

**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)**

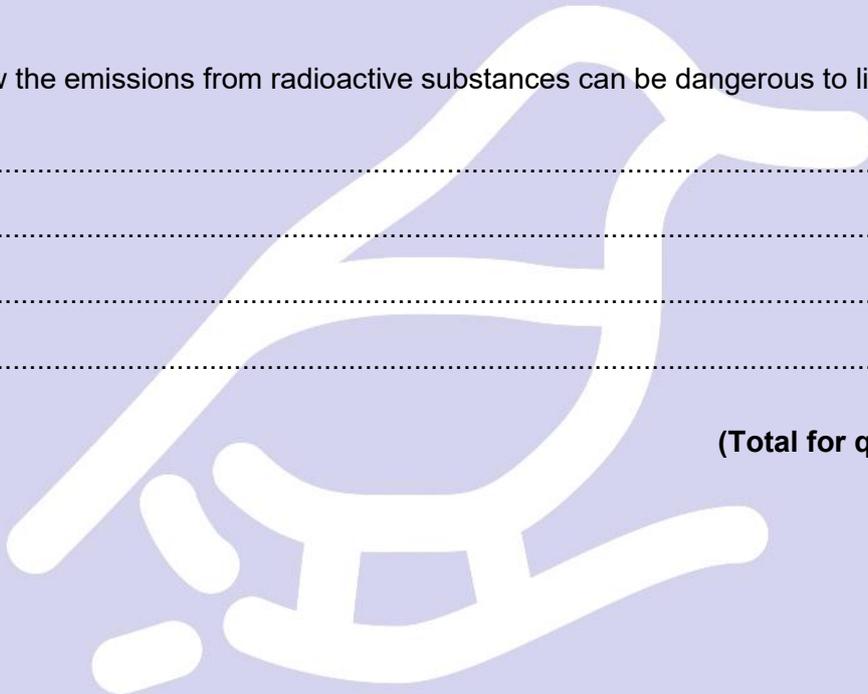
**Q2.**

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)

.....

.....

**(Total for question = 1 marks)**

**Q4.**

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

(2)

.....

.....

.....

**(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)

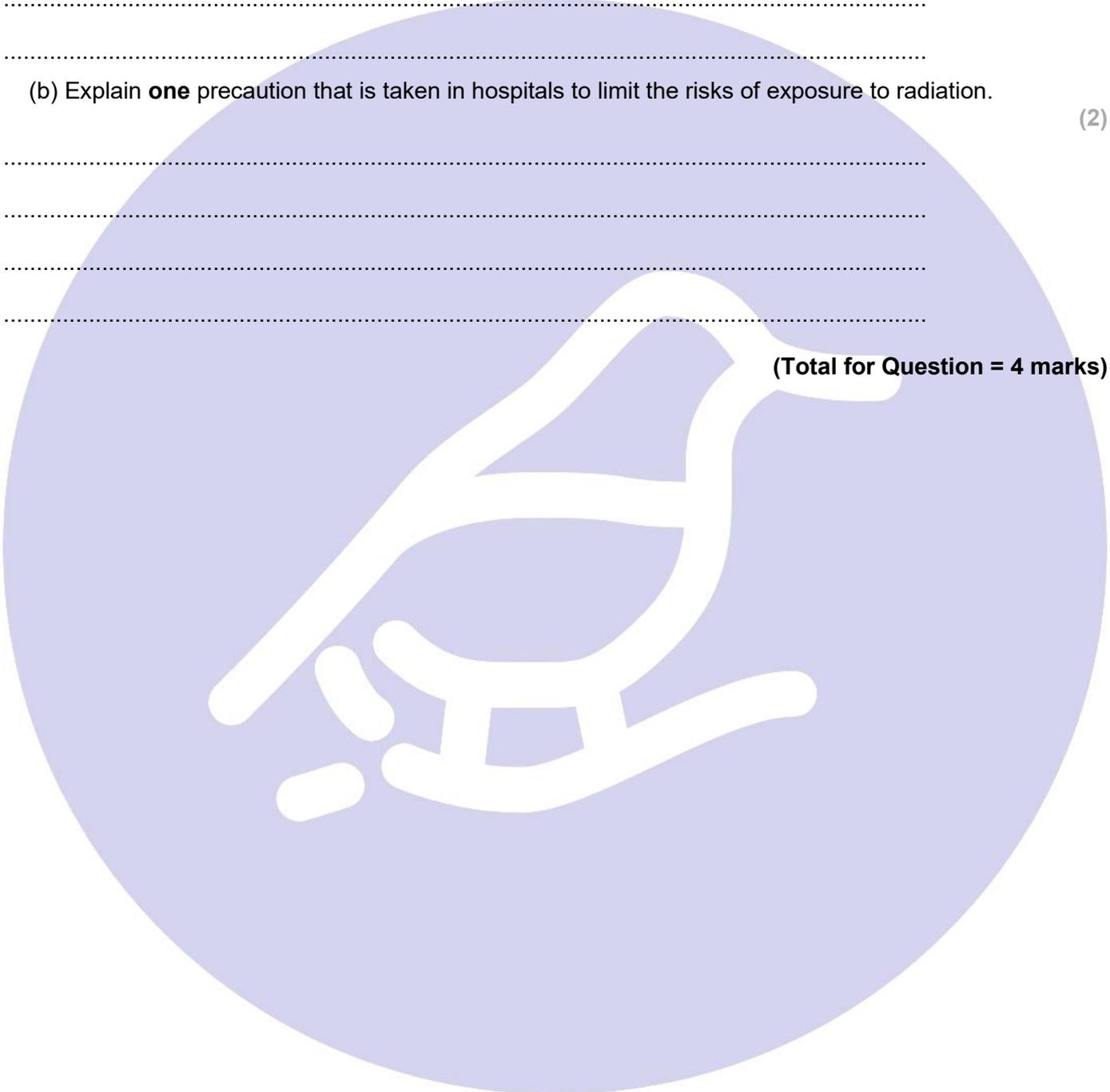
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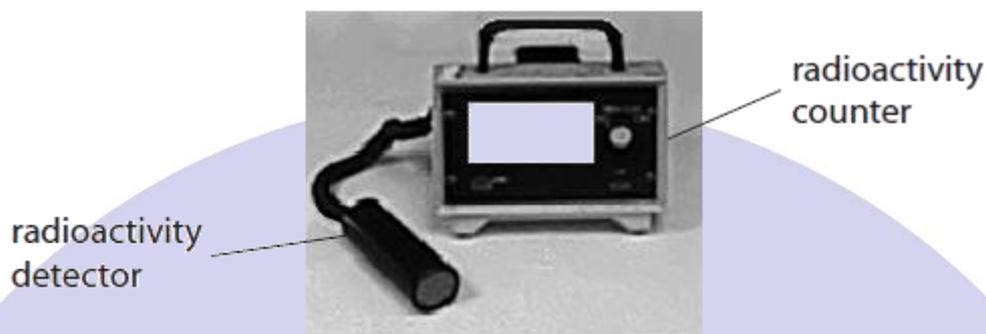
**(Total for Question = 4 marks)**



**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](http://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 .....

.....

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 .....  
.....  
.....  
2 .....  
.....  
.....

**(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)**

