2 The variation with time t of velocity v of a car is shown in Fig. 2.1.

For Examiner's Use

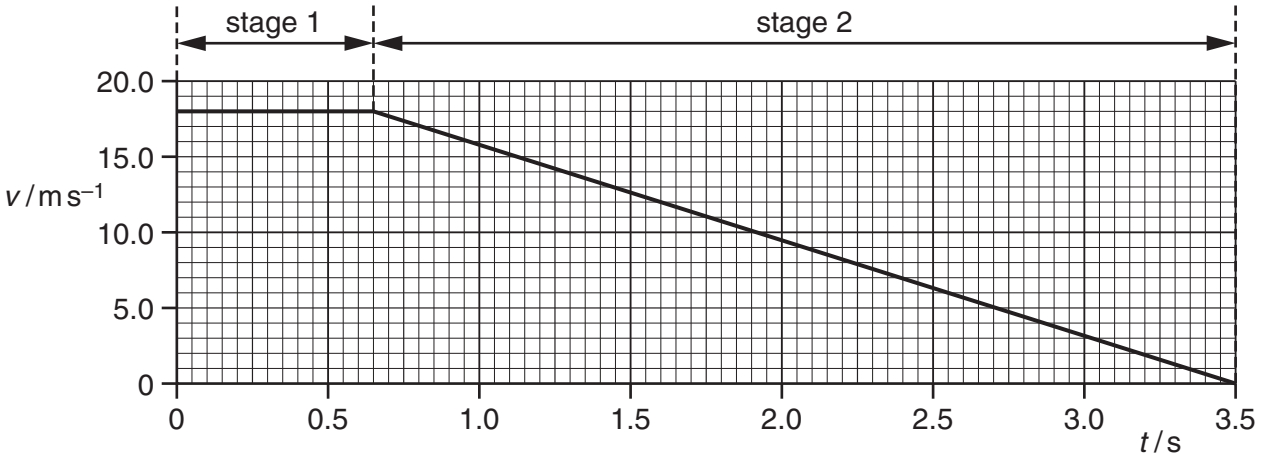

Fig. 2.1

At time $t = 0$, the driver sees an obstacle in the road. A short time later, the driver applies the brakes. The car travels in two stages, as shown in Fig. 2.1.

(a) Use Fig. 2.1 to describe the velocity of the car in

1. stage 1,

.....

.....[1]

2. stage 2.

.....

.....[1]

(b) **(i)** Calculate the distance travelled by the car from $t = 0$ to $t = 3.5$ s.

total distance = ... m [2]

(ii) The car has a total mass of 1250 kg. Determine the total resistive force acting on the car in stage 2.

For Examiner's Use

force = ... N [3]

(c) For safety reasons drivers are asked to travel at lower speeds. For each stage, describe and explain the effect on the distance travelled for the same car and driver travelling at half the initial speed shown in Fig. 2.1.

(i) stage 1:

.....

.....

.....[1]

(ii) stage 2:

.....

.....

.....

.....[2]