MOTION-SET-1-QP-MS

1(a) A motor manufacturer is testing his new electric car.

The driver is given instructions on how to drive over a set distance on a special test track, as shown in Fig. 5.1.

Poles are placed 10 m apart and a photograph of the position of the car is taken every second.

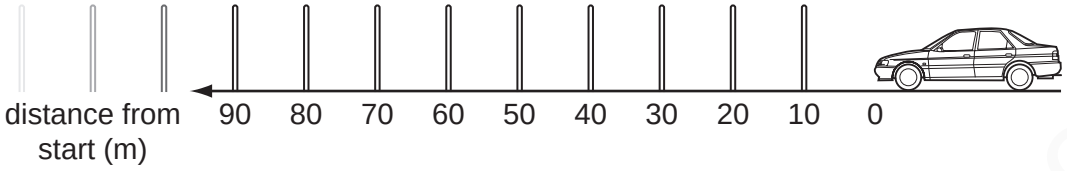


Fig. 5.1

The distances for one test run are recorded in Table 5.1.

Table 5.1

time / s	0	1	2	3	4	5	6	7	8	9	10
distance / m	0	8	18	34	52		99		161	199	239

(i) Use Fig. 5.2 to record in Table 5.1 the distances travelled after 5 and 7 seconds.

Take your measurement from the front of the car. [2]

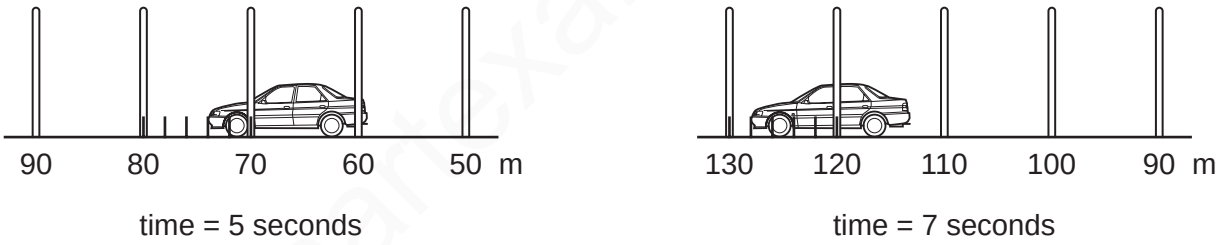
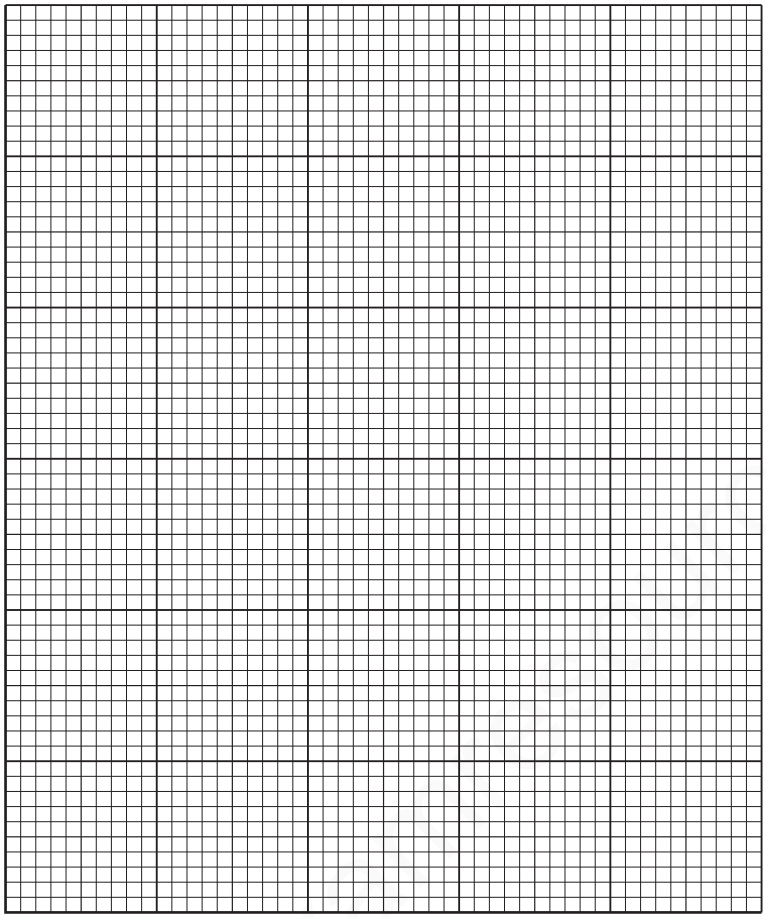


Fig. 5.2

(ii) On the grid provided plot a graph of distance / m (vertical axis) against time / s.

Draw a smooth curve of best fit.



[3]

(iii) Explain what the shape of the graph tells you about the motion of the car.

.....

[1]

(iv) Calculate the average speed of the car over the first six seconds.

.....

.....

[1]

Fig. 5.3 shows sketch graphs of 3 more tests runs.

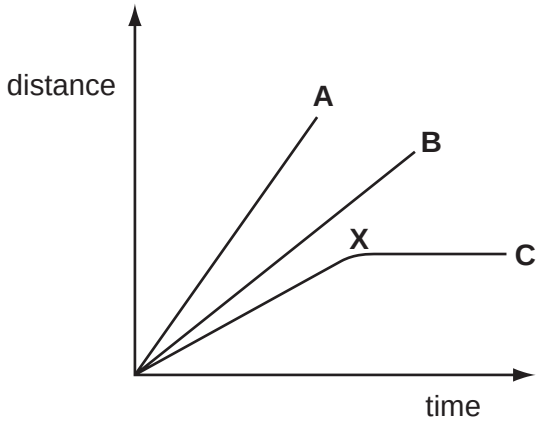


Fig. 5.3

(b) (i) State in what ways test runs **A** and **B** are similar and different.

similar .....

.....

different .....

..... [2]

(ii) Suggest what may have happened at point **X** in test run **C**.

.....

..... [1]

MARKING SCHEME

(a) (i) 74 ;
128 ; [2]

(ii) scales linear and labelled ;
points ;
smooth curve ; [3]

(iii) speeds up / accelerates ; [1]

(iv) (99 ÷ 6) = 16.5 (m / s) ; [1]

(b) (i) *similar*. constant speed ;
different **A** is faster than **B** ; [2]

(ii) it stops / crashed / engine failure (**not** run out of petrol) ; [1]

[Total: 10]