1 Fig. 1.1 shows a model car moving clockwise around a horizontal circular track.

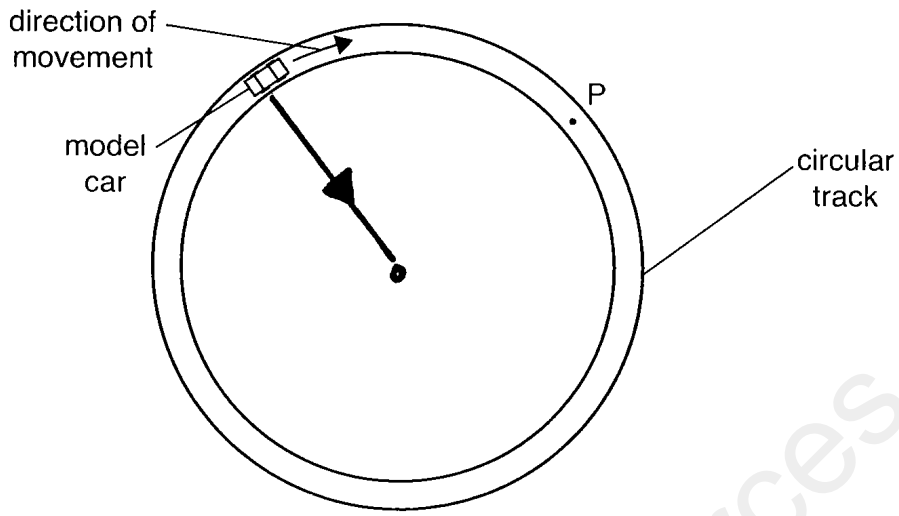

Fig. 1.1

(a) A force acts on the car to keep it moving in a circle.

(i) Draw an arrow on Fig. 1.1 to show the direction of this force. [1]

(ii) The speed of the car increases. State what happens to the magnitude of this force.

The force becomes larger

(b) **(i)** The car travels too quickly and leaves the track at P. On Fig. 1.1, draw an arrow to show the direction of travel after it has left the track. [1]

(ii) In terms of the forces acting on the car, suggest why it left the track at P.

The car remains in the track because of the centripetal force provided by the friction between the track and the tyres. Since the friction is too small so the car leaves the track

(c) The car, starting from rest, completes one lap of the track in 10s. Its motion is shown graphically in Fig. 1.2.

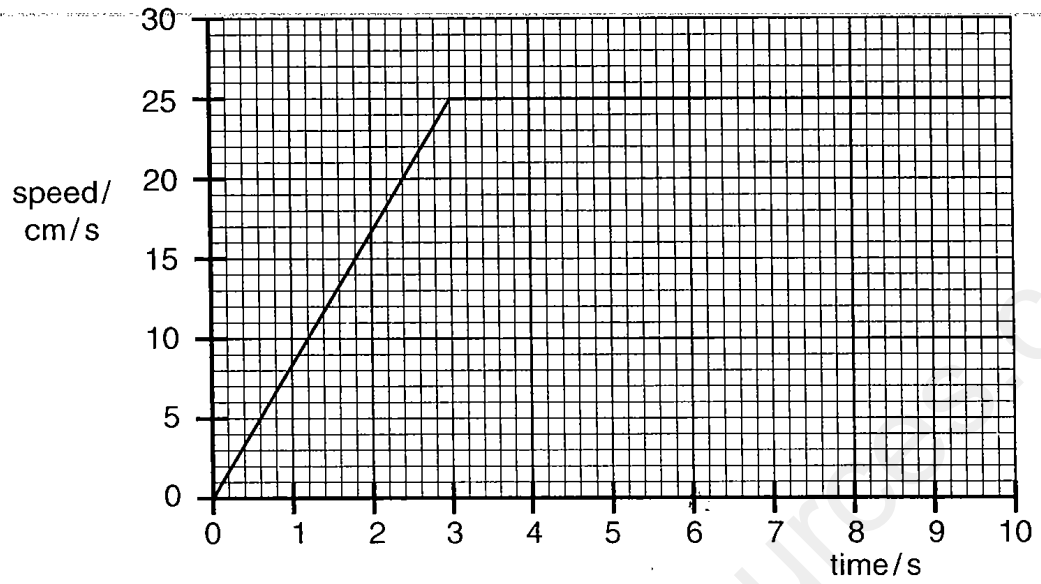

Fig. 1.2

(i) Describe the motion between 3.0s and 10.0s after the car has started.

The car has a constant speed or constant velocity. It moves with a uniform motion and has zero acceleration

(ii) Use Fig. 1.2 to calculate the circumference of the track.

Circumference of the track= Area under the graph=A(Triangle) +A(Recatnagle) = [1/2 X (3X 25)] + (7X 25)] = 212.5 cm

(iii) Calculate the increase in speed per second during the time 0 to 3.0s.

time= 3 s speed = 25cm/s
time= 1 s speed= x
So;
3x= 25cm/s
x= 25/3cm/s
=8.33cm/s