Name: _____

Stopping distances

Questions

Date:

Time:

Total marks available:

Total marks achieved: _____

Questions

Q1.

* A car, travelling at 20 m/s, with just the driver inside takes 70 m to stop in an emergency. The same car is then fully loaded with luggage and passengers as well as the driver.

Explain why it will take a different distance to stop in an emergency from the same speed.

(6)

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Q2.

(a) Which of these situations can increase the reaction time of a driver?

Put a cross (☒) in the box next to your answer.

(1)

☒ **A** an icy road

☒ **B** worn tyres on his car

☒ **C** stopping for a cup of coffee

☒ **D** driving for a long time without taking a break

(b) (i) A car engine produces an average driving force of 1200 N.

The car travels 8.0 m.

Calculate the work done by the force over this distance.

(2)

work done = ... J

(ii) The car has a mass of 1400 kg and travels at a velocity of 25 m/s.

Calculate the kinetic energy of the car.

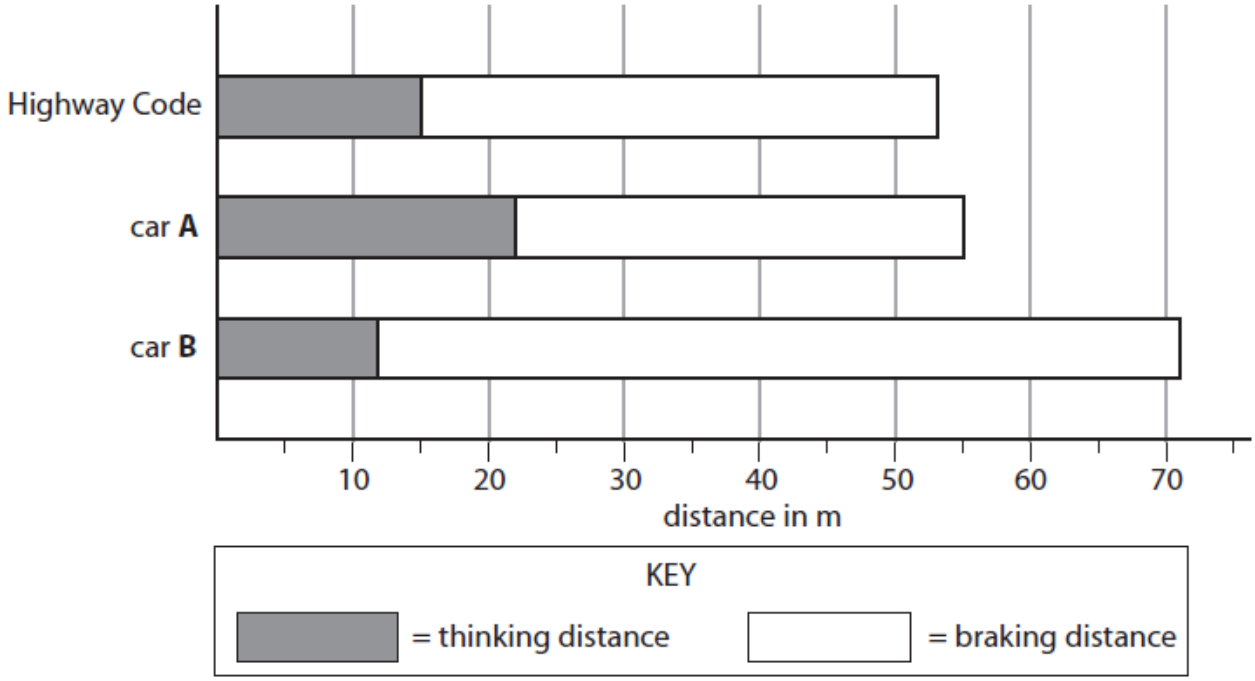
(3)

kinetic energy = ... J

Q3.

* The chart shows the thinking, braking and stopping distances for an average car and driver stopping from 50 miles per hour as shown in the Highway Code.

It also shows the thinking, braking and stopping distances for drivers of cars **A** and **B**, both stopping from 50 miles per hour.



A and **B** are different cars on different roads.

Use the factors that can affect thinking and braking distances to explain the differences in

stopping distances for cars **A** and **B**.

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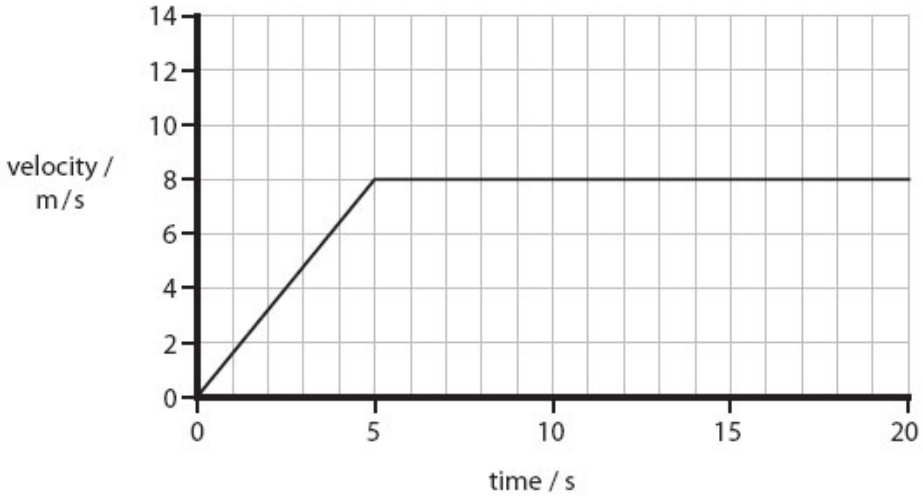
Q4.

(a) Here is the velocity-time graph for a car for the first 20 s of a journey.



(i) Calculate the change in velocity of the car during the first 5 s.

(1)

change in velocity = ...m/s

(ii) Calculate the acceleration of the car during the first 5 s.

(2)

acceleration = ...m/s^2

(iii) State the size of the resultant force between 10 s and 15 s

(1)

resultant force = ...N

(b) The mass of a car is 1200 kg.

Calculate the resultant force on the car required to produce an acceleration of 0.8 m/s^2.

(2)

resultant force = ...N

*(c) A car, travelling at 20 m/s, with just the driver inside takes 70 m to stop in an emergency. The same car is then fully loaded with luggage and passengers as well as the driver.

Explain why it will take a different distance to stop in an emergency from the same speed.

(6)

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(Total for Question = 12 marks)