teacher must take to protect herself from the effects of radioactivity.

(2)

1 .....

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2 .....

.....

(Total for question = 3 marks)

Q8.

Some questions must be answered with a cross in a box (☒). If you change your mind about an answer, put a line through the box (☒) and then mark your new answer with a cross (☒).

Radioactive tracers can be used when scanning a person's kidneys.

A radioactive isotope is injected into a person's blood stream.

The isotope emits radiation.

As the blood flows through the kidneys, this radiation is detected outside the body by a scanner.

During the scan, a technician needs to take readings for about 30 minutes.
The half-life of the isotope used is about 6 hours.

(iii) State **two** ways of reducing the radiation risks to the technician.

(2)

1 .....

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2 .....

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(Total for question = 2 marks)

Q9.

Medical staff who use radioactive materials need more protection than their patients.

Describe some precautions that medical staff can take to ensure their safety from radioactive materials.

(3)

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(Total for question = 3 marks)

Q10.

Explain **one** precaution that is taken in hospitals to limit the risks of exposure to radiation.

(2)

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(Total for question = 2 marks)

Q11.

* Exposing people to radioactive sources can be dangerous.

Describe the dangers of exposure to radioactive sources and what can be done to protect hospital staff when they are working with radioactive sources.

(6)

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(Total for question = 6 marks)