Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

Figure 12 is a speed limit sign from a European motorway.
The speeds shown are in km/h (kilometres per hour).

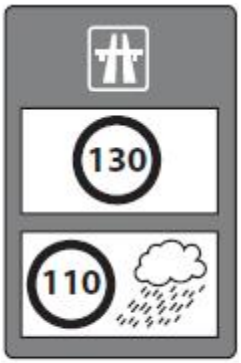


Figure 12

(i) The sign tells drivers to drive at a slower speed in wet weather.
Explain why it is safer for drivers to drive at a slower speed in wet weather.

(2)

.....
.....
.....
.....

(ii) Show that a speed of 31 m/s is less than a speed of 130 km/h.

(2)

(iii)

The driver's reaction time is the time between the driver seeing an emergency and starting to brake.

A car is travelling at a speed of 31 m/s.
The car travels 46 m between the driver seeing an emergency and starting to brake.
Calculate the driver's reaction time.
Give your answer to 2 significant figures.

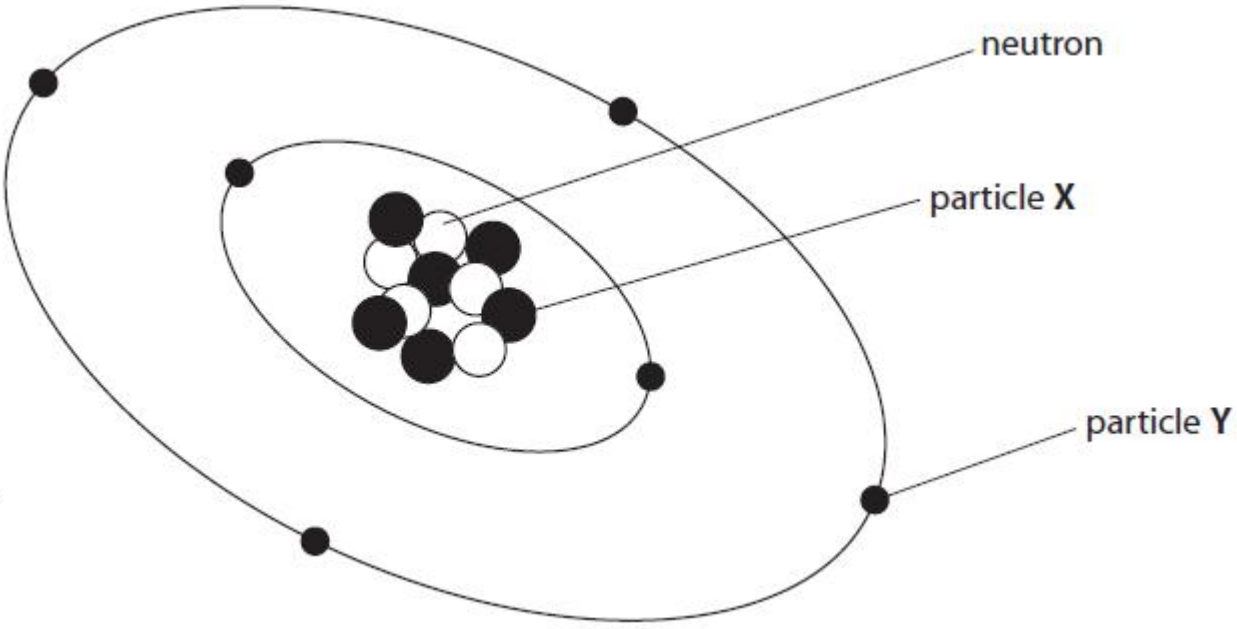
(3)

driver's reaction time = ... s

(Total for question = 7 marks)

Q2.

(a) The diagram represents an atom of carbon.



NOT to scale

(i) State the name of particle **X**.

(1)

.....

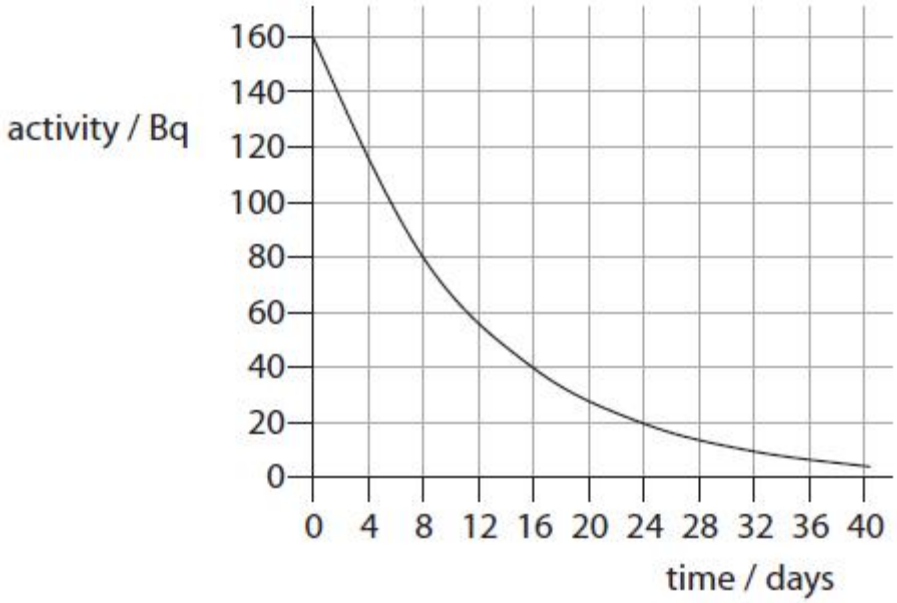
(ii) State the name of particle **Y**.

(1)

.....

(b) Iodine-131 is a radioactive isotope of iodine.

The graph shows how the activity of a sample of iodine-131 decreases with time.



(i) Use the graph to calculate the half-life of iodine-131.

(2)

half-life = ... days

(ii) Another sample of iodine-131 has an activity of 800 Bq.
Calculate how long it will take before its activity decreases to 200 Bq.

(2)

time = ... days

*(c) There are plans to build more nuclear power stations to supply electricity to the National Grid.

Discuss the advantages and disadvantages of using nuclear power to generate electricity.

(6)

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(Total for Question = 12 marks)

Q3.

Complete the sentence by putting a cross (☒) in the box next to your answer.

A student correctly estimated the length of a bee.

The length of a bee is about 2.0

(1)

☒ **A** mm

☒ **B** cm

☒ **C** m

☒ **D** km

Q4.

Complete the sentence by putting a cross (☒) in the box next to your answer.

A student correctly estimated the length of a bee.

The length of a bee is about 2.0

(1)

☒ **A** mm

☒ **B** cm

☒ **C** m

☒ **D** km