2

Fig. 2.1 shows a skateboarder of mass 55 kg about to descend a curved ramp in a skate park.
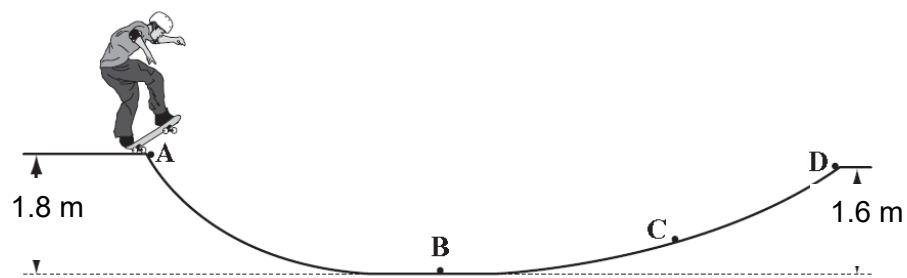

Fig. 2.1

(a)

State at which of the points along the track, **A**, **B**, **C** or **D**, the magnitude of the acceleration is the greatest.

……………………………………………………………………………………………..

[1]

(b)

The skateboarder is initially at rest. Assuming that there is no frictional force acting from **A** to **B**, calculate the speed the skateboarder would have at **B**.

speed = ………………………… m s^{-1}

[2]

(c)

The skateboarder has just enough energy to reach **D** because of friction along **B** to **D**. The length of the track between **B** and **D** is 8.5 m.

Calculate

(i)

the energy lost due to friction as the skateboarder moves from **A** to **D**,

energy lost = ……………………… J

[2]

(ii)

the magnitude of the average frictional force from **B** to **D**.

average frictional force = …………………………. N

[2]