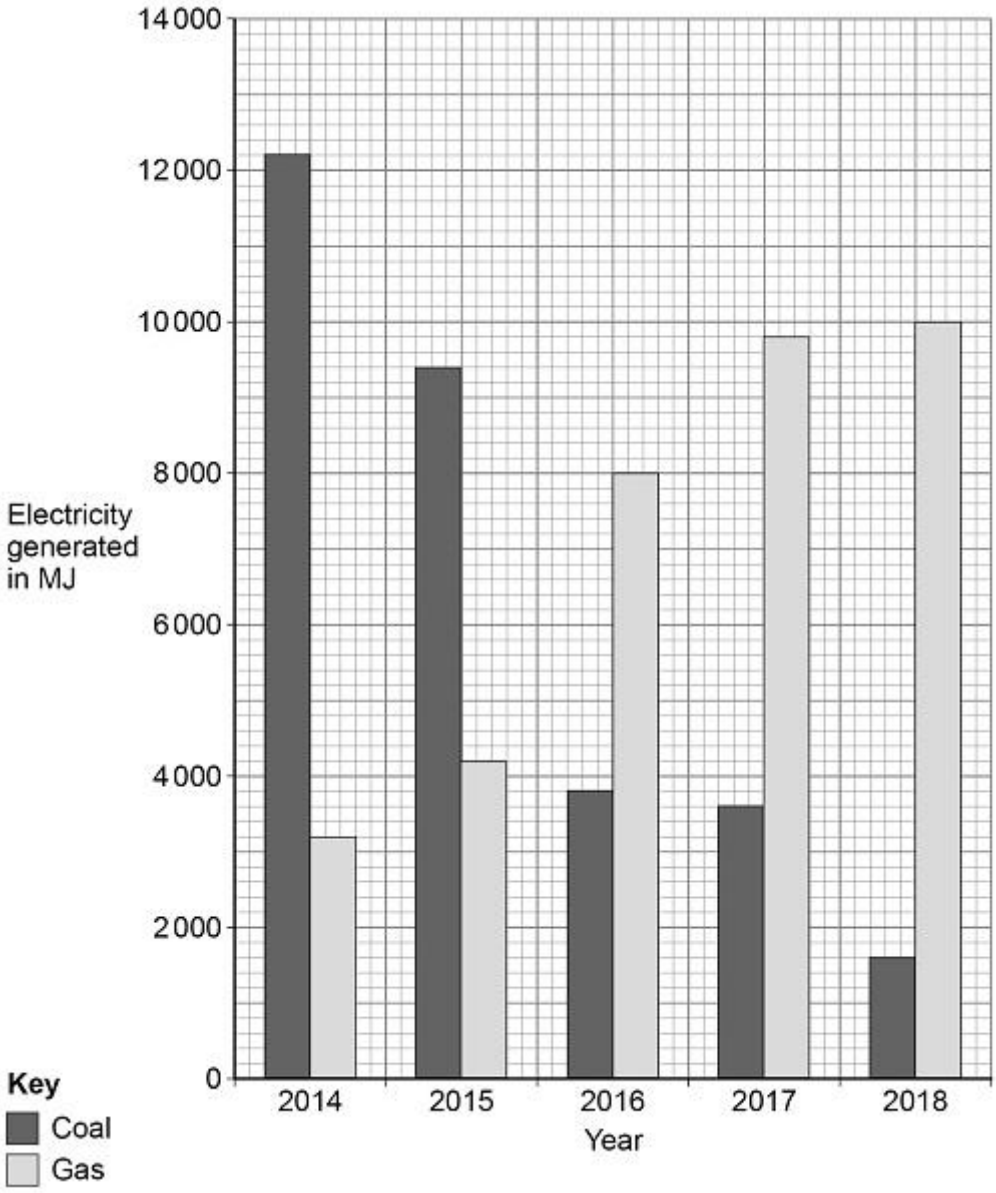
Name of the Student:_____
Max. Marks :18 **Marks** **Time :18 Minutes**

Q1.

Figure 1 shows how much electricity was generated using coal-fired and gas-fired power stations in January for 5 years in the UK.

Figure 1



(a) Determine the percentage increase in electricity generated using gas-fired power stations from 2014 to 2018.

_____

_____

_____

Percentage increase = _____%

(2)

(b) Give **two** environmental advantages of using a gas-fired power station to generate electricity compared with using a coal-fired power station.

1 _____

_____

2 _____

_____

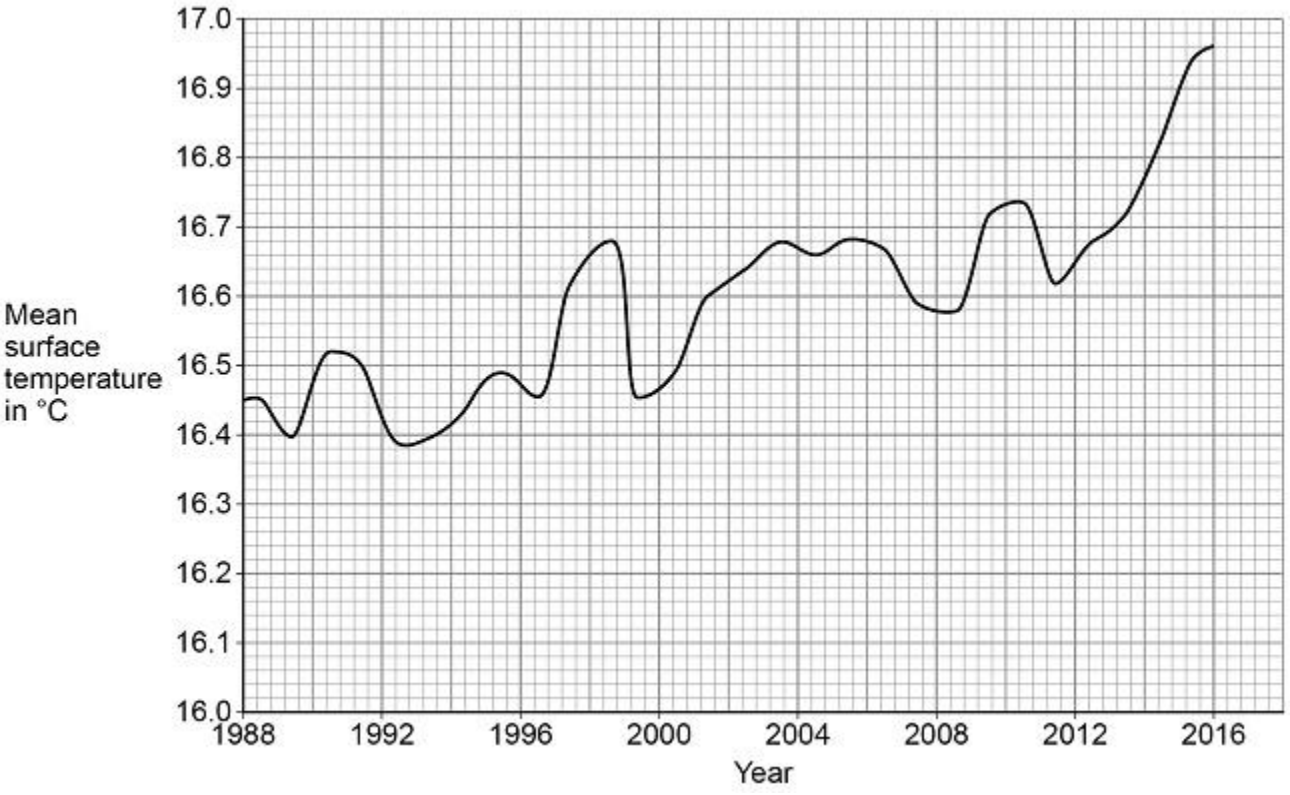
(2)

The mean surface temperature of the sea changes throughout the year.

A change in the mean surface temperature from year to year indicates climate change.

Figure 2 shows how the mean surface temperature changed between 1988 and 2016.

Figure 2



(c) A student does not believe that climate change is occurring.

Explain how the data in **Figure 2** suggests the student is wrong.

_____

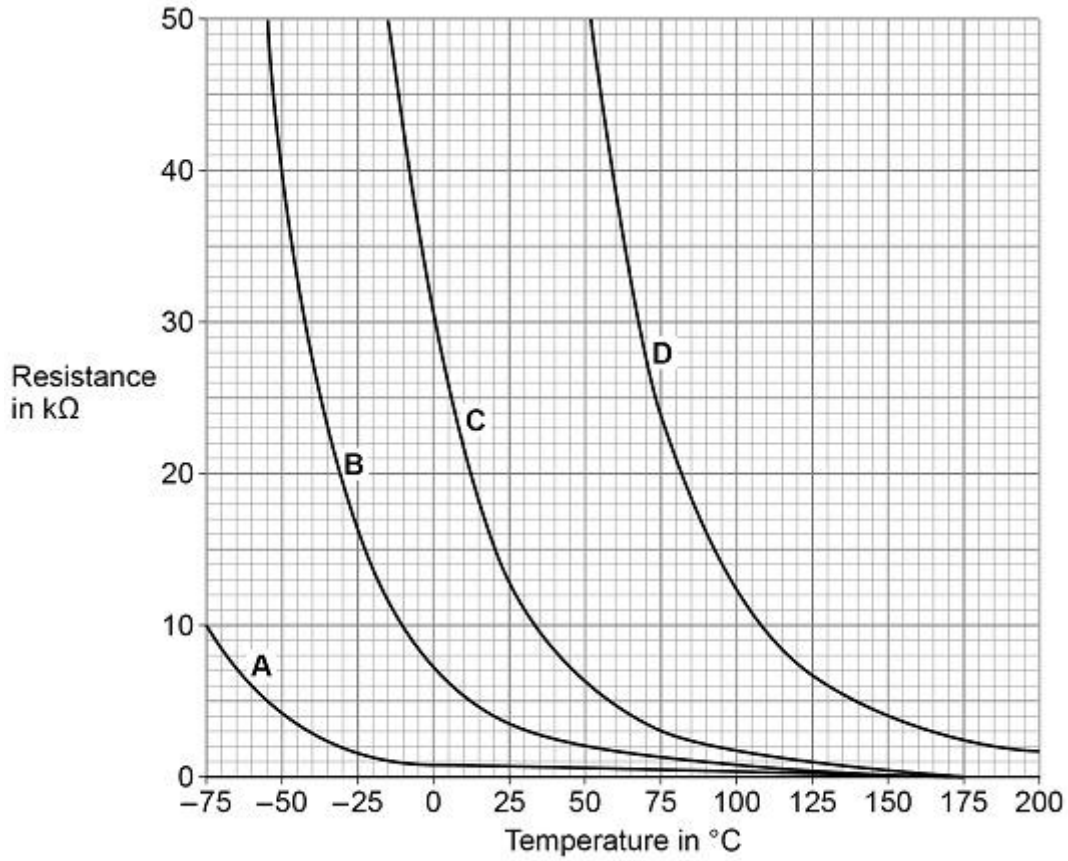
_____

(2)

(d) A thermistor can be used to measure temperature.

Figure 3 shows how the resistance of four different thermistors A, B, C and D, varies with temperature.

Figure 3



Which of the four thermistors would be the most suitable to measure the surface temperature of the sea?

Tick (✓) **one** box.

Explain your answer.

A	B	C	D
☐	☐	☐	☐

_____

(3)

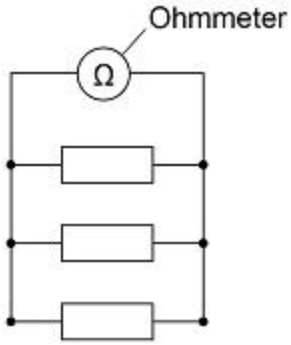
(Total 9 marks)

Q2.

A student investigated how the total resistance of identical resistors connected in parallel varied with the number of resistors.

The student used an ohmmeter to measure the total resistance of the resistors.

The diagram below shows the student's circuit with 3 resistors.



The student repeated each reading of resistance three times.

The table below shows some of the results for 3 resistors in parallel.

Number of resistors	Total resistance in ohms			
	Reading 1	Reading 2	Reading 3	Mean
3	15.8	15.3	**X**	15.7

(a) Calculate value **X** in the table above.

_____

_____

_____

X = _____ Ω

(2)

(b) The student thought that taking a fourth reading would improve the precision of the results.

The fourth reading was 16.2 Ω.

Explain why the student was wrong.

_____

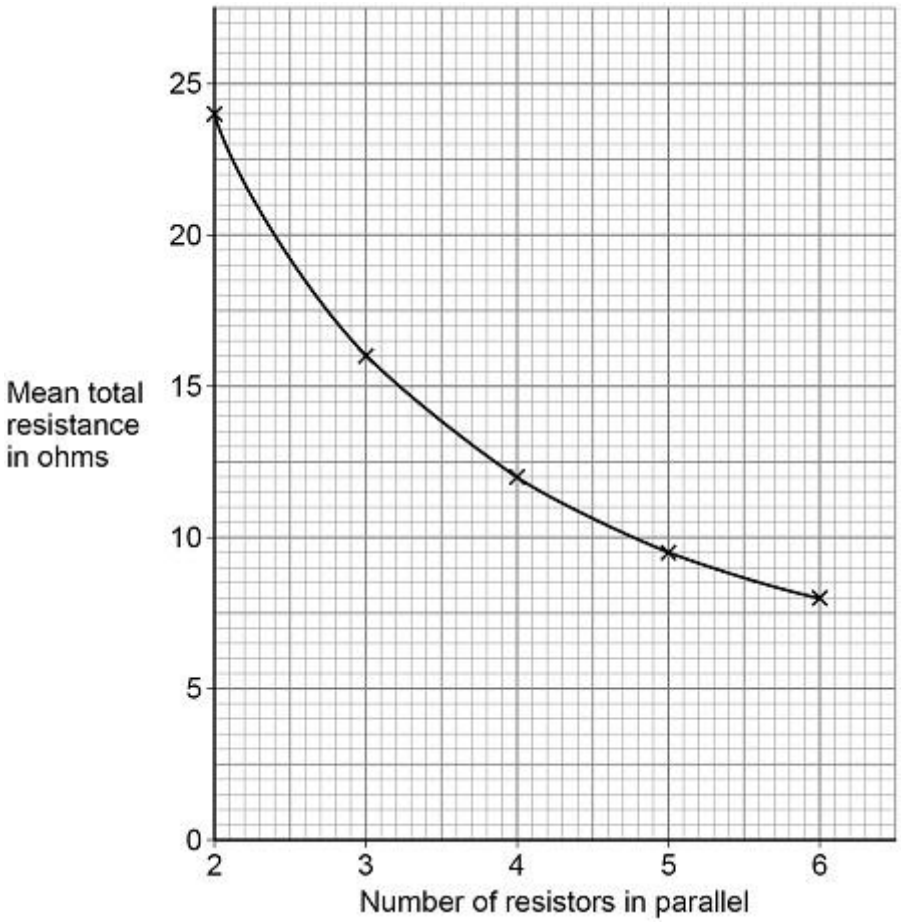
_____

_____

_____

(2)

The graph below shows the results from the investigation.



(c) The student concluded that the number of resistors in parallel was inversely proportional to the mean total resistance.

Explain why the student was correct.

Use data from the graph in your answer.

(3)

(d) Explain why adding resistors in parallel decreases the total resistance.

(2)
(Total 9 marks)