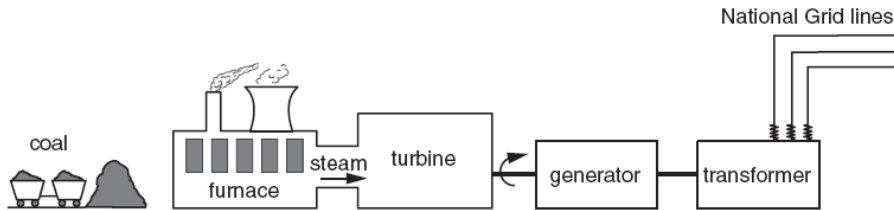


P3 Assessed Task

- 5 (a) The diagram shows how a coal-fired power station generates electricity for the National Grid.



- (i) Describe the processes that take place when coal is burned to generate electricity.

.....

 [3]

- (ii) Electricity is described as a secondary energy source.

Explain what is meant by a **secondary energy source**.



One mark is for using correct spelling, punctuation and grammar.

.....
 [1+1]

- (b) The government aims for 10% of all electricity to be generated from renewable sources by 2010.

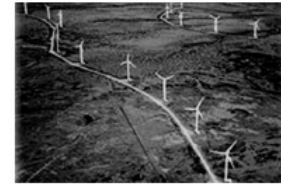
Read this information.

Wind farms planned for Britain's coasts

Huge areas off the coasts of Britain will be opened to huge wind farms.

Each may contain up to 300 turbines.

Up to 20 000 new jobs will be created.



Campaigners describe this as the dawn of a new clean energy age.

The new turbines will be the biggest ever anywhere in the world.

They will be sited five miles out to sea to lessen the visual impact.

The first project involves 30 turbines off the North Wales coast.

The energy produced by the proposed new developments will be enough to power more than 3.5 million households.

Some people are not convinced about building wind farms on this scale. Here are some of their thoughts.



a keen birdwatcher says

Research shows that wind farms kill birds. An offshore farm in North Wales could harm the last colony of little terns in Wales. The birds are protected 24 hours a day on land, but we have no idea where they feed.

Wind power is not completely clean. You have to build huge concrete foundations under the sea. There will have to be a land based station and service roads and so on. Power stations will have to be kept on standby for when the wind isn't blowing.



said an energy expert



a man who lives on the Welsh coast says

The government is more interested in big projects and not in energy conservation. They should tell people to use less energy. I'm in favour of renewables but not at the expense of our countryside and coast.

Use the information given and your knowledge about power generation to discuss the disadvantages and benefits of building wind farms to generate some of the country's electricity.

You should identify in your discussion who would suffer from the disadvantages and who would benefit from such a development.

disadvantages

.....

.....

.....

.....

benefits

.....

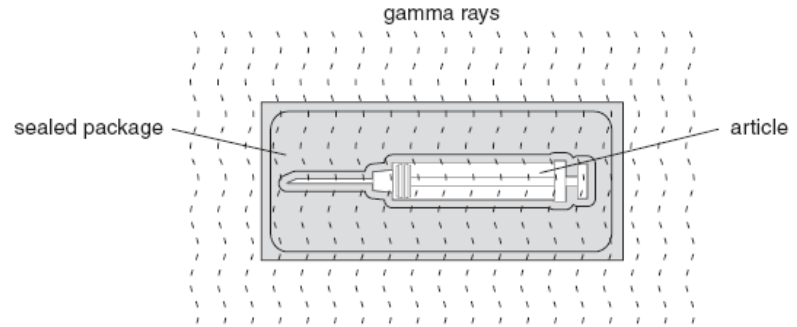
.....

.....

..... [6]

[Total: 11]

7 Many medical products are sterilised using gamma radiation. The radiation passes through packaging to sterilise the product inside.



(a) What properties of gamma rays make them more suitable for sterilising medical products than alpha or beta particles?

..... [2]

(b) A radioactive source commonly used is cobalt-60, which emits gamma rays and has a half-life of about 5.26 years.

(i) Explain what is meant by saying that cobalt-60 has a **half-life** of 5.26 years.

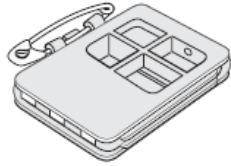
..... [2]

(ii) Another radioactive source, iron-59 also emits gamma radiation. It has a half-life of 45 days.

Use your ideas about half-life to suggest why iron-59 would be less suitable as the source of gamma radiation for sterilisation.

..... [2]

(c) Workers who operate the sterilisation process wear a badge to record their exposure to ionising radiation.



(i) The amount of ionising radiation that the workers are exposed to must be limited.

Explain why.

.....
.....
..... [2]

(ii) The badge can be used to calculate the radiation dose the worker has received.

What information does the measured radiation dose give us about the risk to the worker?

..... [1]

(d) Name **one** other group of people who are at risk from exposure to radiation and suggest what precautions they can take to reduce the risk.

.....
.....
..... [2]

[Total: 11]

Grade	Per Cent
A*	95
A	85
B	75
C	65
D	55
E	45