Oxford Cambridge and RSA

GCSE Physics A (Gateway)

J249/04 Physics A P5-P8 and P9 (Higher Tier)

Question Set 5

1 A scientist uses different drivers to test the stopping distances of the same car.

Look at the results.

Driver	Speed (m/s)	Thinking distance (m)	Braking distance (m)
A	8	6	6
B	16	13	24
C	32	24	96
D	16	12	24
E	8	5	6
F	32	30	120

(a) Most of the drivers tested the car on a dry day, on a level road.

Which driver tested the car on an **icy** road?

Driver ..... tested the car on an **icy** road.

[1]

(b) Which driver has the **quickest** reaction time?

Driver ..... has the **quickest** reaction time.

Calculate their reaction time.

Answer = ... s

[3]

(c) Give **two** drivers that have the **same** reaction time.

Drivers ..... have the **same** reaction time.

Explain your answer.

[2]

(d) Driver **C** travels at 32 m/s on the road and then stops. The car has a mass of 1200 kg.

(i) Show that the **kinetic energy** stored by the car at 32 m/s is approximately 614000 J.

[2]

(ii) Describe what happens to the kinetic energy of the car as it brakes and stops.

[2]

(iii) The braking distance of the car is 96 m.

Calculate the **braking force** on the car. Give your answer to **4** significant figures.

Answer ..... [3]

[3]

(e) Driver **B** travels at 16 m / s on the road. The thinking distance is 13 m and the braking distance is 24 m.

Driver **B** now drives the car **uphill** at the same speed on the same road.

How will driving the car **uphill** affect thinking, braking and stopping distances?

The reaction time will stay the same.

Complete the sentences.

The **thinking** distance will .....

The **braking** distance will .....

The **stopping** distance will .....

[2]

Total Marks for Question Set 5: 15