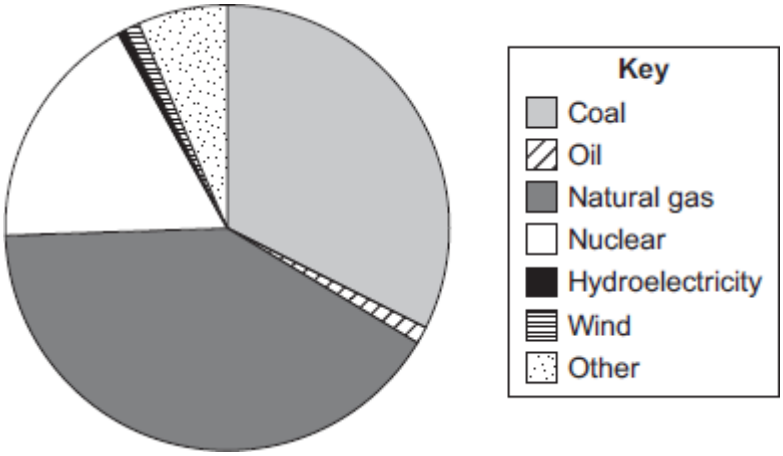
Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

(a) The pie chart shows how the electricity generated in the UK is produced using different energy resources.



(i) Which energy resource is used to generate approximately one third of the UK's electricity?

_____

(1)

(ii) Name **two** energy resources that could be part of the 'Other' energy resources used to generate electricity in the UK.

1. _____

2. _____

(2)

(b) *In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

Fossil fuel power stations burn coal, oil and gas. Burning these fuels pollutes the atmosphere with greenhouse gases. The government is considering investing in new nuclear power stations, rather than relying on fossil fuel power stations.

The government is also considering more investment in alternative energy resources. Wind power may be used because the UK is a very windy country. In one year, there is enough wind in the UK to supply all of our electricity needs.

Do you think the government should invest in wind power or nuclear power?

Draw a ring around the energy resource that you think the government should invest in.

Nuclear / Wind

Discuss the advantages of the energy resource you have chosen and the disadvantages of the energy resource you did **not** choose.

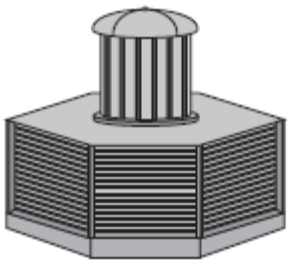
(6)

(Total 9 marks)

Q2.

A community of people living on an island are considering buying wind turbines to supply their electricity. The community have looked at two types of wind turbine.

Vertical Axis Wind Turbine



Horizontal Axis Wind Turbine

Not to scale

The community looked at information about the two different types of wind turbine.

Vertical axis wind turbines	Horizontal axis wind turbines
• **Vertical axis wind turbines** start to rotate at wind speeds of 1.5 m/s. • Vertical axis wind turbines are powered by wind coming from any direction. • The power output at 12 m/s is 1 MW. • The wind turbines continue to generate electricity until the wind speed reaches 40 m/s.	• **Horizontal axis wind turbines** start to rotate at wind speeds of 3.6 m/s. • Horizontal axis wind turbines turn to point into the wind. • The power output at 12 m/s is 1 MW. • At very high wind speeds, above 20 m/s, the wind turbines stop working automatically to avoid damage.

(a) The community decide that vertical axis wind turbines would be better.

Use the information given to suggest why.

_____

_____

_____

_____

_____

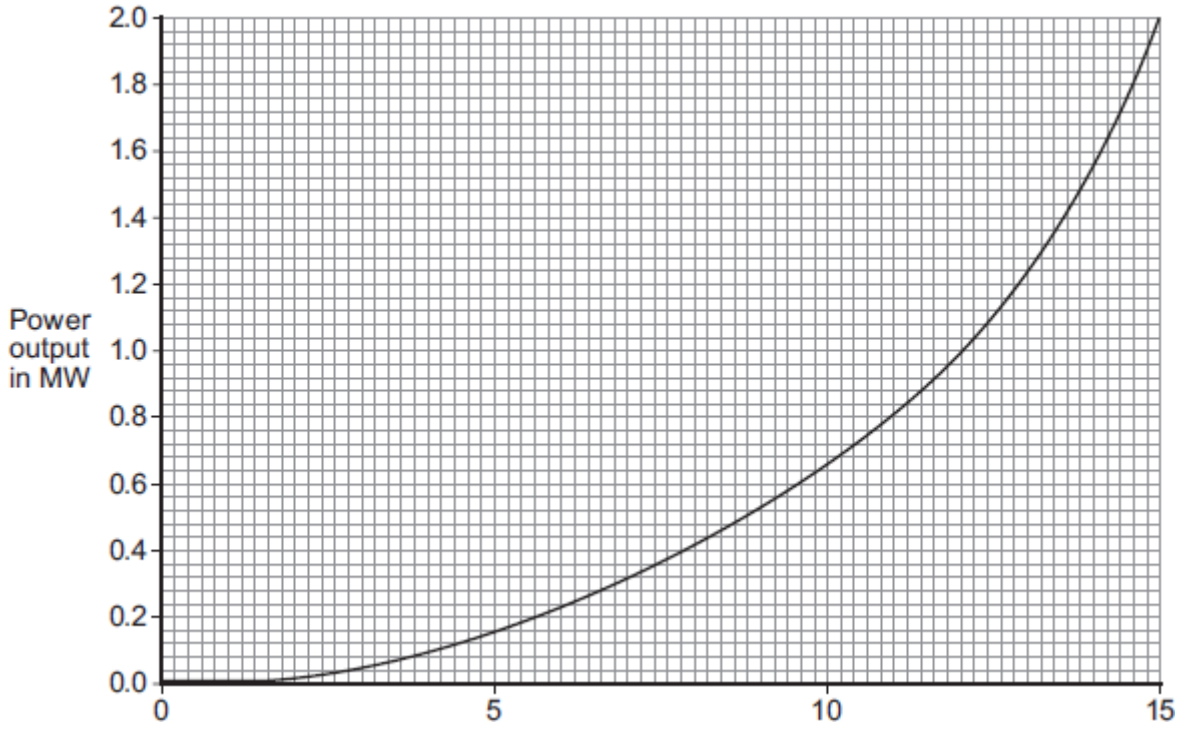
_____

_____

(3)

(b) **Graph 1** shows how the power output varies with wind speed for a vertical axis wind turbine.

Graph 1



Wind speed in m/s

Describe how the power output of this wind turbine varies with wind speed for the range of wind speeds shown.

_____

_____

_____

_____

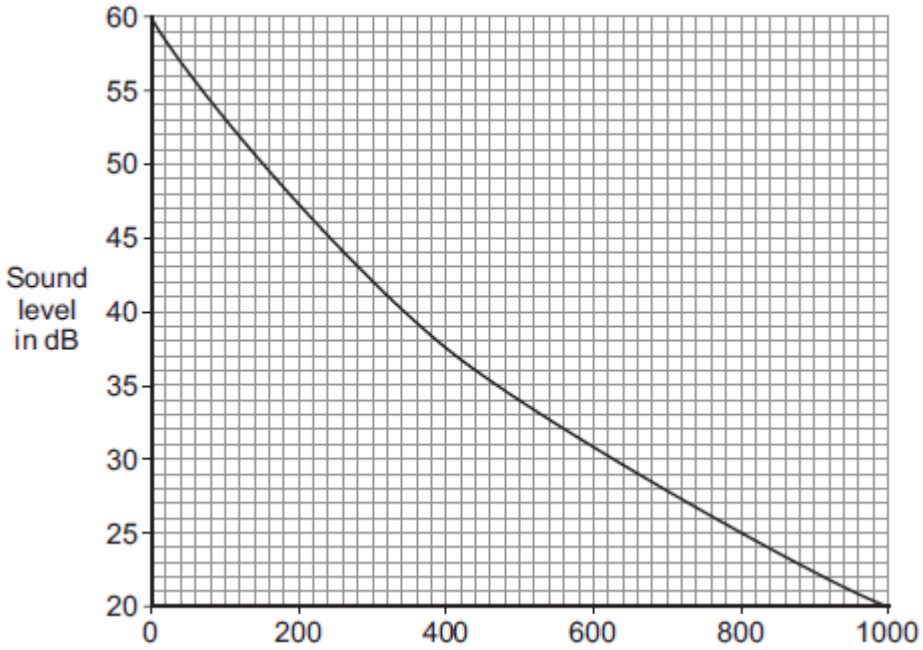
(2)

(c) Some local people do not want the wind turbines. These people say the wind turbines are too noisy.

Graph 2 shows how the sound level detected changes with distance from a wind turbine.

Sound level is measured in decibels, dB.

Graph 2



The sound level of a normal conversation is 50 dB.

(i) How far from the wind turbine would a person need to stand to detect a sound level of 50 dB?

Distance = _____ metres

(1)

(ii) The graph shows that 1000 m away you can still hear the noise the wind turbines produce.

A sound level of 30 dB is the same as a person whispering in another person's ear.
The nearest house to the wind turbine is 1000 m away.

Some people do not want the wind turbines because of the noise the wind turbines produce.

Are these people justified in not wanting wind turbines?

Give reasons for your answer.

_____

_____

_____

_____

(2)

(d) On the mainland, wind turbines are connected to the National Grid.

Electricity is transmitted through the power lines of the National Grid at very high voltages and low currents.

State why.

_____

_____

(1)

(Total 9 marks)