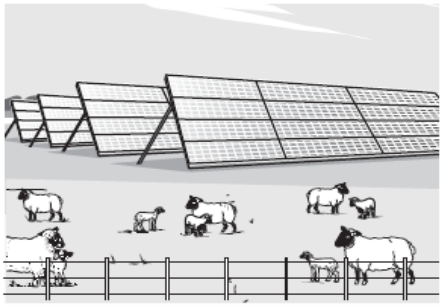
Oxford Cambridge and RSA

GCSE Physics B (Twenty First Century Science)

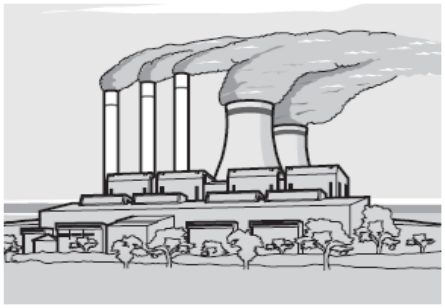
J259/02 Depth in physics (Foundation Tier)

Question Set 4

1 Solar farms are large power stations made up from many photovoltaic (PV) panels. Even though they are now very common, most of Britain's electricity is generated by burning gas.



A solar farm



A gas-burning power station

(a) Here are some data about these two types of power station.

Type of power station	Solar farm	Gas-burning
Power output (MW)	35	1400

(i) Calculate the number of solar farms that would be needed to give the output power of this gas-burning power station.

$\frac{1400}{35} = 40$

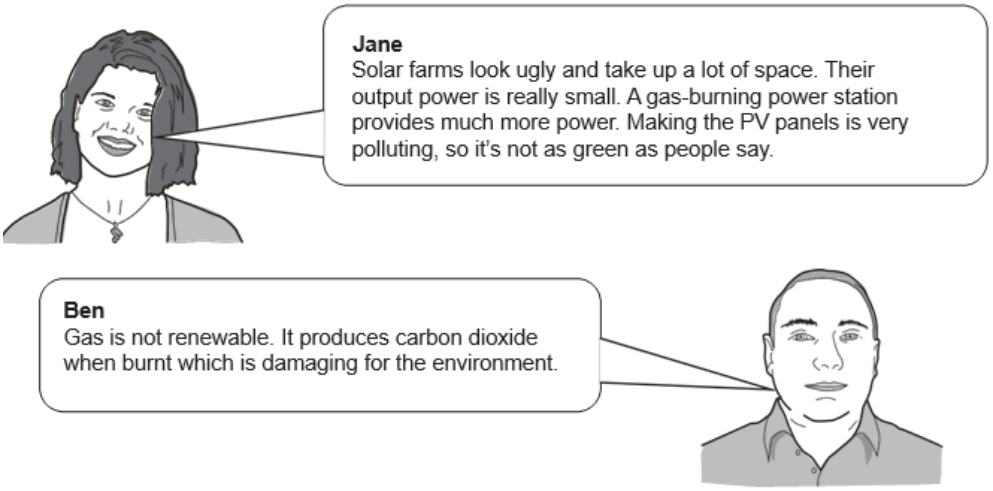
Number of solar farms = 40 **[2]**

(ii) In the table, the 35 MW power of the solar farm is the **maximum** power it can produce.

Give **two** reasons why the output power is often less than 35 MW.

Solar panels don't work at night and less power is generated when it is cloudy. **[2]**

(b)* Jane and Ben have different views about these power stations.



Describe the **advantages** and **disadvantages** of both power stations using Jane and Ben's views. **[6]**

Solar Farms

Advantages

- Less pollution and no CO_2 produced so better for the environment
- It is renewable so it will not run out.

Disadvantages

- Ugly and they take up space.
- Produces 40x less power.
- Solar panel production is polluting.
- Reliant on the weather.

Gas burning power station

Advantages

- Produces 40x more power than solar farms.
- Gas is not reliant on weather conditions / light levels.

Disadvantages

- Gas is non-renewable so it will run out (finite).
- It produces CO_2, which contributes to climate change and damages the environment.

Total Marks for Question Set 4: 10