

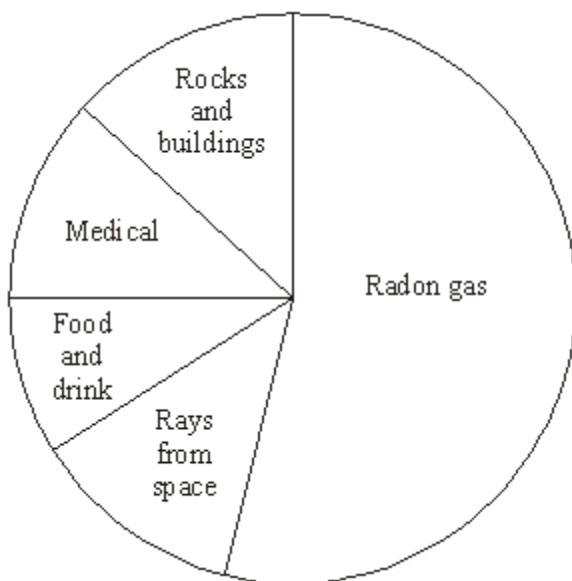
Name of the Student: _____

Max. Marks : 22 Marks

Time : 22 Minutes

Q1.

Radiation is around us all of the time. The pie chart shows the sources of this radiation.



(i) What is the main source of this radiation?

(1)

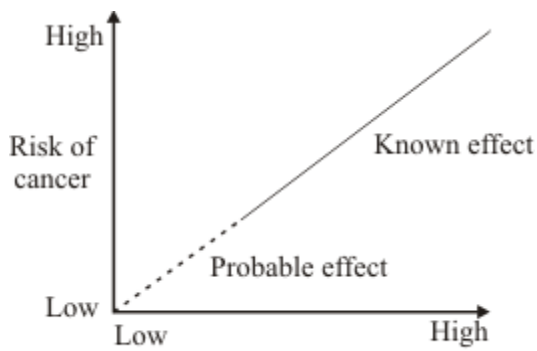
(ii) What name is given to the radiation that is around us all of the time?

(1)

(Total 2 marks)

Q2.

(a) Radiation can cause cancer. The graph shows that the risk of cancer depends on the radiation dose a person is exposed to.



Complete the following sentence.

The _____ the dose of radiation a person gets, the greater the risk of cancer.

(1)

- (b) A worker in a nuclear power station wears a special badge (diagram 1). Diagram 2 shows what is inside the badge. When the film inside the badge is developed, it will be dark in the places where it has absorbed radiation.

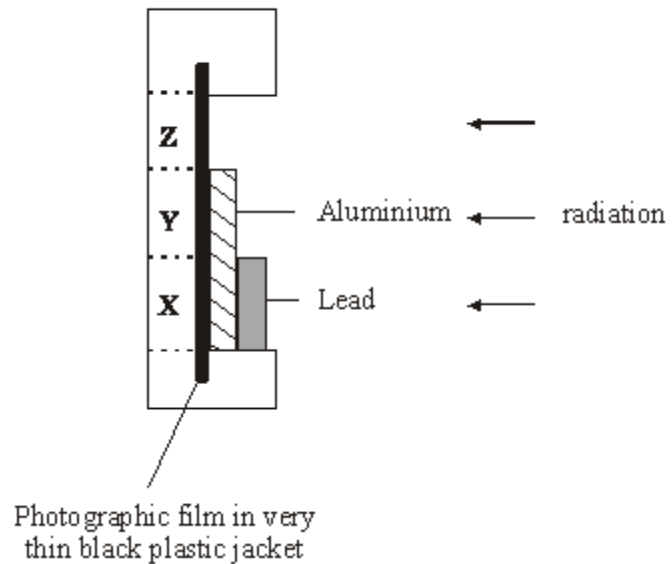
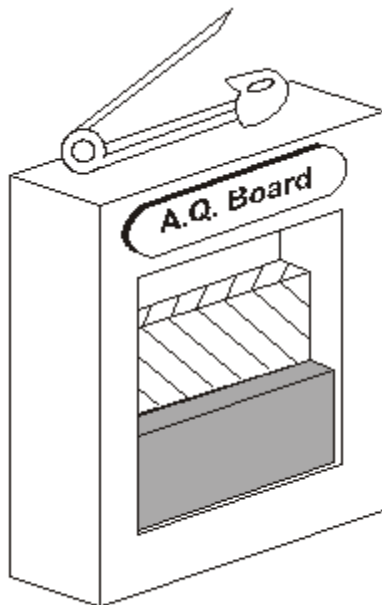


Diagram 1

Diagram 2

Which part of the film, X, Y or Z, would darken if the worker had received a dose of alpha radiation?

Give a reason for your answer.

(2)
(Total 3 marks)

Q3.

- (a) The diagram shows a hazard sign.



What type of hazard does this sign warn you about?

(1)

- (b) The names of three types of radiation are given in the box.

alpha (α)	beta (β)	gamma (γ)
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Complete each sentence by choosing the correct type of radiation from those given in the box. Each type of radiation should be used once or not at all.

- (i) The type of radiation that travels at the speed of light is _____

(1)

- (ii) The type of radiation that is stopped by thick paper is _____

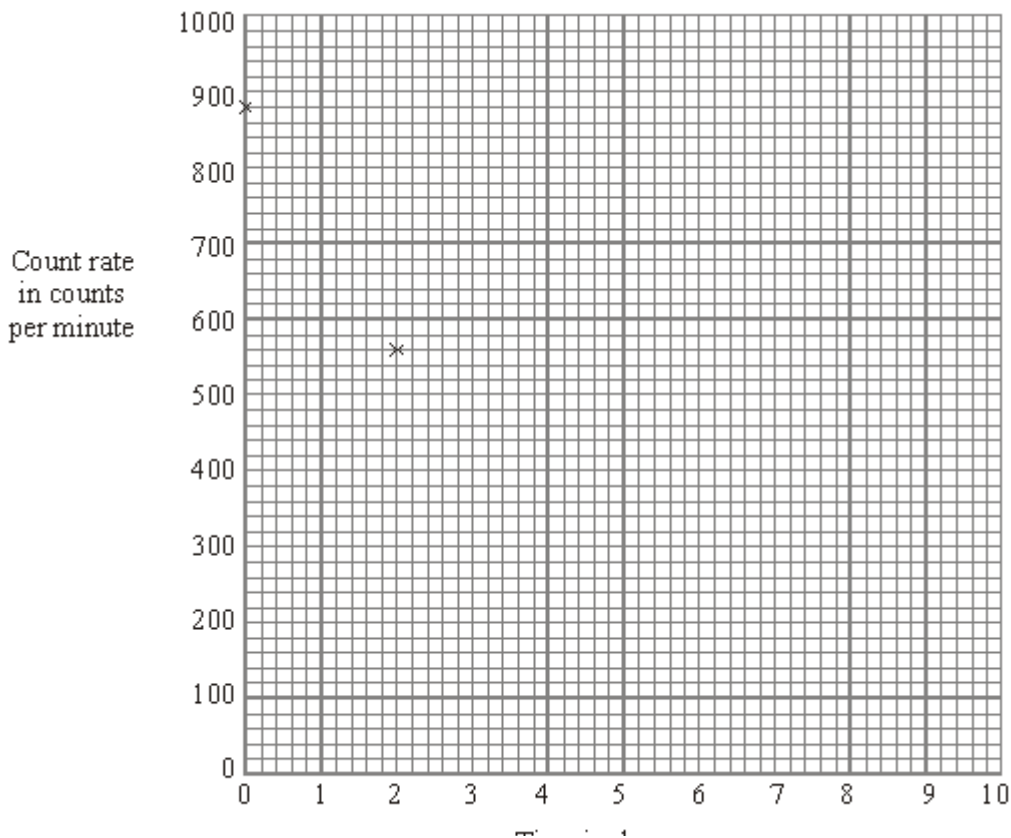
(1)**(Total 3 marks)****Q4.**

The table shows how the count rate from a radioactive substance changes in 10 days.

Time in days	0	2	4	6	8	10
Count rate in counts per minute	880	555	350	220	140	90

- (a) Draw a graph of count rate against time.

The first two points have been plotted for you.



(3)

- (b) (i) Use your graph to find out how long it takes for the count rate to fall from 880 counts per minute to 440 counts per minute.

Time = _____ days

(1)

- (ii) What is the half-life of this substance?

Half-life = _____ days

(1)

- (c) The table gives the half-life and type of radiation given out by four different radioactive isotopes.

Radioactive isotope	Half-life in days	Radiation given out
bismuth-210	5.0	beta
polonium-210	138.0	alpha and gamma
radon-222	3.8	alpha
thorium-234	24.1	beta and gamma

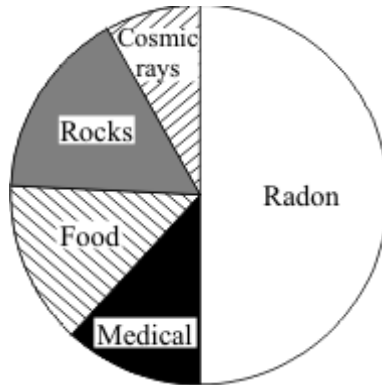
Some samples of each isotope have the same count rate today. Which sample will have the lowest count rate one month from today?

Give a reason for your answer.

(2)
(Total 7 marks)

Q5.

(a) The pie-chart shows the main sources of background radiation.



(i) Which source in the pie-chart adds the smallest amount of radiation to background levels?

(1)

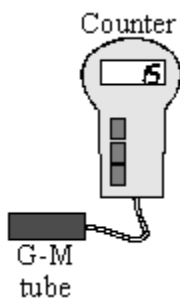
(ii) Name **two** natural sources of background radiation in the pie-chart.

1. _____

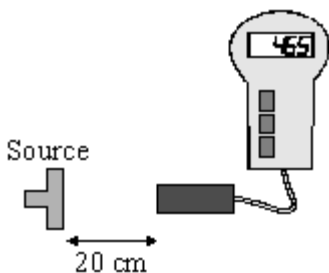
2. _____

(2)

(b) The diagrams show how a radiation detector and counter can be used to measure radiation levels. In each case the numbers show the count one minute after the counter is switched on.



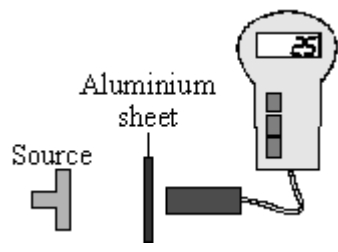
(i) How many counts are just from background radiation?



(ii) How many counts are just from the source?

(iii) What type of radiation did the source give out?

Give a reason for your answer.



(4)
(Total 7 marks)